Final Data Project

GRAD-E1244: Data Management (with R)

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1. Introduction

A witch-hunt prevailed in Europe from 15th century to 18th century. According to the previous studies, it is said that as many as 40,000 people was executed at most in Europe due to witch trials (*Briggs, 1996*; *Hutton, 2002*; *Behringe, 2004*). Although quite a few scholars have investigated the phenomenon of the witch-hunt, many things still remain a mystery. Especially, a lot of arguments exist regarding its cause and who was more likely to be judged as a witch. Michelet (1939) states that people identified or suspected as witches were peasants who believed in an ancient religion. Meanwhile, other scholars argue that those people were female healers and witches meetings were ones to exchange medical information among such women (*Ehrenreich and English, 2010*). Even though there are many studies, why the witch-hunt occurred and its purpose have not completely been revealed yet. This essay, therefore, tries to find a clue about what drove people to conduct the witch-hunt by means of identifying factors which made accused people being judged as witches.

This paper is organized as follows: section 2 briefly explains how data used in this study was complied. In section 3, the descriptive statistics of the data and hypotheses induced by the statistics are presented. Section 4 indicates the methods and results of logit model analysis. Discussing these results, the conclusions are offered in section 5.

2. Data Preparation

In this study, the database of "The Survey of Scottish Witchcraft" (Goodare, 2003) is used. It contains data about witchcraft accusation and trial

processes conducted from 1563 to 1736 regarding roughly 4,000 people. The database is network one and consists of three levels: Accused, Case and Trial. Accused level contains biographical information about people accused as witches. Case one does the information about series of events and specific accusations. The last one records data about trials as to each case. The database has 38 datasets, but only 6 datasets of them are used in the study to focus on critical factors which contributed for people to being judged as guilty, and they are combined into one dataset to be analyzed. Furthermore, this study uses only data about 375 people whose information about judgements or sentences is recorded in the database for the same reason. Also, when there are more than one trial concerning one accused person, the latest one is used to prevent data from being intermingled. For more detail information about the dataset in this study, see Appendix 1.

3. Descriptive Statistics of Dataset and Hypotheses

The witch-hunt tends to be seen as one that is related to only female people, but in fact, many men were executed as results of witch trials. Accordingly, the dataset also contains 53 male people out of 375 people (Table 1). It is examined, therefore, if there seems to be any gender difference regarding being judged as guilty. As Fig. 1 implicates, there seems to be no difference as to gender. So, it induces the following first hypothesis.

Hypothesis 1: no gender difference about being judged as guilty

On the other hand, there seems to be difference depending on regions (Fig. 2). From this implication, the second hypothesis is obtained as below.

		Nr. Obs.
Total		375
Judged as Guilty	Yes	280
	No	95
Gendar	Female	318
	Male	53
	NA	4
Region	Aberdeen	40
	Argyll	1
	Ayr	28
	Banff	1
	Bewick	4
	Bute	1
	Clackmannan	6
	Dumfries	16
	Dunbarton	2
	Edinburgh	68
	Elgin	2
	Fife	24
	Forfar	1
	Haddington	36
	Inverness	3
	Kinross	1
	Kirkcudbright	11
	Lanark	12
	Linlithgow	3
	Orkney	16
	Peebles	5
	Perth	20
	Renfrew	37
	Ross	9
	Selkirk	1
	Shetland	4
	Stirling	15
	Wigtown	2
	NA	6

Table 1: Number of observations in each sex and region

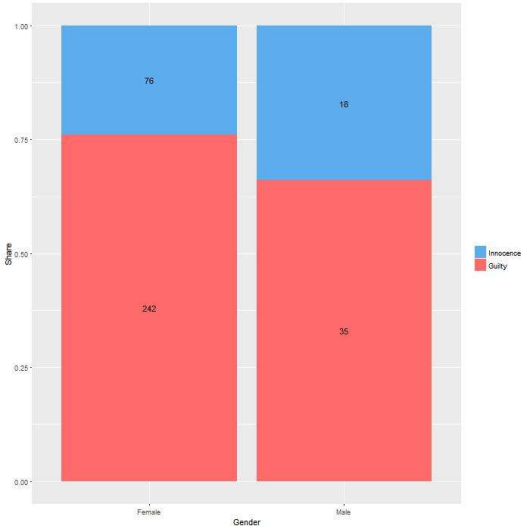

Fig. 1: Gender difference in guilty rates

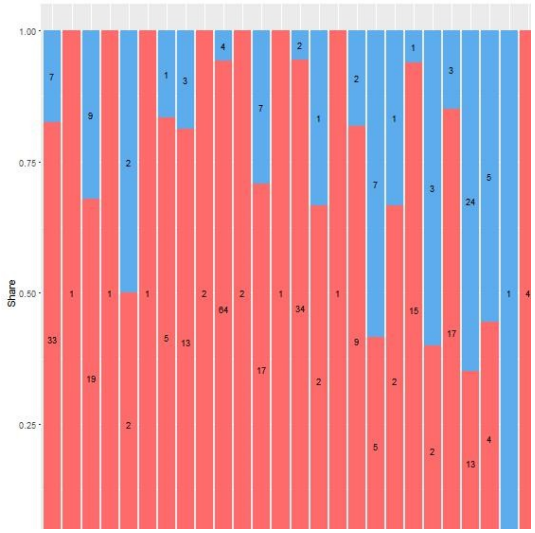

Fig. 2: Regional difference in guilty rates

Hypothesis 2: guilty rates vary depending on regions

Also, it is well-known that until the modern era, confessed suspects are more likely to be judged as guilty even if no sufficient evidence exists. Taking into account this point, the following third hypothesis would be conceivable.

