Explaining the 'Yuck factor':

The Relationship between Anomia and Public Support for

Technological Change in the Netherlands

Abstract:

This paper explores the phenomenon of the 'Yuck factor', or that people who are not informed or aware about a new technology, are likely to reject it, this is important as it can harm technological development. The paper attempts to propose an alternative to existing explanations of 'Yuck' that often dismiss it as intuition. It does this, using multiple regression and (partial) correlations to establish the main relationships between variables. Even though its composition differs greatly from previous research, this dataset supports the existence of a 'Yuck factor' in the Netherlands. It is found that a highly educated public is more likely to be more aware, which leads them to value the positive sides of a new technology more than the negative. The negative association found between gender role traditionalism and awareness, is hypothesized to be because of the selection of media outlets, where news selection based on existing values reinforces these values. A similar (negative) relationship was found between awareness and anomia, where additional correlations revealed a picture of the anomic individual using media as an escape. Finally, controlling for gender role traditionalism did not cause the interaction effect of religiosity and awareness to become no longer significant. Anomia however did and could be used to explain why people, when they do not know about a new technology, regardless of cultural predispositions, do not accept it.

Key Words: Anomia, Gender Role Traditionalism, Yuck factor, Public support for Technology, Netherlands

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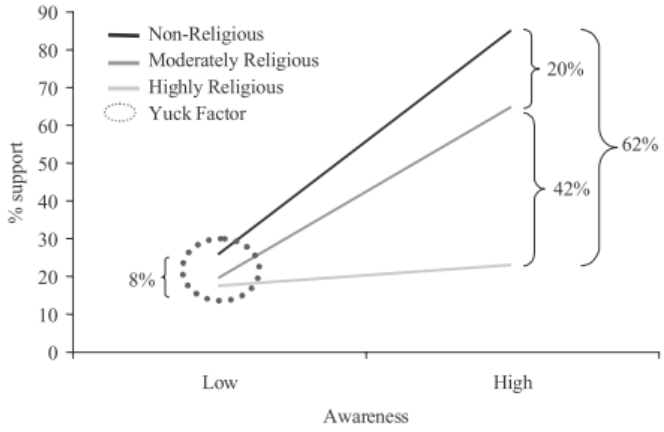
The Relationship between Anomia and Public Support for Technological Change in the Netherlands

1 Introduction

Since bioethicist Arthur Caplan of the University of Pennsylvania named it, much research has been done into how the 'Yuck factor' has affected some of the most well-known advances in technology, ranging from recycled waste-water to stem-cell research, genetically modified crops and nanotechnology. The 'Yuck factor' describes 'technophobic sentiments' against new technology (Schmidt, 2008: 525) and is located at the start of the 'Yuck' curve (see *encircled*). The 'Yuck' curve shows that public support for new technology increases when awareness of such technology is higher. Conversely, when awareness is low, the public is less likely to show support for such technology, thus resulting in technophobic responses (hence the name, 'Yuck factor').

Figure I: 'Yuck' curve (in Nisbet, 2005:104)



Nisbet (2005, see Figure I) found that certain cultural predispositions, such as religiosity or ideology, may affect this general trend. To elaborate, Nisbet (2005, see Figure I), at low levels of awareness, reports a difference in public support for technology between liberals and conservatives of 5%, while for non-religious and those that are highly religious this difference is 8%. This is only minor compared to the same difference at high levels of awareness, where there is a difference in public support of 35% (in ideology) and 62% (in religiosity) (Nisbet, 2005:104-105). Thus, while at high levels of awareness public support for technology varies *greatly* by levels religiosity and ideological commitment. At low levels of awareness, religiosity and ideological commitment cause *little difference* in the amount of support for new technology, as a result all responses against new technology are dismissive, those of rejection or 'Yuck'. The 'Yuck factor' has thus become 'a catchall phrase to describe technophobic sentiments' against new technology (Schmidt, 2008: 525), in most academic literature involving 'living, biological creatures' (Fethe, 2000: 31)

To date the dismissive response or 'Yuck factor', as a result of low public support, has been explained in two ways. Both explanations of 'Yuck' point to why it is important to be able to explain what causes the 'Yuck factor', since the dismissive responses against new

technology (as a result of low public support and awareness), can significantly harm the acceptance of new technology and in turn its development (Kulinowski, 2004; Schmidt, 2008: 525). While Kulinowski uses nanotechnology, such as in GM (genetically modified) food, to illustrate this point, the authors named here, Kass and Niemelä, explain 'Yuck' in relation to another technology: that of cloning. I separate these authors into two streams of thought. The explanations of 'Yuck' by Kass and Niemelä, however, can also be seen as very similar, in that they focus on the *emotional response of disgust*, to new technology, caused by and as a result of *intuition*.

Since both explanations for 'Yuck', by Kass (1998) and Niemelä (2011), refer to *intuition* as the cause of the emotional response of disgust, it seems as if the 'Yuck factor' is an almost law-like, unchangeable condition. This may however, not be the case. As Kulinowski's (2004) writing indicates, involvement of the public (next to the existing involvement of industry, university and the state) in the process of technological development and change, leads to greater acceptance (and, in turn, less 'Yuck'). Negative emotions like disgust are thus not as unchangeable as they seem. Russel & Lux (2009: 30) too, conclude that there is no evidence that negative reactions to new technologies are fixed.

Within the second stream of thought, it is also recognized by Niemelä (2011:274) and Schmidt (2008: 526), in fact undermining their own argument, that there are differences between cultures in what evokes disgust. Their fixed conceptualization of 'Yuck' as intuition can for instance, not explain why the eating dog and horse meat, was banned in California (by referendum), while in Asia and Africa, such meat 'routinely wind up on the dinner table' (Schmidt, 2008: 526). Finally, these authors have portrayed the 'Yuck factor' as a single possible response. Yet, 'Yuck' may not be the only response to new technology: authors such as Kulinowski (2004) and Smits (2006) indicate that there are more responses than just disgust. These authors argue that the response to new technology may be one of disgust ('Yuck') *or* a positive response, such as amazement and awe ('Wow'). This once again highlights the flaws in positing 'Yuck' as an intuitive, law-like and unchangeable response.

To summarize the above, it is found that regardless of certain cultural predispositions (ideology, religiosity), people that are not aware of new technology will reject such technology (Nisbet, 2005). In addition, it is found that this so-called 'Yuck factor' is not likely to be an intuitive response to such new technology (and thus by nature unchangeable) as authors like Niemelä (2011) and Kass (1998) have made it seem. This calls for an alternative

explanation for the 'Yuck factor', resulting in the question: *'How can we explain that at low levels of awareness, regardless of cultural predispositions, new technology is always rejected?'*

An attempt is made to answer this question in the following way. First, the arguments of Niemelä (2011) and Kass (1998) are evaluated, and an alternative explanation is sought to explain their findings, in terms of *gender role traditionalism.* This is followed (in the same section), by an explanation of the relationship of gender role traditionalism to education and awareness, linking it to public support for technology. The second explanation for 'Yuck' is derived through the feelings of cultural anxiety from the 'Yuck' literature, which are ultimately related to the concept of *anomia*. This results in several hypotheses, which are then tested in a multiple regression, as described in the methods section. The paper continues by presenting the results and finally, provides a conclusion and discussion.

2 A Sociological Alternative to Intuition

2.1 Gender Role Traditionalism, Awareness and Support

According to Kass (1998) the intuitive reaction of disgust evoked by new technology is in fact a 'deep wisdom' that cannot be explained through reason. The author believes that such disgust should not be dismissed just because one cannot fully justify it and should be taken as a valid argument to base 'ethical and political' decisions on (Niemelä, 2011: 267). Kass names this the 'wisdom of repugnance' and as dangerous as dismissing an argument on the basis of an emotional or intuitive response of disgust may be[1], he sees this involuntary and emotional reaction as a last defense, against what we could summarize as the encroachment of technology onto humanity and the human body.

