Introduction

In most of Europe, health care is a pillar of the welfare state. However, in many countries, this system is under strong stress. Population ageing is increasing the cost, at the same time also medical progress and technological innovation are exponentially raising the cost of treatments. (Newhouse, 1992)

Clearly, there is a need for significant investment in the health care system. Yet, this topic often struggles to find space in political debates compared to more divisive or symbolic issues, which politicians frequently exploit to consolidate their consensus.

Another crucial characteristic of this sector is the difficulty in objectively evaluating the quality of a health system. Citizens often rely on personal experiences, which may depend more on the kindness of the staff than on the actual medical effectiveness of the treatment.

If most people cannot technically evaluate the health care system, what contributes to the creation of their opinion?

My thesis proposes that a positive and significant relationship exists between trust in institutions and satisfaction with the healthcare system. Specifically, individuals with higher trust in political institutions tend to express greater satisfaction with public health services. I argue that health care is perceived as a direct output of institutions: if citizens trust the political institutions, they are more likely to assume that public money is invested wisely and, consequently, perceive the health care system as efficient.

To explore these dynamics, I have chosen to analyse the United Kingdom context. Since, in the last few years, institutional and political trust has fluctuated significantly due to Brexit, the resulting political instability and COVID-19, which contribute on the fluctuation of political trust and stress the healthcare system. (Davies, et al., 2021) This context provides an ideal setting to verify my hypothesis.

The UK is also characterised by a tax-funded health system; this creates a direct link between political institutions and the healthcare system. For all these reasons, the UK offers a unique 'natural laboratory' for this analysis.

RQ*: To what extent does trust in the national parliament affect citizen satisfaction with the public health system in the United Kingdom?*

Null hypotheses*: There is no statistically significant relationship between trust in the national parliament and satisfaction with the healthcare system. Any observed variance is due to chance.*

***Hypothesis**: There is a positive and significant relationship between trust in the national parliament and satisfaction with the healthcare system. Individuals with higher trust in political institutions are more likely to express higher satisfaction with public health services.*
***Second hypothesis**: The positive relationship between institutional trust and healthcare satisfaction is moderated by political ideology.*

Litterature review

Institutional political trust is fundamental for the stability and prosperity of a country. This is why it's crucial to understand what influences this indicator. The classical theory, often associated with David Easton (Easton, 1975), suggests that political trust is made up of the sum of specific and diffuse support. The specific support is conditioned by those who are governing in that particular moment, and it arises from the satisfaction with outputs (decisions, policies, actions) and the performance of the government. It is quite unstable and fluctuates significantly.

In contrast, diffuse support is more stable because it depends on how much citizens trust the political system; it is directed to the regime (the institutions, the constitution) and the political community, not towards the people who govern temporarily. Easton says that diffuse support could also decline if there is a prolonged lack of positive output (performance failure). (Easton, 1975)

Healthcare, especially in nations where it is tax-funded, could be seen as an output; therefore, based on this theory, if politicians cut healthcare and people don't support it, they can lose specific support. However, if this translates into a systemic and lower quality of services, there could also be a decrease in diffuse support. As clearly emerges from this theory, political trust is shaped by various factors that interact in a quite complicated way

Kumlin described how negative experiences in public services, such as schools or hospitals, could reduce trust in institutions. In this theory, there are three mechanisms through which personal experience influences political opinions:

- Self-interest: people support policies that most benefit themselves. This is a straightforward idea: citizens agree with decision-makers who provide the most favourable or materially beneficial outcomes for their personal situation.
- Distributive Justice: This second mechanism explains that citizens give positive feedback to policies that appear fair. They do not only want to be the only category that benefits, but rather prefer a model based on a correct distribution of resources.

- Procedural Justice: It focuses on the interaction between citizens and the state. Kumlin thinks that a fair system is based on the possibility for citizens to express their opinions and to influence the decision-making process.

Based on a Swedish survey, personal experience strongly influences people's feedback about the quality of services and, consequently, their political views and trust in political institutions. Kumlin developed this theory by questioning previous theories; his insight was that people often lack the tools (such as clear macro-indicators) to evaluate the complexity of welfare state institutions. Unlike in the economic realm, where people use economic indices, citizens lack similar, clear data for service quality. Therefore, Kumlin explains that citizens rely more on direct personal experiences to form their opinions. (Kumlin, 2002)

Theory

Steven Van de Walle & Geert Bouckaert challenge the traditional theory based on the idea that "better performing public services will lead to increased satisfaction among their users, and this, in turn, will lead to more trust in government". (Bouckaert, 2007)

They created five models that explain the dynamics between institutional trust and the quality of public services:

- Disconnection: In some countries, there has been a privatisation of public agencies. People may not perceive that public services are part of the government, so an improvement in services would not translate into an increase in political trust.
- Dominant Impact: Different agencies have varying impacts, with some being perceived as more significant than others. Higher performance in one of these key agencies will generate a stronger positive impact on political trust.
- Multiple Influences: Citizens' trust is influenced by a wide range of factors, including ideology, political affiliation, and perceived identity.
- Reversed Causality: A general distrust in government can negatively influence the perception of public services. For example, a generalised negative opinion of the political class may lead citizens to evaluate public services more harshly.
- Moderate Reversed Causality: This dynamic explains that even if there are negative stereotypes about institutions, citizens are still able to independently evaluate the quality of services.