Hypothesis 3: confessed people are more likely to be judged as guilty

Moreover, analyzing difference in guilty rates depending on accused people's names, the rates seems to vary depending on them (see Appendix 2). From this perspective, the last hypothesis is constructed as below.

Hypothesis 4: Guilty rates vary depending on names

In the following section, the dataset is analyzed using logit model to examine these hypotheses.

4. Logit Model Analysis

At first, simple logit models are constructed to examine hypothesis 1, 2 and 3. Table 2 shows their results, and it could be said that all these hypothesis are correct since the coefficients of existence or number of confessions and those of some regions are statistically significant while those of gender is not. For further examination, quadratic model regarding the confession variable are implemented, but the coefficient of the quadratic confession variable is not significant (see Appendix 3). Also, to clarify the mechanism regarding what drove people to confess or the effect of confession on being judged as guilty, other models are implemented, but they doesn't give any clue (see Appendix 4).

As next, the relationship between names and being judged as witches is examined using other logit models. Yet, any statistically significant results aren't obtained (Table 3 and data not shown in the paper). To investigate further, other models are built using initials of names and ends of them because their distribution can vary depending on ethnic or religious background, but they don't acquire significant coefficients either (see Appendix 5-8).

	Dependent variable:			
	Guilty			
	(1)	(2)	(3)	(4)
Mentioned As Witch	13.133 (578.103)	16.055 (2,566.235)		
Confession	1.898*** (0.374)	1.907*** (0.429)		
Torture	0.110 (0.829)	-0.252 (1.029)		
Nr. Mentioned As Witch			13.880 (899.738)	14.470 (2,237.809)
Nr. Confession			1.301*** (0.310)	1.370*** (0.360)
Nr. Torture			0.123 (0.816)	-0.413 (1.018)
Male	-0.556 (0.339)	-0.442 (0.455)	-0.549 (0.338)	-0.481 (0.454)
Argyll		14.846 (3,956.180)		15.364 (3,956.180)
Ayr		-0.762 (0.604)		-0.801 (0.601)
Banff		16.312 (3,956.180)		16.253 (3,956.180)
Berwick		-1.562 (1.170)		-1.723 (1.220)
Bute		14.404 (3,956.180)		14.882 (3,956.180)
Clackmannan		-0.179 (1.239)		-0.108 (1.217)
Dumfries		0.147 (0.776)		0.098 (0.774)
Dunbarton		16.754 (2,797.442)		16.734 (2,797.442)
Edinburgh		1.129 (0.741)		1.011 (0.742)
Elgin		16.312 (2,797.442)		16.253 (2,797.442)
Fife		-0.828 (0.646)		-0.890 (0.648)
Forfar		16.312 (3,956.180)		16.253 (3,956.180)
Haddington		1.201 (0.864)		1.195 (0.866)
Inverness		-0.259 (1.329)		-0.290 (1.328)
Kinross		14.846 (3,956.180)		15.364 (3,956.180)
Kirkcudbright		-0.067 (0.911)		-0.105 (0.907)
Lanark		-2.233*** (0.787)		-2.199*** (0.771)
Linlithgow		-1.040 (1.372)		-1.204 (1.415)
Orkney		1.096 (1.130)		1.089 (1.127)
Peebles		-1.777 (1.111)		-1.718 (1.079)
Perth		0.255 (0.767)		0.224 (0.764)
Renfrew		-2.323*** (0.578)		-2.290*** (0.569)
Ross		-1.972** (0.878)		-1.847** (0.844)
Selkirk		-18.379 (3,956.180)		-18.398 (3,956.180)
Shetland		16.312 (1,978.090)		16.253 (1,978.090)
Stirling		-2.354*** (0.734)		-2.375*** (0.730)
Wigtown		15.631 (2,627.242)		15.204 (2,336.375)
Constant	0.726*** (0.146)	1.255*** (0.434)	0.744*** (0.145)	1.313*** (0.432)
Observations	371	365	371	365
Log Likelihood	-189.806	-141.003	-188.582	-141.346
Akaike Inf. Crit.	389.612	346.005	387.164	346.692
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 2: Logit models to examine hypothesis 1-3