While Niemelä (2011) too explains 'Yuck' as an intuitive response, the author attempts to dig deeper into how such dismissive responses are evoked and provides with two explanations. Niemelä (2011), when looking at public support for technology (of cloning), argues that when rules for making sense of the world (folk biological and psychological

[1] Niemelä (2011: 268) initially attempts to supplement the existing critique to Kass (1998) that has, amongst others, pointed to the dangers of how popular revulsion has fueled prejudice. Specifically, Nussbaum is mentioned, who argues that much prejudice that has been driven by popular revulsion, as well as Harris and Gould, who argue that there is a difference between a well-formulated 'ethical principle' and an 'unconscious reaction of disgust'.

essentialist reasoning[2]) are transgressed, an intuitive, emotional response of disgust is evoked. Specifically, the author uses three examples. These examples are briefly listed before an alternative explanation is presented. The first example involves the violation of parenthood stereotypes: for the technology of cloning there is no second parent needed since the child will be a clone and according to the author this elicits disgust (Niemelä, 2011: 275-278). The second example presented is the production of offspring through sexual interaction, which in the case of the technology of cloning is no longer necessary, once again evoking disgust (2011: 275-278). In the third and final argument by Niemelä (276-277), it is argued that what is lost in cloning is that what makes a human, human. This is an argument also found in Kass, who presents the example of the randomness in procreation (i.e. genetic variation), that may be damaged or lost.

Each of these examples however, could be argued to be *value predispositions* in the form of *traditionalist gender roles*, explicitly requiring the need for two parents of opposite sexes. At the same time however, rephrasing this argument in terms of value predispositions opens the door to alternative explanations of the 'Yuck factor' from the field of sociology. Since in the preliminary material (i.e. Figure I, above), awareness is shown to be a predictor of public support, this may be a good starting point. Research has shown that education is a strong predictor of awareness and in turn, public support of technology (Pardo et al., 2002: 22; de Keere, 2010: 40-41). A highly educated public is more likely to be more informed and/or aware which in turn leads them to value the positive sides of technology higher than the negative (Pardo et al., 2002: 22) Similarly, the continuation of education shifts gender-role attitudes in a more egalitarian direction (Fan & Marini, 2000 :277). A higher educated and thus more aware, as well as less gender role traditionalist public, will show less 'Yuck' (or in other words more support for a technology). In the same way, those that are less educated and thus more gender role traditionalist, as well as less aware, will show more 'Yuck' (in other words, less support for a new technology).

Yet, while it is understandable that a negative relationship between awareness and gender role traditionalism should be found, an explanation has yet to be presented. This is hypothesized to be because of the selection of media outlets, where news selection based on

[2] These types of reasoning have developed in humans to make sense of (new) things, such as technology, much more rapidly (Niemelä, 2011:273). In a broader sense, one could explain folk biology as a quick way of organizing new things into categories (i.e. taxonomy), especially when related to the biological world. Essentialism then assigns certain invisible 'core property' to items that find themselves in a specific category (Niemelä, 2011:272).

existing values reinforces these values. Thus, it is argued that existing *gender role traditionalism,* that could be transferred through parents (Whitbeck & Gecas, 1988) or mass media (Nisbet, 2005: 91), influences the media outlets an individual selects. Since some media outlets will frame technology as more, or less harmful, obscuring other elements of the story (Entman, 1993), it is expected that a more gender role traditionalist (as any) audience selects information from those media outlets that frame aspects of reality that appeal to him/her most, thus reinforcing their opinion (Arnett, 1995: 529). This explanation also fits well with Nisbet (2005: 91) who explains that support for technology on the basis of attitudes, is often not a well informed decision, where 'individuals rely primarily on their existing value predispositions and only the information most readily available to them from the mass media in order to formulate an opinion about complex and remote policy disputes' (Nisbet, 2005: 91).

2.2 Anomia, an 'Acute disjunction'

A recurring theme throughout the 'Yuck' literature are feelings of cultural anxiety. These feelings are a starting point to an alternative theory to gender role traditionalism, that may be used to explain the 'Yuck factor' from the domain of sociology. Kass (1998: 687) for instance when arguing against cloning states that 'many people feel oppressed by the sense that there is probably nothing we can do to prevent it ('man playing God') from happening'. Niemelä (2011: 275) too speaks of ' ...feelings of strangeness and threat'. Together these arguments point to the anomic condition. To draw a distinction between anomie and anomia, *anomie* refers to the 'state of society' as described by Durkheim. Later Merton, as well as Srole use the term *anomia* to 'refer to an individual state of mind'. Deflem (1989: 631), here, argues it has not yet been established to what extent they 'are related to one another'. According to Deflem (1989: 632), Merton argues that one may use the 'proportion of anomic individuals' to determine the 'degree of anomie of that society'. Srole however, sees 'their relationship as reciprocal'. Srole (1956: 712) uses two fitting definitions of anomia, the first by MacIver is 'the breakdown of the individual's sense of attachment to society', while the second is by Lasswell who defines anomie as 'lack of identification on the part of the primary ego of the individual with a 'self' that includes others. In a word, modern man appeared to be suffering from psychic isolation. He felt alone, cut off, unwanted, unloved, unvalued'. Merton sees anomie as the (Merton in Deflem, 1989: 631) 'breakdown in the cultural structure, occurring *particularly when* there is an acute disjunction between the cultural norms and the socially structured capacities of members of the group to act in accord with them'. This 'acute

disjunction' becomes apparent when Merton associates a public with low level of education and little economic resources as striving to achieve wealth (as culture demands), while institutionally, 'largely denied effective opportunities to do so' (where he refers to the American public) (Merton, 1938: 674, 679). Similarly in the Springfield study by Srole (1956) anomia was associated with low levels of socio economic status, as measured by level of education. Research other than Srole's (1956), also shows a similar negative relationship between anomia and level of education[3].

There are thus two directions that affect anomia: low education can be associated with insufficient *economic* or *cultural* resources. This economic and/or cultural deprivation, in turn, causes anomia. We may reason that an anomic individual may find new technology as the cause of the disjuncture between what he/she desires (order) and what they perceive in society (chaos), a process of technological development and change which is difficult to get involved in. Less educated individuals are thus expected to be more anomic, which causes them to show less support for new technology (or more 'Yuck').

Since it was already argued that a highly educated public, that is more aware, attaches more value to the positive sides of technology than the negative. One may ask oneself if the reverse holds true. Would lower educated, less aware, anomic individuals, give more credit to the negative sides of such technology than to the positive? While this may seem absurd, Popkin and Dimock (in Sturgis & Allum, 2004) 'observe that respondents with low levels of political knowledge tend to see political scandal as much more serious than those with higher levels of political knowledge and understanding'. Thus, those not as knowledgeable of politics are more likely to value scandal as an argument. Less educated individuals are thus expected to be less aware and in turn show less support for new technology (or again, more 'Yuck'). This however also means that those that are more educated and especially, more aware, are less likely to value scandal relating to such new technology.

This explanation lacks the reason for the relationship between anomia and awareness. It is argued that because anomic individual have trouble living up to the cultural norm, lacking the institutional means to do so (here, education), media could be used as an 'escape',

[3] In terms of life goals (Meier & Bell, 1959), anomic neighborhoods (Bell, 1957), sex-segregated college attendance of (Christian) women (Wassef, 1967: 237), race (Middleton, 1963: 976), where it is found that the individual items relating to the Srole scale are significantly higher for both whites and blacks if they have had less than 12 years of education, urbanism and race (Killian and Grigg, 1962: 663). In more recent studies similar relationships have been encountered (Ryan, 1981: 646; Hays, Regoli, and Hewitt, 2007: 12; Brashears, 2010:192; Liqun Cao et al., 2010: 635).

to get away from the 'constraints of routine and the burdens of problems, and emotional release' (McQuail et al. in Nightingale & Ross, 2003). This seems to be a particularly suitable explanation, since the anomic individual has much to get away from and this would likely also be reflected in the choice of media. For instance, it is likely that less value is attached to informational media and more value to a medium that has a higher degree of entertainment value. The selection of such a (less informational) medium could in turn reinforce the existing values of the anomic individual (Arnett, 1995: 529).

2.3 Summary and Hypotheses

In short, if the 'Yuck factor' exists an interaction effect should be found of religiosity on the relationship between awareness and public support for technology (H1), while this is a prerequisite, this relationship has been found in numerous other research and such a finding would not be considered extraordinary[4]. Here, one should expect that at low levels of awareness, public support of technology, regardless of value predispositions, is low. In other words, if people are not informed or aware about a new technology, they are likely to reject it regardless of cultural predispositions. Similarly, a highly educated public is more likely to be more informed and/or aware (H2), which leads them to value the positive sides of a new technology higher than the negative. A negative association should also be observed between gender role traditionalism and awareness (H3). This effect is based on the selection of media outlets, depending on education (more progressive outlets) and, for instance, parental value transmission (progressive or conservative), the news selection based on these existing values would then reinforce already existing values. A similar (negative) relationship should also be found between awareness and anomia (H4). Anomic individuals feel as if they are unable to live up to a cultural norm (i.e. wealth), because they do not have the institutional means to do so (here, education). This and their dystopic frame of the world suggests that media could be used as an 'escape'. An anomic individual would thus attach less value to those outlets that are more informational. Finally, controlling for gender role traditionalism (H5) and anomia (H6) one should find that the 'Yuck factor' disappears, explaining why lower educated, less aware people, when they do not know about a new technology, regardless of cultural predispositions, do not accept it.

[4] I.e. Nisbet (2005)

3. Methods

3.1 Subjects and sample

In order to test the hypotheses the first wave of the NELLS (Netherlands Longitudinal Lifecourse Study) data was used (De Graaf et al., 2010). This resulted in a large sample (N = 5,312, of whom '2,335 minorities and 2,977 others') (2010: 8). In order to 'adjust for the deviations by sex, age, region and urbanization' weights were applied (2010: 9). The ethnic groups in the sample were categorized as 'Moroccan first generation', 'Moroccan second generation', 'Turkish first generation', 'Turkish second generation', 'Non-Western first generation', 'Non-Western second generation', 'Western first generation', 'Western second generation', and 'Dutch origin ('autochtoon')'[5] (2010:10). In the sample slightly less males (47.2 percent) were present than females (52.8 percent), the national percentage for 2010 lies relatively close to these numbers, with slightly more females (50.51 percent) than males (49.49 percent) (CBS Statline, 2011). The age of the participants ranged from 15-45. This age group should provide a sample of citizens that have experienced new technologies as they were introduced: while cloning is an idea that became more prominent from the 1960s, widespread genetic modification is a much more recent development and the oldest participants would have been around 15 years of age as it was introduced to the world (start of the 80s). Thus, while younger participants were born into a world where some of this technology was accepted, other, older participants lived to see the debate around such technology, before it was adapted on a wide scale. Lastly, picking the Netherlands, as it is considered a more secular country, should also provide a stringent test to the interaction effect of religion on the relationship between awareness and public support. The exception to this is however the large Muslim population, a way in which this dataset greatly differs from the VCU life sciences survey used by Nisbet[6].

[5] 'Western origin refers to all European countries (excluding Turkey), US, Canada, Pacific (mainly Australia and New Zealand), Japan and Indonesia (including Dutch Indonesia; the former Dutch colony). All other countries, including Aruba, the Dutch Antilles and Suriname are considered non-Western' (De Graaf et al., 2010: 10).

[6] A difference in religion that will be tested in the results section. According to Larijani and Zahedi (2004: 3189), Islam's view on stem cell research and (human) cloning, is that abortion is much like Christianity, a sin, however much like certain Christians have different interpretations, in Islam there are exceptions to the rule: 'abortion is permissible in Islam before the end of the fourth month of pregnancy when there is a physical or emotional necessity involved, like a life-threatening danger for the mother or a high possibility of severe fetal anomalies. Therefore, based on majority of Islamic scholars, the use of embryo for therapeutic or research purposes may be acceptable under necessity if it takes place before the point at which the embryo is ensouled' (Larijani & Zahedi, 2004: 3189).

3.2 Design and apparatus

The sample is a 'two stage stratified sample'. The first stage is a 'quasi-random selection of 35 municipalities by region and urbanization'. The second stage is 'a random selection from the population registry based on age and country of birth of the respondent and his/her parents', where 'people of Moroccan and Turkish origin were oversampled' (De Graaf et al., 2010: 5). The data was than collected through (mixed mode) face to face interview, as well as self-completion questionnaires. A pretest was also conducted among '100 Turks, 100 Moroccans and 100 other inhabitants of the Netherlands' (2010: 7).

3.3 Operationalization of variables

In order to test our hypothesis the following variables were constructed, they will be discussed in the order in which they will be treated. The exact questions can be found in the appendix (see Appendix, Table I).

Awareness

Awareness is a measure of informedness and hence was constructed out of a newspaper reading variable (5 categories) and an information-, news- or support group online reading variable (7 categories). The latter was than reverse coded to suit the new index (i.e. more news viewing is more aware). Both variables were standardized and the mean was taken in order to construct the new awareness index. The inter-correlation of this index was poor, $r(4479) = .21$, $p < .01$. It was still chosen to include the online news reading variable as the internet is catching up on traditional news sources, such as newspapers (Hoksbergen, 2009). While the dataset does not include variables that ask for specific awareness of, for example, stem cell research, one must assume that someone who is exposed to more news is also more likely to be exposed to (more) information about such technology (Besley and Shanahan, 2005)[7].

[7] Besley and Shanahan (2005), present the relationship between of television news viewing and agricultural biotechnology support, however the argument is that in the Netherlands it was reported that most people spend 'on average half an hour a day', reading at least one newspaper (Midden et al. in Durant, Bauer and Gaskell, 1998: 105). The newspapers with the largest circulation in the Netherlands all have a science section and earlier analyses report that for the Volkskrant from 1977 on, a half page column was dedicated to scientific issues, which has grown to become a full section since (1998: 106). Midden et al. (in Durant, Bauer and Gaskell, 1998: 106), counted 1,119 articles during the period of 1973 to 1996.

Public support for technology

The public support for technology variable consists of a scale made up of four questions. These questions, with four answering categories ranging from 'never wrong' to 'always wrong', each determine to what extent a new technology is considered 'wrong' to the respondent. The technologies in question are: artificial insemination; selection of embryos on the basis of hereditary disease; cloning of animals and the genetic manipulation of food. This variable required no recoding or standardization and the scale's reliability was satisfactory ($\alpha = .72$), which is why it was constructed into a scale by using the mean. The VCU (Virginia Commonwealth University) Life Sciences Survey seems to contain similar questions, but it remains unclear whether Nisbet (2005) has also used these questions for the measure of public support for technology.

Religiosity

For the religiosity item, we partially follow Nisbet (2005)[8] in using the importance of faith (5 categories) to the respondent, ranging from 'not important at all' to 'very important', this is then combined with the number of visits to places of religious worship (7 categories), which ranges from 'Never' to 'multiple times every week'. Without the importance of faith variable, the number of church visit cannot determine sufficiently how religious one is. The importance of faith item was than reverse coded. The index's reliability was fair, $r(4819) = .54$, $p < .01$. Both questions were standardized, after which the mean was taken to form a religiosity index.

Education

Education in the NELLS data was measured by asking whether the participant had successfully completed a program with a diploma. Thus fourteen questions based on different education levels are listed in the dataset with a dichotomous 'yes' or 'no' answer. Since these questions also involved foreign education that was impossible to classify, it was not possible to construct a differentiated version of education. Instead, it was chosen to construct a variable on the basis of a broader classification, namely, primary, secondary and tertiary education (as foreign education was classified on the basis of this broader classification). The variable was coded from zero, no education, to three, tertiary education. A preliminary

[8] Due to the large amount of Christians in the VCULife Sciences Survey Nisbet (2005) uses 'doctrinal conservatism', an item we cannot use due to the large amount of Muslims in our dataset (the item measures 'the degree to which the individual subscribes to a literal interpretation of biblical scripture'.

correlation showed that this variable to be about as strongly correlated with other variables in this study as the more differentiated, but less reliable variable (since foreign education could not be classified as a level this would make the variable less reliable). In order to get from these dichotomous ('achieved diploma') answers to the education variable each level of education was multiplied by a number, so that a certain range of numbers would correspond to a certain level of education. These ranges could then be recoded into an education scale from zero to three, without losing missing cases in the process.

Gender role Traditionalism

Gender role traditionalism was measured with a scale of four questions about gender equality in: taking care of a baby; household tasks; raising children and caring for children. These variables were coded from one, 'Strongly agree' to five, 'Strongly disagree'. Only the household tasks question was reverse coded. The scale's reliability was reasonable ($\alpha = .64$), yet removing any of the items showed no improvement. The means were taken to produce a scale.

Anomia

The included anomia items are almost identical to Srole's hypothesized elements of Anomia (5 categories), making them an excellent measure for such a scale (Srole, 1956: 712). These variables were coded from one, 'Strongly agree' to five, 'Strongly disagree'. All items were reverse coded and using the mean a scale was constructed. The scale's reliability was good ($\alpha = .80$).