	Dependent variable:
	guilty
mentionedaswitch_e	0.000 (15,208.470)
confession_e	1.778*** (0.442)
torture_e	1.143 (1.343)
sexMale	18.500 (10,754.010)
firstnameAgnes (Bigis)	16.973 (10,754.010)
firstnameAlesoun	15.830 (10,754.010)
firstnameAlesoune	-20.382 (10,754.010)
firstnameAlexander	-19.713 (10,754.010)
firstnameAlison	18.751 (10,754.010)
firstnameAlisone	16.973 (10,754.010)
firstnameAlleson	16.973 (10,754.010)
firstnameAndro	-1.528 (15,208.470)
firstnameAnie	18.751 (10,754.010)
firstnameAnna	-2.276 (2.016)
firstnameAnnabel	-20.382 (10,754.010)
firstnameAnnabell	16.973 (18,626.500)
firstnameAnnas	18.751 (10,754.010)
firstnameBarbara	-0.015 (1.326)
firstnameBartie	-1.528 (15,208.470)
firstnameBeatrix	18.090 (7,148.015)
firstnameBeigis	18.751 (10,754.010)
firstnameBessie	-0.130 (0.842)
firstnameCatharin	-1.704 (1.668)
firstnameChristen	16.973 (10,754.010)
firstnameChristian	18.246 (3,871.602)
firstnameChristiane	16.973 (6,208.832)
firstnameChristine	16.973 (10,754.010)
firstnameCristian	16.973 (10,754.010)
firstnameDavid	-21.665 (10,754.010)
firstnameDonald	-1.528 (15,208.470)
firstnameEffie	18.751 (10,754.010)
firstnameElizabeth	-0.726 (0.983)
firstnameEllen	18.751 (10,754.010)
firstnameElspet	18.090 (7,148.015)
firstnameElspeth	-0.499 (0.866)
firstnameElspett	16.973 (10,754.010)
firstnameElspit	18.751 (10,754.010)
firstnameErsche Marioun	18.751 (10,754.010)
firstnameEwfame	17.608 (10,754.010)
firstnameFrancis	-38.882 (15,208.470)
firstnameGeilles	-20.382 (10,754.010)
firstnameGeorge	0.250 (15,208.470)
firstnameGilbert	-19.079 (10,754.010)
firstnameGrissel	18.751 (10,754.010)
firstnameGrissell	18.090 (7,148.015)
firstnameHector	-38.882 (15,208.470)
firstnameHelen	0.413 (0.988)
firstnameHelene	18.090 (7,148.015)
firstnameHelline	16.973 (10,754.010)
firstnameIsdobell	-20.382 (10,754.010)
firstnameIsobel	18.236 (4,550.951)
firstnameIsobell	-0.406 (1.362)
firstnameIsobell (Elspeth)	16.973 (10,754.010)
firstnameIssabell	-20.382 (10,754.010)
firstnameIssobel	-0.122 (1.360)
firstnameIssobell	1.149 (1.210)
firstnameJames	-19.227 (10,754.010)
firstnameJanet	0.131 (0.787)
firstnameJannet	-2.701** (1.327)
firstnameJannett	18.751 (10,754.010)
firstnameJean	-0.841 (0.851)
firstnameJenet	18.751 (7,604.235)
firstnameJennat	16.973 (10,754.010)
firstnameJoan	-20.382 (10,754.010)
firstnameJohn	-20.382 (10,754.010)
firstnameJohne	0.250 (13,170.920)
firstnameJohnne	-0.172 (12,272.010)
firstnameJohnnet	18.751 (10,754.010)
firstnameJon	-0.411 (12,912.900)
firstnameJonat	-0.122 (1.360)
firstnameJonet	0.198 (0.778)
firstnameJonnet	16.973 (7,604.235)
firstnameJonnett	-20.382 (10,754.010)
firstnameKatharine	18.751 (7,604.235)
firstnameKatherene	-1.509 (1.360)
firstnameKatherine	18.546 (3,019.153)
firstnameKathrin	18.751 (10,754.010)
firstnameLachlan	0.250 (15,208.470)
firstnameLilias	18.751 (10,754.010)
firstnameMagdalin	-20.382 (10,754.010)
firstnameMarable	16.973 (10,754.010)
firstnameMargaret	0.009 (0.718)
firstnameMargerat	18.751 (10,754.010)
firstnameMargrat	-0.122 (1.360)
firstnameMargret	16.973 (10,754.010)
firstnameMarie Nian	-20.382 (10,754.010)
firstnameMarion	-0.694 (0.947)
firstnameMarione	-20.382 (10,754.010)
firstnameMarioun	-1.704 (1.668)
firstnameMarjory	18.090 (7,148.015)
firstnameMary	-20.756 (5,234.244)
firstnameMawsie	18.751 (10,754.010)
firstnameMeg	18.751 (10,754.010)
firstnameMeriorie	-20.382 (10,754.010)
firstnameMichaell	-2.671 (15,208.470)
firstnameNeving	18.751 (10,754.010)
firstnameNicholas	-20.382 (10,754.010)
firstnamePatrick	0.250 (15,208.470)
firstnamePatrik	0.250 (15,208.470)
firstnameRichard	-38.882 (15,208.470)
firstnameRobert	-1.528 (15,208.470)
firstnameThomas	-18.761 (10,754.010)
firstnameTibbie	18.751 (10,754.010)
firstnameunknown	16.973 (10,754.010)
firstnameUnknown	-20.382 (10,754.010)
firstnameViolat	18.751 (10,754.010)
firstnameViolet	16.973 (10,754.010)
firstnameWilliam	-19.316 (10,754.010)
Constant	0.816 (0.592)
Observations	371
Log Likelihood	-128.584
Akaike Inf. Crit.	475.169
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 3: Logit model to examine hypothesis 4

5. Conclusion and Discussion

From the results presented above, the following four conclusion can be obtained. The first one is that there is no correlation between gender and propensity to have been judged as guilty or witches. So, people might not have been afraid of witches as a symbol or imaginary one such as female ones in fairy tales, but they might rather have been scared of ones who could really do something evil.

The second conclusion is that people living in some regions were less likely to be identified as witches compared to other regions (Fig. 3). These regions are Lanark, Renfrew, Ross, Stirling. Seeing the locations of them, there seems to not be large difference in terms of geography. So, the reason why people living in these areas were less likely to be judged as guilty should be examined in future study.

Thirdly, it can be concluded that confessed people tended to be judged as guilty as is the case with trials until the modern era (Fig. 4). Also, according to the result, the more people confessed, the more likely they were identified as witches (Table 2 and Fig. 5).

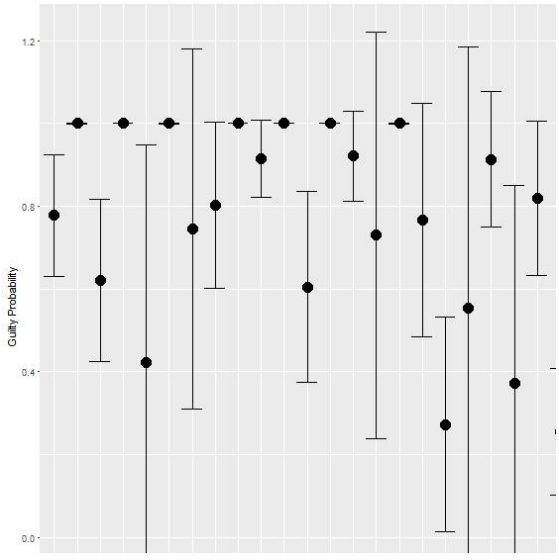

Fig. 3: Guilty probabilities across regions

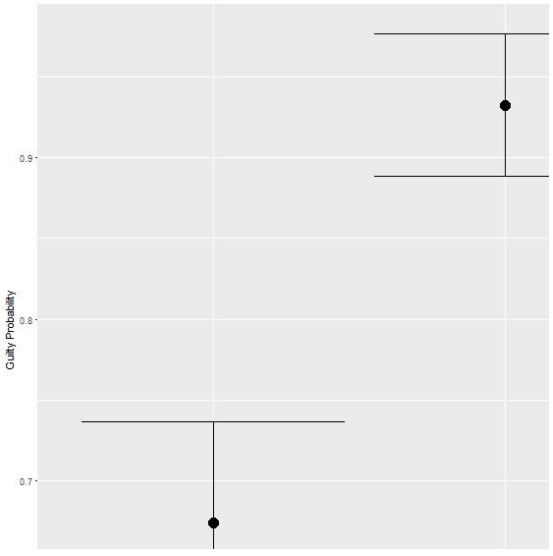

Fig. 4: Guilty probabilities depending on confession

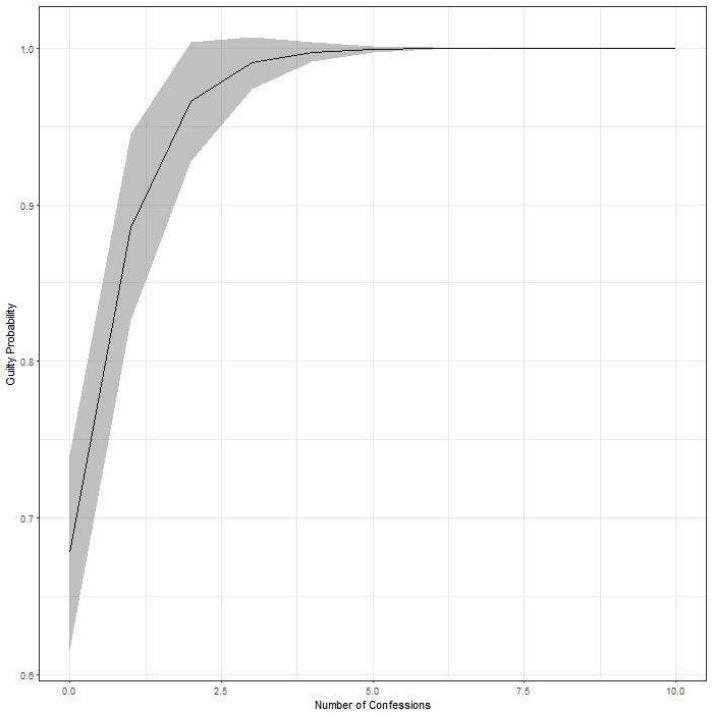

Fig. 5: Guilty probabilities depending on number of confessions

The last but not least conclusion is that in this study, no relationship between names and propensity to be judged as witches are identified. It would imply that some persecution wasn't the reason why the witch-hunt prevailed in the early modern period. There is possibility, however, that we can identify the correlation if the names are properly categorized using dictionaries of names related to ethnicity or religion.

According the results discussed above, it can be said that the witch-hunt emerged from mass hysteria rather than discrimination or persecution, since there is no relationship between guilty propensity and names but there is between the former and confession in trials. The fact that people deemed to do something good (e.g. consulting or healing human) were less likely to be judged as guilty also support this idea (see Appendix 9). Even further study is necessary, however, to more completely understand this weird phenomenon.

6. References

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7. Appendix Figures & Tables

Appendix 1: Datasets and variables used in the study

WDB_Accused		
Column	**Data Type**	**Description**
FirstName	Character(50)	First name as given in the source
LastName	Character(50)	Surname as given in the source
M_Firstname	Character(50)	Standard modern first name
M_Surname	Character(50)	Standard modern surname
Sex	Character(6)	Sex of the accused
Res_county	Character(50)	Place of residence - county
WDB_Case		
Column	**Data Type**	**Description**
UNorthodoxRelPract_p	Yes/No	Unorthodox religious practice as primary characterisation of case - the team decided this was the main theme
UNorthodoxRelPract_s	Yes/No	Unorthodox religious practice as secondary characterisation of case - the team found this mentioned in the documentation
Consulting_p	Yes/No	Consulting a witch as primary characterisation of case - the team decided this was the main theme
Consulting_s	Yes/No	Consulting a witch as secondary characterisation of case - the team found this mentioned in the documentation
Demonic_p	Yes/No	Demonic elements as primary characterisation of case - the team decided this was the main theme
Demonic_s	Yes/No	Demonic elements as secondary characterisation of case - the team found this mentioned in the documentation
Demonic_possess_p	Yes/No	Demonic possession as primary characterisation of case - the team decided this was the main theme