Additional coding

Since the purpose was to produce a somewhat reliable measurement for each scale, it was chosen to have SPSS calculate a value for these scales if there were at least two values present (thus two questions had been answered, as the normal mean function only requires one). This means that on scales where there was only one question answered the result would be coded by SPSS as missing. This was only done for scales that were built up out of more than two questions, which are: Gender Role Traditionalism, Anomia and Public support for technology[9].

[9] This resulted in three extra missing cases for Gender Role Traditionalism, three extra cases for Anomia and nine extra cases for support of technology.

3.4 Procedure

In order to test each hypothesis a multiple regression as well as (partial) correlations have to be conducted. The assumptions for a correlation requires at least interval level data and a normal distribution of such data. Normality was checked and if violated necessary transformations were made[10]. The significance of correlations is tested using bivariate Pearson correlation coefficients and partial correlations (to control for other variables). One would expect that a correlation between education and awareness is significant ($p<.05$) and positive. For the awareness and gender role traditionalism, as well as awareness and anomia (where one expect a negative correlation) a control variable such as education should be introduced to see whether the relationship remains significant, showing that it is not just the influence of education on awareness that makes the effects significant, but that awareness in itself is also negatively associated with gender role traditionalism and anomia.

In order to test whether Muslims and Christians show similar results, a preliminary multiple regression should show whether the same effects are present and if not, if these differences can be explained. An independent samples t-test may be conducted to check for group differences, normality will be checked once more and if violated a logarithm is taken. If Levene's test is significant ($p<.05$), variances are significantly different, the other (t-test) significance value (under equal variances not assumed) will be checked and if found to be significant ($p<.05$), there is a significant difference between the means of the two samples. Also, in order to provide further support for the theory that anomic individuals tend to draw more towards less informational outlets than news, correlations may be conducted. It is expected to find a correlation between anomia and news reading that is smaller than that of anomia and using media for entertainment purposes.

Before any of the other hypothesis can be tested it needs to be established whether there is in fact a 'Yuck factor', this can be done through a regression analysis. First, the assumptions were checked and the regression weights introduced. The linear relationship between variables can be observed through a scatterplot of residuals to predicted values or a plot of the observed against the predicted values. For outliers in the model, outliers in X-space are checked by mahalanobis distance ($M>25$, $P < 0.001$) and in Y-space, by the cook's

[10] It would not be appropriate to use normality tests since the sample size is large (N = 4,874). Rather, if the skewness or kurtosis statistic are larger than the standard error of these statistics multiplied by two, it is likely that they deviate from a normal distribution. If it deviates from this number and positive skewness is found, a logarithm is taken, the resulting numbers can then be used in a correlation

distance (>1, P < 0.001), if necessary, these will be removed (Field, 2009: 218)[11]. The normal probability plot, as well as a histogram of the standardized residuals should show whether the error terms are normally distributed. Homoscedasticity can then be checked by plotting the standardized residuals against the standardized predicted values. To check if the error terms are independent of each other, the Durbin Watson test may be used, the value (between zero and four) two indicates that the residuals are uncorrelated[12]. Finally to check for multicollinearity the collinearity statistics such as tolerance and VIF may be examined[13]. For the tolerance statistic Menard (in Field, 2009: 224) suggests any value below 0.2 should cause one to worry. All of these numbers can be requested in the regression analysis conducted in SPSS Release 20.0.0.

Before starting the analysis, the variables involved in the interaction, religiosity and awareness, were centered to avoid problems with multicollinearity (Aiken and West, 1991: 32). These are then multiplied to create a new variable, the interaction term. In order to test whether the 'Yuck factor' exists in this dataset, the multiple regression will be run as three models (see Table I, coefficients, below). In the first model, to test the hypothesis that the 'Yuck factor' exists, only the centered variables religiosity and awareness, as well as the interaction term are added, plus age and sex, which serve as control variables. In model two, in addition to these five variables, gender role traditionalism is added, while in model three, anomia is also added, making a total of seven variables. The method selected for all models is (forced entry) enter, as there are good theoretical reasons for including the chosen predictors and we do not require SPSS to chose which predictors fit the model best. After checking for the assumptions above, the model summary may be checked for the R^2 and whether the change in explained variance between model one, two and three is significant by looking at the 'Sig. F change' ($p<.05$). The ANOVA table will show us whether each model "is significantly better at predicting the outcome than using the mean as a 'best guess'" (Field, 2009: 236). In model 1, the coefficients are important to determine whether the interaction effect of awareness and religion on public support is significant ($p<.05$) and what kind of effect other variables in the model will have on the dependent variable (by looking at the standardized B coefficients). Since the effects are calculated with the effects of all other

[11] Field (2009: 218) states that this is a rough value for large samples (N>500).
[12] A value close to two should suffice, higher values point to a negative and lower values than two, point to a positive correlation of residuals
[13] An average VIF greater than 1 may bias a regression model (Bowerman & Connell in Field, 2009: 224) and a value around 10 should make one worry (Myers in Field, 2009: 224).

predictors held constant, in order to check the final two hypothesis (model two and three) gender role traditionalism (model two and three) and anomia (model three only) have been added and one would expect that if gender role traditionalism and/or anomia is introduced, the interaction effect is no longer significant. In the results section I will first discuss the correlations, this is followed by the independent samples t-test, before moving on to the regression model.

Table I: Coefficients, Model I-III

Model		Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF
1	(Constant)	2.572	.035			
	Religiosity	-.312	.011	-.380*	.991	1.009
	Awareness	.086	.012	.093*	.963	1.039
	Interaction Effect Aware*Rel	-.042	.013	-.042*	.984	1.016
	sex	.045	.020	.030*	.972	1.029
	age at time of interview	-.007	.001	-.076*	.986	1.014
2	(Constant)	2.688	.046			
	Religiosity	-.302	.011	-.368*	.938	1.066
	Awareness	.081	.012	.087*	.952	1.050
	Interaction Effect Aware*Rel	-.041	.013	-.041*	.984	1.017
	sex	.058	.020	.039*	.949	1.053
	age at time of interview	-.006	.001	-.071*	.978	1.022
	GRT	-.067	.017	-.056*	.911	1.097
3	(Constant)	3.155	.057			
	Religiosity	-.277	.011	-.337*	.911	1.098
	Awareness	.058	.012	.063*	.935	1.070
	Interaction Effect Aware*Rel	-.024	.013	-.024	.975	1.026
	Sex	.056	.020	.037*	.949	1.053
	age at time of interview	-.006	.001	-.065*	.977	1.024
	GRT	-.053	.016	-.044*	.907	1.102
	Anomia	-.170	.013	-.179*	.929	1.076

a. Dependent Variable: Public Support

b. Weighted Least Squares Regression - Weighted by post strat. weight by ethnic group

* Significant at 0.05 level

M1, R^2 = .163**; M2, R^2 = .166**; M3,R^2 = .195**

N = 4874

4.0 Results

After checking the assumptions[14] the correlations (see Appendix, Table I) show that a highly educated public is more likely to be more informed and/or aware, $r(5224) = .25$, $p < .01$. It was argued that higher levels of education would cause one to attach more value to the positive sides of technology, in turn attaching less value to (political) scandal. An individual with less political knowledge on the other hand would attach more value to such scandal (Popkin and Dimock in Sturgis & Allum, 2004). The dataset also shows that one who is more aware, is less likely to have gender role traditionalist values, $r(4868) = -.09$, $p < .01$. This effect could be explained by the selection of media outlets, which by using these outlets, reinforces an existing opinion. Thus, a more highly educated public would choose more progressive outlets, reinforcing this (gender role) progressive opinion, whereas depending on the values your parents have transferred to you, you may choose more or less progressive outlets[15]. Finally, the effect of awareness on anomia is a negative one, $r(5310) = -.15$, $p < .01$. This is explained by one not being able (for reasons such as education) to live up to a cultural norm (i.e. wealth), such anomic individuals will use media as an escape from their condition. Thus, an anomic individual was thought to be more likely to use the internet, than a newspaper[16] and spend less time on the informational or news part of these media, the data provides evidence for this[17]. The data also shows this escapism in other ways: more anomic individuals use the internet less for news and more for entertainment[18]. Additionally, higher educated people use the internet more for news and less for entertainment, this also supports the escapism reasoning, as higher educated people are less anomic[19]. Now that these relationships have been explored, comparing whether Muslims and Christians show the same relationships is important, since unlike the VCU Life sciences survey, the NELLS data contains a substantial amount of Muslims. Even though the independent t-test shows that for news reading from the newspaper and that from the internet, the two variables that make up awareness, are