Demonic_possess_s	Yes/No	Demonic possession as secondary characterisation of case - the team found this mentioned in the documentation
Fairies_p	Yes/No	Fairies as primary characterisation of case - the team decided this was the main theme
Fairies_s	Yes/No	Fairies as secondary characterisation of case - the team found this mentioned in the documentation
Folk_healing_p	Yes/No	Folk healing as primary characterisation of case - the team decided this was the main theme
Folk_healing_s	Yes/No	Folk healing as secondary characterisation of case - the team found this mentioned in the documentation
Maleficium_p	Yes/No	Maleficium as primary characterisation of case - the team decided this was the main theme
Maleficium_s	Yes/No	Maleficium as secondary characterisation of case - the team found this mentioned in the documentation
Midwifery_p	Yes/No	Midwifery as primary characterisation of case - the team decided this was the main theme
Midwifery_s	Yes/No	Midwifery as secondary characterisation of case - the team found this mentioned in the documentation
ImplicatedByAnother_p	Yes/No	Named as accomplice as primary characterisation of case - the team decided this was the main theme
ImplicatedByAnother_s	Yes/No	Named as accomplice as secondary characterisation of case - the team found this mentioned in the documentation
Neighbhd_dispute_p	Yes/No	Neighbourhood dispute as primary characterisation of case - the team decided this was the main theme

Neighbhd_dispute_s	Yes/No	Neighbourhood dispute as secondary characterisation of case - the team found this mentioned in the documentation
PoliticalMotive_p	Yes/No	Political motive as primary characterisation of case - the team decided this was the main theme
PoliticalMotive_s	Yes/No	Political motive as secondary characterisation of case - the team found this mentioned in the documentation
PropertyMotive_p	Yes/No	Property motive as primary characterisation of case - the team decided this was the main theme
PropertyMotive_s	Yes/No	Property motive as secondary characterisation of case - the team found this mentioned in the documentation
RefusedCharity_p	Yes/No	Refused Charity as primary characterisation of case - the team decided this was the main theme
RefusedCharity_s	Yes/No	Refused Charity as secondary characterisation of case - the team found this mentioned in the documentation
Treason_p	Yes/No	Treason as primary characterisation of case - the team decided this was the main theme
Treason_s	Yes/No	Treason as secondary characterisation of case - the team found this mentioned in the documentation
Other_p	Yes/No	Other primary characterisation
Other_s	Yes/No	Other secondary characterisation
WhiteMagic_p	Yes/No	White Magic as primary characterisation - the team decided this was the main theme
WhiteMagic_s	Yes/No	White Magic as secondary characterisation - the team found this mentioned in the documentation
WitchesMeeting	Yes/No	Witches' meetings - accused attended

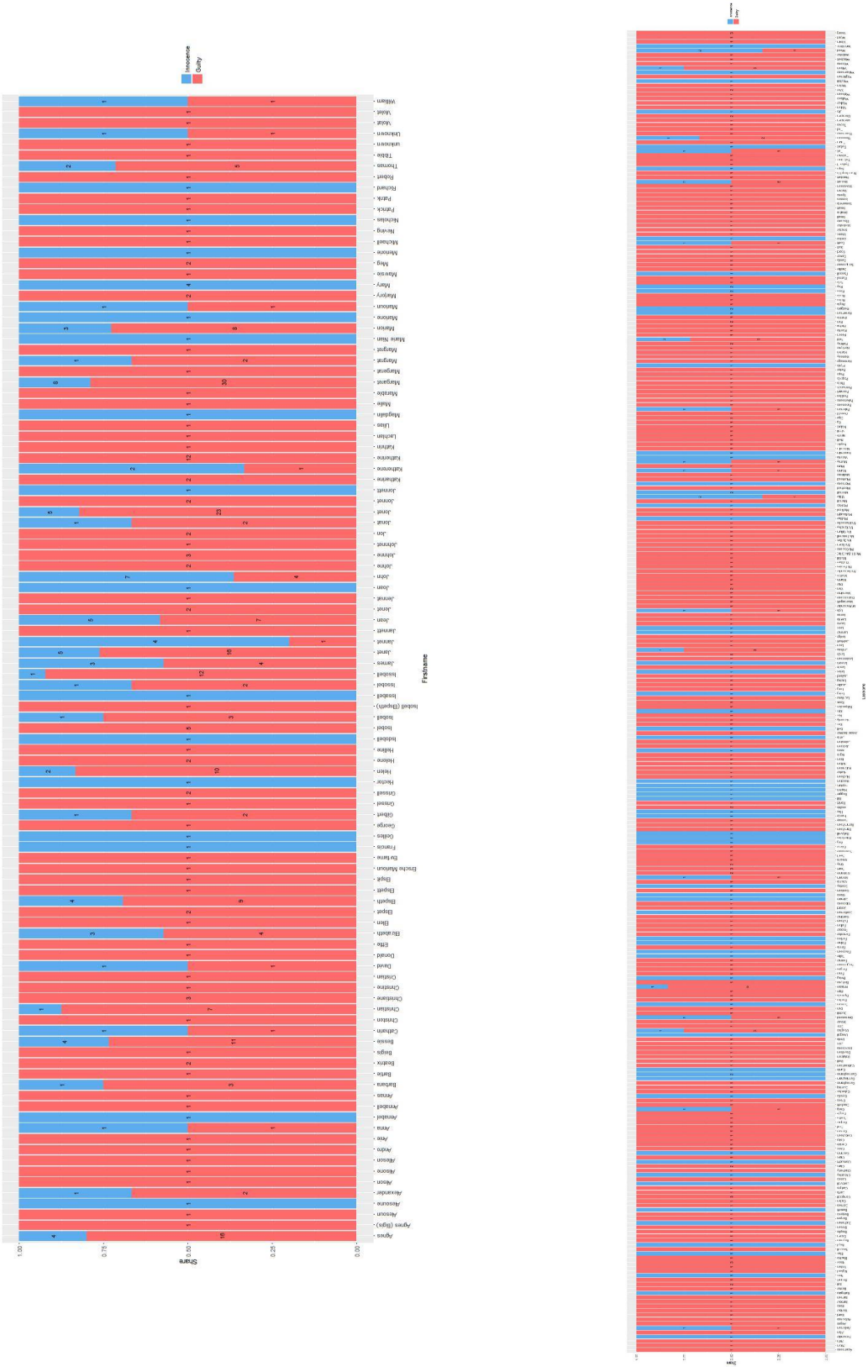
DevilPresent	Yes/No	Witches' meetings - Devil Present at a meeting
Maleficium	Yes/No	Witches' meetings - Collective maleficium organised or committed at a meeting
CommunalSex	Yes/No	Witches' meetings - Communal sex at a meeting
DevilWorship	Yes/No	Witches' meetings - Worship of the Devil at a meeting
FoodAndDrink	Yes/No	Witches' meetings - Food and Drink consumed at a meeting
Dancing	Yes/No	Witches' meetings - Dancing at a meeting
Singing	Yes/No	Witches' meetings - Singing at a meeting
Elphane/Fairyland	Yes/No	Folk Culture - Elphane/Fairyland mentioned or described
Food/Drink	Yes/No	Folk Culture - Food/Drink consumed at Elphane or fairyland
SpecificVerbalFormulae	Yes/No	Folk Culture - Specific Verbal Formulae used for curing or any other ritual were discussed in the documentation
SpecificRitualActs	Yes/No	Folk Culture - Specific Ritual Acts were discussed in the documentation
Familiars	Yes/No	Folk Culture - The accused had a familiar (a small animal or spirit that did her bidding)
Shape-Changing	Yes/No	Folk Culture - The documentation mentioned shape-changing of the accused
Dreams/Visions	Yes/No	Folk Culture - Accused appeared in a Dream or Visions
UnorthodoxReligiousPractice	Yes/No	Folk Culture - Accused used an Unorthodox Religious Practice
SympatheticMagic	Yes/No	Folk Culture - Sympathetic magic (use of an object to stand in for a person) was alleged
Ridingdead	Yes/No	Folk Culture - Riding with the dead
HumanIllness	Yes/No	Diseases/Illness - Accused caused Human illness

HumanDeath	Yes/No	Diseases/Illness - Accused caused Human death
AnimalIllness	Yes/No	Diseases/Illness - Accused caused Animal illness
AnimalDeath	Yes/No	Diseases/Illness - Accused caused Animal death
FemaleInfertility	Yes/No	Diseases/Illness - Accused caused Female infertility
MaleImpotence	Yes/No	Diseases/Illness - Accused caused Male impotence
AggravatingDisease	Yes/No	Diseases/Illness - Accused Aggravated an already existing disease
TransferringDisease	Yes/No	Diseases/Illness - Accused Transferred a disease from sick person to someone or something else
LayingOn	Yes/No	Diseases/Illness - Accused Layed on and took off a disease
Removalbewitchment	Yes/No	Diseases/Illness - Accused Removed a bewitchment
Quarreling	Yes/No	Diseases/Illness - Accused Quarrelled
Cursing	Yes/No	Diseases/Illness - Accused Cursed someone
Poisoning	Yes/No	Diseases/Illness - Accused Poisoned someone
RecHealer	Yes/No	Diseases/Illness - Accused was a Recognised healer
HealingHumans	Yes/No	Diseases/Illness - Accused Healed humans
HealingAnimals	Yes/No	Diseases/Illness - Accused Healed animals
Midwifery	Yes/No	Diseases/Illness - Accused practised Midwifery
WDB_Confession		
Column	**Data Type**	**Description**
Trialref	Character(20)	Local identifier for trial

		* used to create the variables indicating existence of confession and number of confession
WDB_MentionedAsWitch		
Column	**Data Type**	**Description**
Trialref	Character(20)	Local identifier for trial * used to create the variables indicating existence of mentioned as a witch in another trial and number of that
WDB_Torture		
Column	**Data Type**	**Description**
Trialref	Character(20)	Local identifier for trial * used to create the variables indicating existence of torture and number of torture
WDB_Trial		
Column	**Data Type**	**Description**
TrialType	Byte	Type of trial
Verdict	Character(50)	Verdict
Sentence	Character(50)	Sentence

* From *Verdict* and *Sentence,* the variable indicating guilty or non-guilty is created