[14] Data is at least interval, but the variables education, gender role traditionalism and anomia are not normally distributed, they were transformed before being taken up into the correlations.
[15] As argued the effect remains significant upon control for education, $r(4803) = -.05$, $p < .01$, this means there is a unique part of effect of awareness on anomia, here this is explained as parental value transmission.
[16] As this allows for more freedom to choose between entertainment or news.
[17] Anomia and newspaper reading, , $r(4868) = -.15$, $p < .01$; Anomia and online news reading, $r(4478) = -.08$, $p < .01$.
[18] Anomia and online news, $r(4478) = -.08$, $p < .01$, while more for entrainment value anomia and online: chatting, $r(4461) = .05$, $p = .01$; games, $r(4480) = .08$, $p < .01$; gambling, $r(4478) = .05$, $p = .01$; music, $r(4476) = .04$, $p < .05$.
[19] Education and online news, $r(4450) = .16$, $p < .01$, while more for entrainment value education and online: chatting, $r(4461) = -.14$, $p < .01$; games, $r(4452) = -.16$, $p < .01$; gambling, $r(4450) = -.05$, $p < .01$; music, $r(4450) = -.12$, $p < .05$.

significantly different for Christians and Muslims[20], a separate regression points out that in all models awareness makes a significant contribution to the model[21]. Other variables too follow similar patterns, meaning that Muslims and Christians can be used together in a multiple regression.

In order to check for the remainder of the hypotheses, a multiple regression was conducted. This multiple regression was checked for assumptions and it was found that all assumptions had been met[22]. During the assumptions check however, multiple outliers in x-space were encountered and two of these were removed[23]. The model improves significantly at each step and each model is a significant fit to the data, as well as (significantly) better at predicting public support than the last[24]. A closer look at the coefficients of model one in Table I (above) reveals there is a 'Yuck factor' present in this dataset, as the interaction effect of awareness and religiosity in model one is significant[25]. Representing 'Yuck' graphically (see Figure II, below) one can imagine by looking at the slope of the lines, that they will cross at some point, the interaction effect. The greatest effect in model one comes from religiosity, the control which has likely to have made the effect of awareness much smaller (hence the interaction effect). Other influences are much smaller, although interestingly both age and sex are some of them, this would imply that with increasing age one would show less support and that males are more supportive of technologies than females. In model two the influence of gender role traditionalism was tested on the interaction effect of religion and awareness. Table

[20] For the independent t-test, both variables were not normally distributed and had to be transformed by means of taking the logarithm. Using the Levene's test variances it was found that variances for both Internet and Newspaper reading were significantly different ($p<.05$), the t-test shows that there is a significant difference in the means of the two samples (Muslims and Christians).

[21] Except upon introduction of anomia in model three for the Christian sample, but this is expected. Specifically, for model two of the Christian sample, awareness contributes, $\beta = .10$, $t(798) = 2.753$, $p<.01$ and model three of the Muslim sample, $\beta = .196$, $t(1814) = 6.067$, $p<.001$. Awareness was chosen because it is included in many of the preliminary relationships.

[22] The second assumption check after the removal of outliers is presented: some outliers in X remain but are difficult to justify for removal ($34.9>25$, $P < 0.001$). No outliers in Y-space were found ($0,01<1$, $P < 0.001$). The Scatterplot Matrix (see Appendix, Figure I) shows that there is a linear relationship. The P-P plot's straight diagonal line and bell-shaped curve of the histogram indicate that the error terms are normally distributed (see Appendix, Figure IIa-b). The cloud shown by plotting the standardized residuals against the standardized predicted values also means the assumptions of homoscedasticity has been met (see Appendix, Figure III). The independence of errors is not produced in weighted models. Finally, VIF ($1,102<10$) and tolerance ($.907>.2$) show no multicollinearity (see Table I, coefficients, page 16).

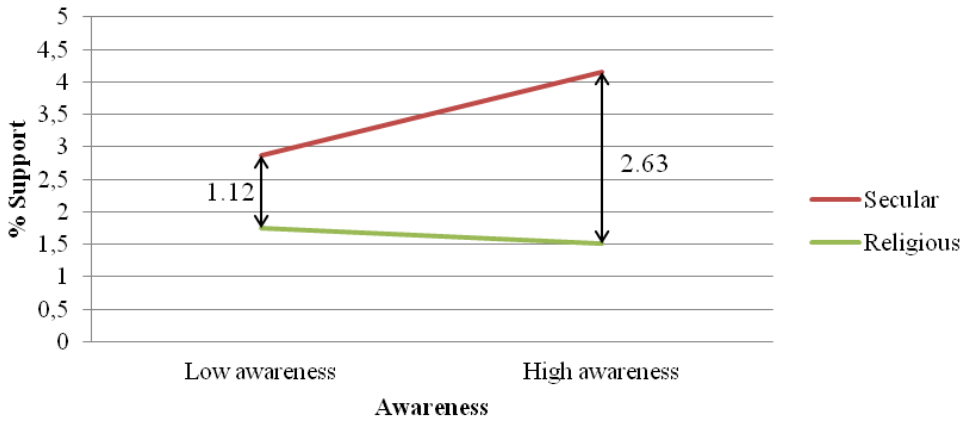
[23] These first two outliers had extremely high or low values (outside two times the standard deviation for six out of eight variables and were the only variables to have this many out of eight).

[24] $R^2 = .163$, $F(5, 4783) = 185.88$, $p <.001$. Model two, $\Delta R^2 = .003$, $F(6, 4782) = 16.146$, $p <.001$ and three, $\Delta R^2 = .03$, $F(7, 4781) = 176.301$, $p <.001$ are significantly better than its predecessor at predicting public support. The ANOVA indicated the models are a significant fit of the data overall as well, for model 1, $F (5, 4783)$, $p<.001$model 2, $F (6, 4782)$, $p<.001$, and model 3, $F (7, 4781)$, $p<.001$.

[25] $\beta = -.04$, $t(4783) = -3.153$, $p<.01$

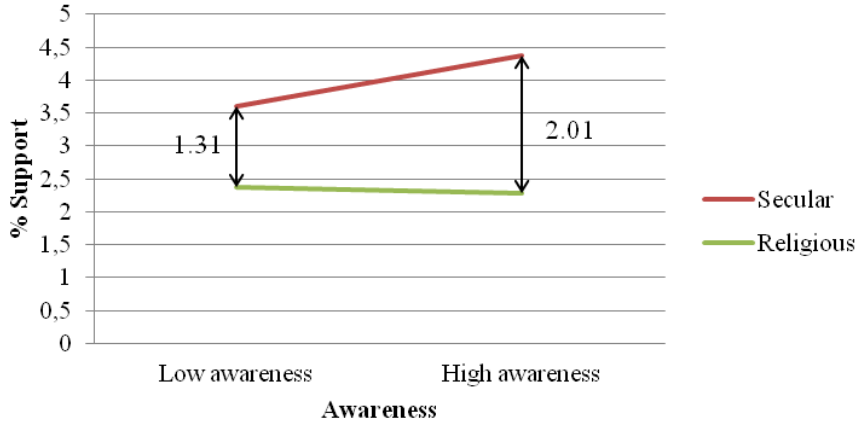
I shows that when controlled for gender role traditionalism, the interaction effect remains significant, interestingly these are the explanations often presented by other authors, such as Niemelä (2011), which seem to have little effect (this is reflected in the beta of the interaction effect of which the change between model one and two is very small, while it remains significant).

Figure II: The 'YuckFactor'



Referring back to Table I, the final model tests the final hypothesis that upon control for anomia, the interaction effect of religion and awareness becomes insignificant. This is also what has happened: upon the introduction of anomia, the interaction effect was no longer significant. It thus seems more likely that anomia can explain why people, regardless of cultural predispositions, if they do not know about new technology, do not accept it. Graphically the change is reflected in the difference between figure two (above) and three (below), whereas in figure two, the slope is so that the two lines will meet, the lines in figure three seem to be running almost parallel, the effect of the interaction effect no longer being significant. It is also however, reflected in the space between the lines, since under 'Yuck' religious and secular lines grow further apart in opinion of technology as awareness increases, whereas the control of anomia has taken away this effect.