Appendix 2: Guilty rates across names



Appendix 3: Logit models to examine quadratic function of number of confession

	Dependent variable:			
	Guilty			
	(1)	(2)	(3)	(4)
Nr. Mentioned As Witch	13.880 (899.738)	13.866 (887.289)	14.470 (2,237.809)	14.940 (2,560.708)
Nr. Confession	1.301*** (0.310)	1.464*** (0.424)	1.370*** (0.360)	1.606*** (0.445)
Nr. Confession 2		-0.093 (0.140)		-0.136 (0.111)
Nr. Torture	0.123 (0.816)	0.119 (0.815)	-0.413 (1.018)	-0.398 (1.018)
Male	-0.549 (0.338)	-0.552 (0.339)	-0.481 (0.454)	-0.476 (0.454)
Argyll			15.364 (3,956.180)	15.272 (3,956.180)
Ayr			-0.801 (0.601)	-0.792 (0.602)
Banff			16.253 (3,956.180)	16.266 (3,956.180)
Berwick			-1.723 (1.220)	-1.704 (1.216)
Bute			14.882 (3,956.180)	14.796 (3,956.180)
Clackmannan			-0.108 (1.217)	-0.122 (1.221)
Dumfries			0.098 (0.774)	0.108 (0.775)
Dunbarton			16.734 (2,797.442)	16.742 (2,797.442)
Edinburgh			1.011 (0.742)	1.020 (0.742)
Elgin			16.253 (2,797.442)	16.266 (2,797.442)
Fife			-0.890 (0.648)	-0.886 (0.649)
Forfar			16.253 (3,956.180)	16.266 (3,956.180)
Haddington			1.195 (0.866)	1.200 (0.867)
Inverness			-0.290 (1.328)	-0.281 (1.328)
Kinross			15.364 (3,956.180)	15.272 (3,956.180)
Kirkcudbright			-0.105 (0.907)	-0.099 (0.908)
Lanark			-2.199*** (0.771)	-2.211*** (0.774)
Linlithgow			-1.204 (1.415)	-1.184 (1.412)
Orkney			1.089 (1.127)	1.091 (1.128)
Peebles			-1.718 (1.079)	-1.727 (1.085)
Perth			0.224 (0.764)	0.229 (0.765)
Renfrew			-2.290*** (0.569)	-2.297*** (0.571)
Ross			-1.847** (0.844)	-1.868** (0.850)
Selkirk			-18.398 (3,956.180)	-18.390 (3,956.180)
Shetland			16.253 (1,978.090)	16.266 (1,978.090)
Stirling			-2.375*** (0.730)	-2.375*** (0.732)
Wigtown			15.204 (2,336.375)	15.282 (2,401.921)
Constant	0.744*** (0.145)	0.738*** (0.145)	1.313*** (0.432)	1.300*** (0.433)
Observations	371	371	365	365
Log Likelihood	-188.582	-188.480	-141.346	-141.134
Akaike Inf. Crit.	387.164	388.959	346.692	348.269
Note:				*p<0.1; **p<0.05; ***p<0.01

Appendix 4: Logit models to examine the mechanism regarding confession

	Dependent variable:	
	Confession	Mentioned As Witch
	(1)	(2)
Torture	0.930 (0.616)	
Confession		0.721 (1.419)
Constant	-0.747*** (0.112)	-5.525*** (1.002)
Observations	375	375
Log Likelihood	-236.150	-12.336
Akaike Inf. Crit.	476.300	28.671
Note:		*p<0.1; **p<0.05; ***p<0.01

Appendix 5: Logit model to examine the relationship between guilty propensity and names using initials of first names

	Dependent variable:
	guilty
mentionedaswitch_e	15.469 (1,525.627)
confession_e	2.079*** (0.404)
torture_e	0.252 (0.858)
sexMale	-0.541 (0.443)
firstname_iB	0.356 (0.682)
firstname_iC	1.263 (1.152)
firstname_iD	-1.469 (1.408)
firstname_iE	0.212 (0.632)
firstname_iF	-16.567 (2,399.545)
firstname_iG	0.519 (0.979)
firstname_iH	0.489 (0.799)
firstname_iI	0.472 (0.674)
firstname_iJ	0.001 (0.495)
firstname_iK	1.423 (0.874)
firstname_iL	16.312 (1,681.189)
firstname_iM	-0.259 (0.517)
firstname_iN	-0.543 (1.482)
firstname_iP	16.565 (1,696.734)
firstname_iR	-1.041 (1.716)
firstname_iT	0.699 (1.014)
firstname_iU	-1.583 (1.672)
firstname_iV	15.277 (1,557.496)
firstname_iW	-0.001 (1.535)
Constant	0.543 (0.443)
Observations	371
Log Likelihood	-180.098
Akaike Inf. Crit.	408.197
Note:	*p<0.1; **p<0.05; ***p<0.01

Appendix 6: Logit model to examine the relationship between guilty propensity and names using initials of last names

	Dependent variable:
	guilty
mentionedaswitch_e	15.065 (1,570.757)
confession_e	1.962*** (0.381)
torture_e	0.107 (0.840)
sexMale	-0.520 (0.353)
lastname_iB	-0.078 (0.951)
lastname_iC	-0.230 (0.911)
lastname_iD	-0.201 (1.013)
lastname_iE	-0.294 (1.179)
lastname_iF	-0.811 (1.056)
lastname_iG	-0.190 (0.962)
lastname_iH	-1.034 (0.966)
lastname_iI	-0.781 (1.543)
lastname_iJ	-0.567 (1.486)
lastname_iK	-0.356 (1.208)
lastname_iL	-0.186 (0.952)
lastname_iM	-0.175 (0.910)
lastname_iN	0.751 (1.371)
lastname_iO	15.579 (1,385.378)
lastname_iP	-0.082 (1.170)
lastname_iR	-0.524 (0.921)
lastname_iS	-0.202 (0.932)
lastname_iT	-0.090 (1.068)
lastname_iU	-0.781 (1.543)
lastname_iV	13.617 (2,399.545)
lastname_iW	-0.652 (0.975)
lastname_iY	15.579 (1,385.378)
Constant	0.987 (0.823)
Observations	371
Log Likelihood	-184.471
Akaike Inf. Crit.	422.943
Note:	*p<0.1; **p<0.05; ***p<0.01

Appendix 7: Logit model to examine the relationship between guilty propensity and names using ends of first names

	Dependent variable:
	guilty
mentionedaswitch_e	12.652 (1,537.364)
confession_e	2.043*** (0.401)
torture_e	0.676 (0.918)
sexMale	-0.338 (0.427)
firstname_eA	-14.369 (1,696.735)
firstname_eD	-15.958 (1,696.735)
firstname_eE	-13.174 (1,696.734)
firstname_eG	1.518 (2,140.372)
firstname_eH	-14.304 (1,696.734)
firstname_eK	2.381 (2,399.545)
firstname_eL	-13.543 (1,696.734)
firstname_eM	-14.185 (1,696.735)
firstname_eN	-14.236 (1,696.734)
firstname_eO	0.338 (2,938.830)
firstname_eR	-15.207 (1,696.735)
firstname_eS	-13.956 (1,696.734)
firstname_eT	-13.700 (1,696.734)
firstname_eX	1.306 (2,306.134)
firstname_eY	-15.720 (1,696.735)
Constant	14.523 (1,696.734)
Observations	371
Log Likelihood	-179.313
Akaike Inf. Crit.	398.625
Note:	*p<0.1; **p<0.05; ***p<0.01

Appendix 8: Logit model to examine the relationship between guilty propensity and names using ends of last names

	Dependent variable:
	guilty
mentionedaswitch_e	30.679 (1,837.599)
confession_e	1.929*** (0.381)
torture_e	0.200 (0.868)
sexMale	-0.510 (0.369)
lastname_eA	-0.510 (3,393.469)
lastname_eB	-0.241 (2,929.955)
lastname_eD	-16.200 (2,399.545)
lastname_eE	-16.227 (2,399.545)
lastname_eF	-2.439 (3,393.469)
lastname_eG	-16.601 (2,399.545)
lastname_eH	-15.432 (2,399.545)
lastname_eK	-16.374 (2,399.545)
lastname_eL	-16.917 (2,399.545)
lastname_eM	-17.006 (2,399.545)
lastname_eN	-16.159 (2,399.545)
lastname_eO	-17.786 (2,399.545)
lastname_eP	-16.630 (2,399.545)
lastname_eR	-16.157 (2,399.545)
lastname_eS	-16.527 (2,399.545)
lastname_eT	-16.672 (2,399.545)
lastname_eW	-32.415 (2,728.772)
lastname_eX	-2.439 (3,393.469)
lastname_eY	-16.443 (2,399.545)
Constant	17.076 (2,399.545)
Observations	371
Log Likelihood	-183.901
Akaike Inf. Crit.	415.802
Note:	*p<0.1; **p<0.05; ***p<0.01

Appendix 9: Logit model to examine the relationship between guilty propensity and other variables

	Dependent variable:
	guilty
mentionedaswitch_e	17.776 (9,818.559)
confession_e	1.833** (0.713)
torture_e	-1.503 (1.077)
sexMale	-0.550 (0.546)
unorthodoxrelpract_p	
unorthodoxrelpract_s	-1.095 (1.296)
consulting_p	-29.776 (7,402.226)
consulting_s	-2.976** (1.373)
demonic_p	17.810 (3,128.154)
demonic_s	-1.062 (0.654)
demonic_possess_p	47.350 (4,388.537)
demonic_possess_s	-52.419 (4,388.537)
fairies_p	14.354 (6,824.533)
fairies_s	-1.691 (1.948)
folk_healing_p	16.221 (2,111.094)
folk_healing_s	2.744 (1.975)
maleficium_p	-0.427 (1.122)
maleficium_s	1.207 (0.816)
midwifery_p	
midwifery_s	16.817 (4,617.699)
implicatedbyanother_p	15.718 (7,186.692)
implicatedbyanother_s	1.169** (0.566)
neighbhd_dispute_p	0.148 (1.110)
neighbhd_dispute_s	-1.515 (1.193)
politicalmotive_p	26.782 (10,064.080)
politicalmotive_s	-2.846 (2.387)
propertymotive_p	0.440 (2.355)
propertymotive_s	-1.114 (1.524)
refusedcharity_p	27.507 (11,466.920)
refusedcharity_s	-0.276 (1.681)
treason_p	-50.386 (13,864.930)
treason_s	15.273 (3,962.873)
other_p	-47.936 (19,213.510)
other_s	50.848 (19,213.510)
whitemagic_p	
whitemagic_s	2.099* (1.254)
witchesmeeting	-0.021 (1.782)
devilpresent	0.199 (1.814)
maleficium	20.042 (3,494.498)
communalsex	-37.713 (18,447.170)
devilworship	16.346 (5,012.964)
foodanddrink	15.181 (3,697.668)
dancing	0.496 (1.286)
singing	16.793 (4,517.538)
elphane_fairyland	5.072** (2.234)
food_drink	-17.741 (9,400.886)
specificverbalformulae	0.985 (1.320)
specificritualacts	-0.904 (1.093)
familiars	1.666 (1.895)
shape_changing	0.038 (1.168)
dreams_visions	17.763 (4,341.076)
unorthodoxreligiouspractice	
sympatheticmagic	1.642 (1.141)
ridingdead	-6.063 (8,374.144)
humanillness	-0.949 (0.862)
humandeath	-0.769 (0.833)
animalillness	0.248 (1.152)
animaldeath	-0.683 (1.051)
femaleinfertility	15.977 (17,730.370)
maleimpotence	0.483 (2.354)
aggravatingdisease	14.967 (6,915.108)
transferringdisease	-0.153 (1.534)
layingon	1.695 (1.192)
removalbewitchment	-2.184 (1.688)
quarreling	1.131 (1.314)
cursing	0.602 (1.071)
poisoning	0.154 (3.562)
rechealer	16.068 (1,983.711)
healinghumans	-3.525** (1.640)
healinganimals	0.809 (1.875)
midwifery	-0.917 (1.894)
Constant	0.921*** (0.256)
Observations	371
Log Likelihood	-107.913
Akaike Inf. Crit.	351.825
Note:	*p<0.1; **p<0.05; ***p<0.01