Figure III: Controlling for Anomia



5.0 Conclusion

In order to answer the question 'How can we explain that at low levels of awareness, regardless of cultural predispositions, new technology is always rejected?', an attempt is made to answer it on the basis of several hypotheses. Even though its composition differs greatly from previous research, this dataset supports the existence of a 'Yuck factor' or interaction effect of religiosity on the relationship between awareness and public support for technology. In other words, people who are not informed or aware about a new technology, are likely to reject it. It was also found that a highly educated public is more likely to be more aware (or informed), which was theorized to lead them to value the positive sides of a new technology more than the negative. A negative association was also found between gender role traditionalism and awareness. This was hypothesized to be because of the selection of media outlets, depending on education (more progressive outlets) and parental value transmission (progressive or conservative), the news selection based on these existing values would then reinforce already existing values. A similar (negative) relationship was found between awareness and anomia. Here, additional correlations revealed a picture of the anomic individual using media as an escape. This escape may be necessary for an anomic individual, who has a dystopic view of the world and is unable to live up to the cultural norm (i.e. wealth), because the institutional means to do so, such as education, are lacking. Finally, controlling for gender role traditionalism, did not cause the interaction effect of religiosity and awareness to become no longer significant. Anomia however did and could be used to explain why people, when they do not know anything about new technology, regardless of cultural predispositions, do not accept it.

While authors like Nisbet (2005), have shown us that there is such as thing as a 'Yuck factor', the way 'Yuck' functions is often left out of consideration, which is the reason why many authors alike refer to works such as that of Kass (1998) or Niemelä (2011). The 'Yuck factor' is not something intuitive, it is not an involuntary, nor is it in instinctive reaction or 'deep wisdom', and it is certainly not unchangeable. Although the provided alternative explanations to these theories such as that of Niemelä, in terms of gender role traditionalism, contributed to the model in predicting public support for new technology, they did not explain the 'Yuck factor'. Rather, a cultural sociological frame, provides an explanation of 'Yuck' in terms of anomia, where anomia influences the way one looks at the world and so too, the actions one takes. The 'Yuck factor' is important to consider in many present day issues, especially those in the field of biotechnology, think for instance of the organ printing.

Knowing what contributes to 'Yuck' could greatly help in the development of acceptance of new technologies. On that same note, for future research, a cultural sociological exploration of the 'wow factor' (Smits, 2006) would seem like a good extension, that again may help gain acceptance for new technology, and with acceptance, funding. This is also why it is important not to limit such research to biotechnology and expand to other areas of research, or perhaps to reach out to other fields and observe whether similar patterns arise in reactions to, for instance, public policy. What is most important to keep in mind however, is to keep seeking for alternative explanations rather than to dismiss 'Yuck' as intuition.

References

Aiken, L. S., Reno, R. R., & West, S. G. (1996). *Multiple regression : Testing and interpreting interactions*. Newbury Park, Calif. [u.a.]: SAGE.

Arnett, J. J. J. (1995). Adolescents' uses of media for self-socialization. *Journal of Youth and Adolescence, 24*(5), 519-533.

Besley, J. J. C. (2005). Media attention and exposure in relation to support for agricultural biotechnology. *Science Communication, 26*(4), 347-367.

Brashears, M. E. (2010). Anomia and the sacred canopy: Testing a network theory. *Social Networks, 32*(3), 187-196.

CSB Statline. (2011). Bevolking; kerncijfers. Retrieved 22nd of May from: http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLNL&PA=37296ned&D1=a&D2=0,10,20,30,40,50,%28l-1%29-l&HD=120523-1506&HDR=G1&STB=T

De Graaf, P. M., Kalmijn, M., Kraaykamp, G. & Monden, C. W. S. (2010). *The Netherlands Longitudinal Lifecourse Study (NELLS Wave 1).* Dataset. Tilburg University & Radboud University Nijmegen, Netherlands.

De Keere, K. (2010). Wantrouwen in wetenschap: een kwestie van reflexiviteit of maatschappelijk onbehagen? *Sociologie,* (6) 1

Deflem, M. (1989). From anomie to anomia and anomic depression: A sociological critique on the use of anomie in psychiatric research. *Social Science & Medicine, 29*(5), 627-634.

Durant, J., Bauer, MW, and Gaskell, G. (1998). *Biotechnology in the public sphere: A European sourcebook*. London: Science Museum.

Entman, R. R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication, 43*(4), 51-58.

Fan, P. L. (2000). Influences on gender-role attitudes during the transition to adulthood. *Social Science Research, 29*(2), 258.

Fethe, C. (2000, October/November). The Yuck Factor: Charles Fethe on the Wisdom of Repugnance. *Philosophy Now, 29,* 30-32

Field, A. P. (2009). *Discovering statistics using SPSS*. Los Angeles: SAGE.

Hays, K. K. L. (2007). Police chiefs, anomia, and leadership. *Police Quarterly, 10*(1), 3-22.

Hoksbergen, M. (2009). Internet verdringt traditionele mediaproducten. CBS Retrieved 22nd of May from: http://www.cbs.nl/nl-NL/menu/themas/vrije-tijd-cultuur/publicaties/artikelen/archief/2009/2009-2789-wm.htm

Kass, L. R. (1998). Wisdom of repugnance: Why we should ban the cloning of humans, the. *Valparaiso University Law Review, 32*(2), 679-705.

Killian, L. M. (1962). Urbanism, race, and anomia. *The American Journal of Sociology,67* (6) , 661-665.

Kulinowski, K. K. (2004). Nanotechnology: From "Wow" to "Yuck"? *Bulletin of Science, Technology & Society, 24*(1), 13-20.

Larijani, B. (2004). Islamic perspective on human cloning and stem cell research. *Transplantation Proceedings, 36*(10), 3188-3189.

Liqun Cao, J. L. (2010). Social support and anomie: A multilevel analysis of anomie in Europe and North America. *International Journal of Offender Therapy and Comparative Criminology, 54*(4), 625-639.

Meier, D. L. (1959). Anomia and differential access to the achievement of life goals. *American Sociological Review,24* (2), 189-202.

Middleton, R. (1963). Alienation, race, and education. *American Sociological Review, 28*(6), 973-977.

NIEMELÄ, J. J. (2011). WHAT PUTS THE 'YUCK' IN THE YUCK FACTOR? what puts the 'Yuck' in the yuck factor? *Bioethics, 25*(5), 267-279.

Nightingale, V., & Ross, K. (2003). *Critical readings: Media and audiences*. Maidenhead: Open University Press.

Nisbet, M. M. C. (2005). The competition for worldviews: Values, information, and public support for stem cell research. *International Journal of Public Opinion Research, 17*(1), 90-112.

Pardo, R. (2002). Attitudes toward biotechnology in the European Union. *Journal of Biotechnology, 98*(1), 9-24.

Russell, S. S. (2009). Getting over yuck: Moving from psychological to cultural and sociotechnical analyses of responses to water recycling. *Water Policy, 11*(1), 21-35.

Ryan, J. (1981). Marital status, happiness, and anomia. *Journal of Marriage and Family, 43* (3), 643-649.

Schmidt, C. W. (2008). The yuck factor when disgust meets discovery. *Environmental Health Perspectives, 116*(12), A524-A527.

Srole, L. (1956). Social integration and certain corollaries: An exploratory study. *American Sociological Review, 21*(6), 709-716.

Sturgis, P. P. (2004). Science in society: Re-evaluating the deficit model of public attitudes. *Public Understanding of Science, 13*(1), 55-74.

Wassef, W. Y. (1967). The influence of religion, socioeconomic status, and education on anomie. *Sociological Quarterly, 8* (2), 233-238.

Whitbeck, L. B. (1988). Value attributions and value transmission between parents and children. *Journal of Marriage and Family, 50* (3), 829-840.

Appendix

Table 1: Selected Survey Questions

Awareness (w1fa74 and w1scc17f)

A74. Leest u wel eens kranten of tijdschriften (niet voor werk of studie)? Zo ja, hoeveel tijd besteedt u dan gemiddeld per week aan het lezen van kranten en tijdschriften?

1. lees nooit kranten/tijdschriften
2. minder dan 1 uur per week
3. 1 à 2 uur per week
4. 2 à 3 uur per week
5. meer dan 3 uur per week

C17. Nu enkele vragen over uw gebruik van internet. Hoe veel tijd besteedt u aan de volgende dingen op internet? Het gaat niet om contacten of activiteiten ten behoeve van werk of studie.

f. bezoeken nieuws-sites (bijv. nu.nl, nos.nl)

1. een uur of meer per dag
2. ongeveer een half uur per dag
3. ongeveer een kwartier per dag
4. niet dagelijks; één of meer keer per week
5. niet dagelijks; één of meer keer per maand
6. minder vaak dan eens per maand
7. vrijwel) nooit

Public Support for Technology (w1sce12a to w1sce12d)

E12. Vindt u de volgende zaken verkeerd of niet verkeerd?

a. een kind verwekken via kunstmatige bevruchting

b. embryo’s selecteren die vrij zijn van erfelijke ziektes

c. klonen van dieren

d. genetische manipulatie van voedsel

1. altijd verkeerd
2. bijna altijd verkeerd
3. in sommige gevallen verkeerd
4. nooit verkeerd

Religiosity (w1sce15 and w1fa65)

E15. Hoe belangrijk is het geloof voor u persoonlijk?

1. heel belangrijk
2. belangrijk
3. niet belangrijk, niet onbelangrijk
4. niet belangrijk
5. helemaal niet belangrijk

A65. Hoe vaak gaat u naar een godsdienstige bijeenkomst in een kerk, moskee, synagoge, tempel, of schrijn? Is dat…

1. nooit
2. 1-2 keer per jaar
3. 3-11 keer per jaar
4. 1 keer per maand
5. 2-3 keer per maand
6. iedere week
7. meerdere keren per week

Gender Role Traditionalism (w1sce7a to w1sce7d)

E7. Wilt u voor elk van de stellingen aangeven wat uw mening is?

a. een man is even geschikt om voor een baby te zorgen als een vrouw

b. het is onnatuurlijk als de man het huishouden doet

c. man en vrouw moeten evenveel bijdragen aan de opvoeding

d. het is goed voor een jong kind als de vader ook bijdraagt aan zijn/haar verzorging

1. zeer mee eens
2. mee eens
3. neutraal
4. mee oneens
5. zeer mee oneens

Anomia (w1sce3a to w1sce3e)

E3. Wilt u voor elk van de stellingen aangeven wat uw mening is?

a. je weet tegenwoordig echt niet meer wie je nog kunt vertrouwen

b. de meeste mensen vallen tegen als je ze beter leert kennen

c. om een beter bestaan te krijgen moet je vooral geluk hebben

d. in tegenstelling tot wat steeds wordt beweerd, gaat het met gewone mensen steeds slechter

e. kritiek hebben op de politiek is zinloos, want de politiek trekt zich er toch niks van aan

1. zeer mee eens
2. mee eens
3. neutraal
4. mee oneens
5. zeer mee oneens

Education (w1fa23b02 to w1fa23b15)

[A23a Welke van de volgende opleidingen heeft u gevolgd?]

Selectie A23a =ja [dus voor alle aangekruiste opleidingen stellen]

A23b. Heeft u deze opleiding met een diploma afgerond?

1. ja
2. nee

2. lagere school
3. lbo, vmbo-kb/bbl
4. mavo, vmbo-tl
5. havo
6. vwo/gymnasium
7. mbo-kort (kmbo), primair leerlingwezen, bol/bbl niveau 1 of 2
8. mbo-tussen/lang (mbo), secundair/tertiar leerlingwezen, bol/bbl niveau 3 of 4
9. hbo
10. universiteit (bachelor)
11. universiteit (master, doctoraal)
12. promotietraject
13. buitenlandse opleiding, niet goed in te delen, lager onderwijs
14. buitenlandse opleiding, niet goed in te delen, middelbaar onderwijs
15. buitenlandse opleiding, niet goed in te delen, hoger onderwijs
16. geen opleiding

Figure I: Linearity, Scatterplot

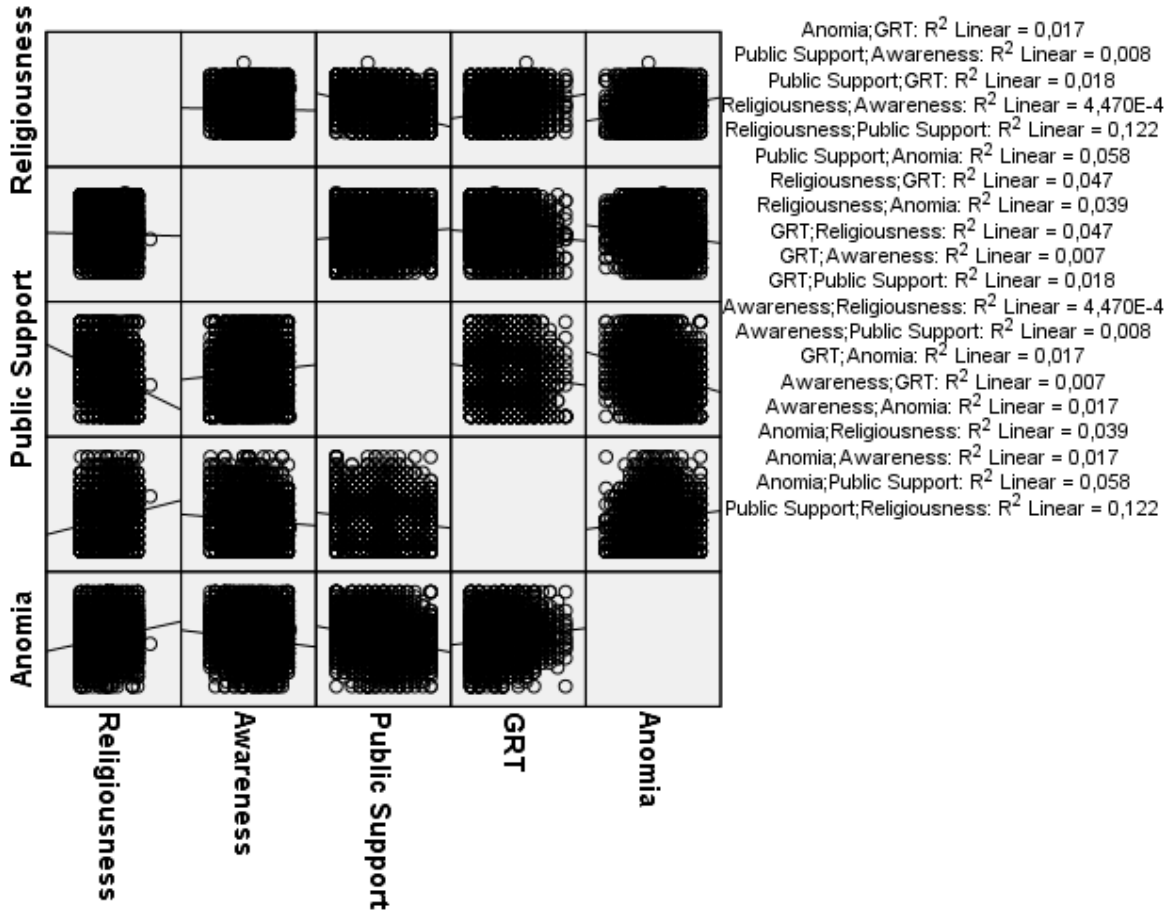


Figure IIa: Model 3, Normally distribution of error terms, P-P Plot

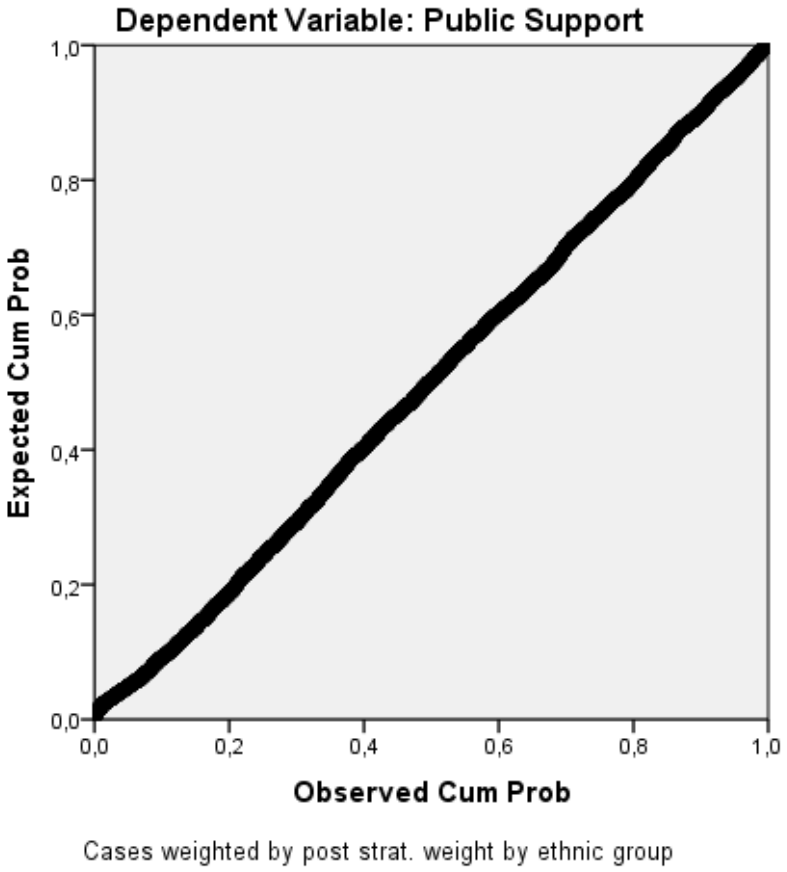


Figure IIb: Model 3, Normally distribution of error terms, histogram

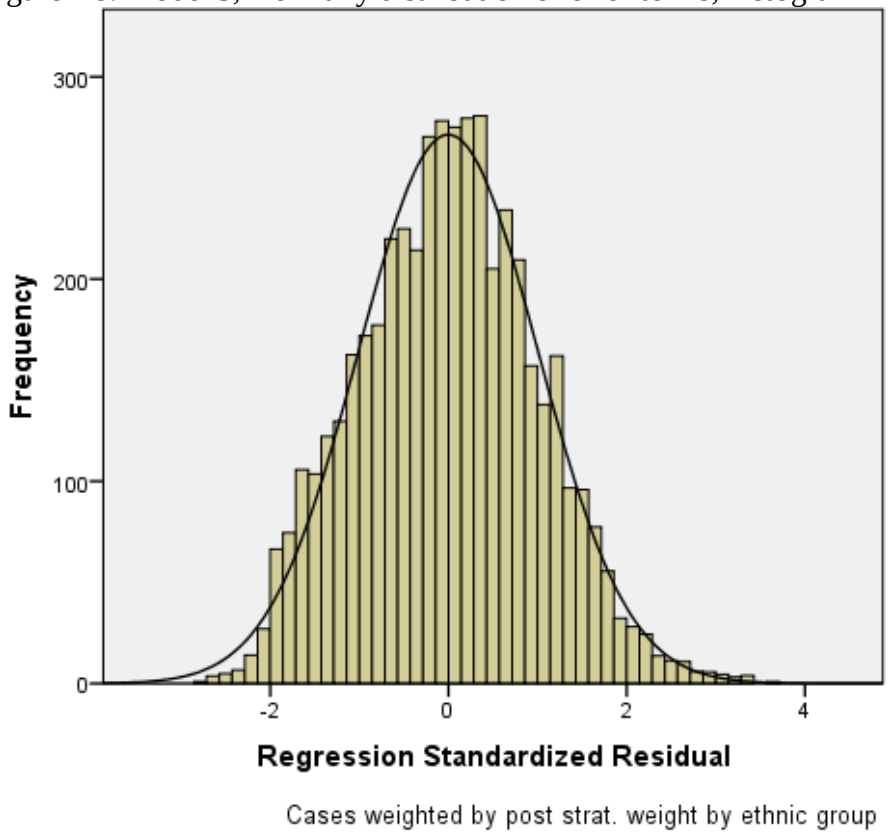


Figure III: Model 3, Homoscedasticity, Error plot

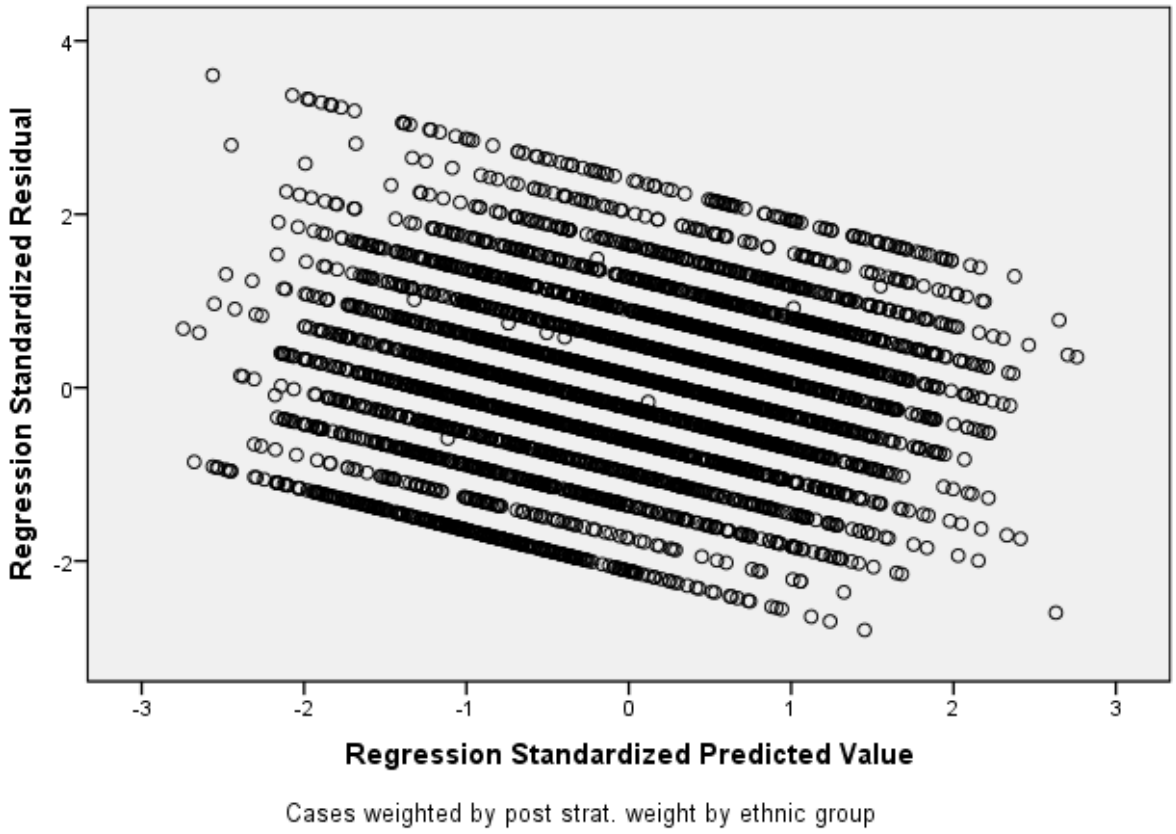


Table I: Correlations

		Awareness	Anomia	GRT	Education	Religiosity	Public Support	Age	Gender
Awareness	Pearson Correlation	1	-.147**	-.086**	.247**	.002	.101**	,148**	,148**
	N	5312	4868	4870	5226	2548	4844	5308	5308
Anomia	Pearson Correlation	-,147**	1	,149**	-,313**	,062**	-,237**	-0,021	-0,021
	N	4868	4868	4864	4805	2357	4838	4824	4824
GRT	Pearson Correlation	-,086**	,149**	1	-,116**	,114**	-,127**	,132**	,132**
	N	4870	4864	4870	4806	2361	4840	4823	4823
Education	Pearson Correlation	,247**	-,313**	-,116**	1	-,116**	,152**	-0,016	-0,016
	N	5226	4805	4806	5226	2496	4782	5226	5226
Religiosity	Pearson Correlation	0,002	,062**	,114**	-,116**	1	-,174**	,191**	,191**
	N	2548	2357	2361	2496	2548	2345	2557	2557
Public Support	Pearson Correlation	,101**	-,237**	-,127**	,152**	-,174**	1	-,049**	,034*
	N	4844	4838	4840	4782	2345	5312	4798	4798
Age	Pearson Correlation	,101**	,132**	-0,016	,191**	,034*	0,018	1	-0,021
Gender	N	5308	4824	4823	5226	2557	4798	5308	5308

** Correlation is significant at the 0.01 level (2-tailed)[26].

[26] The N is likely to differ because of the imposed weights.