Based on these models, the connection between institutional trust and perceptions of public service is multifactorial. My theoretical framework will be based on the 4th model: trust in

institutions could influence citizens' opinions about public services. In this research, I won't analyse opinions about all public services; I will only explore satisfaction with the healthcare system, since it is one of the most essential public services that people use, directly or indirectly. Inefficiency in this service could produce strong negative feelings. At the same time, it is extremely complex to identify inefficiency in the healthcare system. Since it relies on a substantial budget, budgetary cuts could take years to produce an effect; furthermore, a cut might involve, for example, advanced machinery or medical techniques that most people are unaware of. So, based on what people trust or not the healthcare system's performance?
I hypothesise that based on the trust in political institution, people build their opinion on most of the public services. The second hypothesis is that political ideology acts as a moderator. I suppose that based on the different ideology the relation between political trust and the healthcare system varies in strength depending on the individual's ideological orientation. Rudolph and Evans said that "Consistent with the unbalanced ideological costs imposed by requests for increased government spending, we find that the effects of political trust are significantly more pronounced among conservatives than among liberals." (Rudolph & Evans, 2005, p. 660) and they continued saying "This result, which is not limited to this issue, implies that increases in political trust are sometimes sufficient to overcome ideological differences in support for government spending. Indeed, the likelihood of supporting increased spending among high-trust conservatives exceeds or approaches the likelihood of such support among low-trust liberals on several other issues, including Medicaid, health care, education, and the environment." (Rudolph & Evans, 2005, p. 668) Based on the level of trust, on the topic and on the ideology, the support changes. This could apply to this topic, for example, if conservatives think that the expense on health is eccessive they will not trust the healthcare system, but conservatives with a high level of trust are going to support it more than the liberals, based on the cited research.

Data and method

Introduction

The dataset employed for this analysis is the European Social Survey Round 11. (ESS-11, 2023) The ESS is a cross-national survey; the latest round, the 11th, was released in 2023, with a specific focus on gender and health inequalities. For this analysis, I will use institutional trust measures and several socio-demographic variables. The statistical analysis and all visualisations will be conducted using R software.

As previously described, the study focuses on the UK sub-sample. In ESS Round 11, the total number of observations for the UK is 1684.

Analysis

This study aims to explore the primary relationship between institutional trust (the independent variable) and satisfaction with the healthcare system in the UK. Initially, a bivariate analysis will be conducted to assess the direct association between these two main variables.

The study will then employ a multiple linear regression analysis to account for potential rival explanations. The goal is to isolate the specific effect of institutional trust on healthcare satisfaction by controlling for the confounding variables, such as socio-demographic factors. (Aneshensel, 2002)

The final stage of the analysis incorporates a moderation effect. Specifically, political orientation will be introduced as a moderator to investigate whether the relationship between institutional trust and healthcare satisfaction is conditional upon an individual's political views.

Variables

The dataset was first cleaned by recoding the numerical values that the codebook identifies as missing. Subsequently, I operationalised the following variables to explore the focal relationship between institutional trust and satisfaction with healthcare services.

Variables	Operationalisation
Focal variables	
Institutional trust index 1. trstprl 2. trstplt 3. trstprt	Trust in country's parliament Trust in politicians Trust in political parties Scale 0(low trust) – 10(high trust)
Opinion about health system stfhlth	State of health services in country nowadays Scale 0(bed) – 10 (good)
Control variables	
Age	agea Years old (continuous)
Gender	gndr 1: Male 2: Female
Born in UK	brncntr 1: yes 2: no

Education	eduyrs Years of education (continuous)
Income	hinctnta Scale 1(1st decile) – 10 (10th decile)
Health condition	health Scale 1 – 5
Happiens index	happy Scale 0 – 10
Moderator variable	
Left/Right opinion	lrscale Scale 0 (left) – 10 (right)

Table 1. Operationalisation of the variables

Dependent variable

The focal dependent variable of this study is the "State of health services in the country nowadays" (stfhlth). This variable is derived from the question: "Please say what you think overall about the state of health services in [country] nowadays?". The level of satisfaction with the health system is measured on a scale from 0 to 10, ranging from the lowest to the highest level of satisfaction. Figure 1 presents a histogram showing the distribution of our dependent variable.

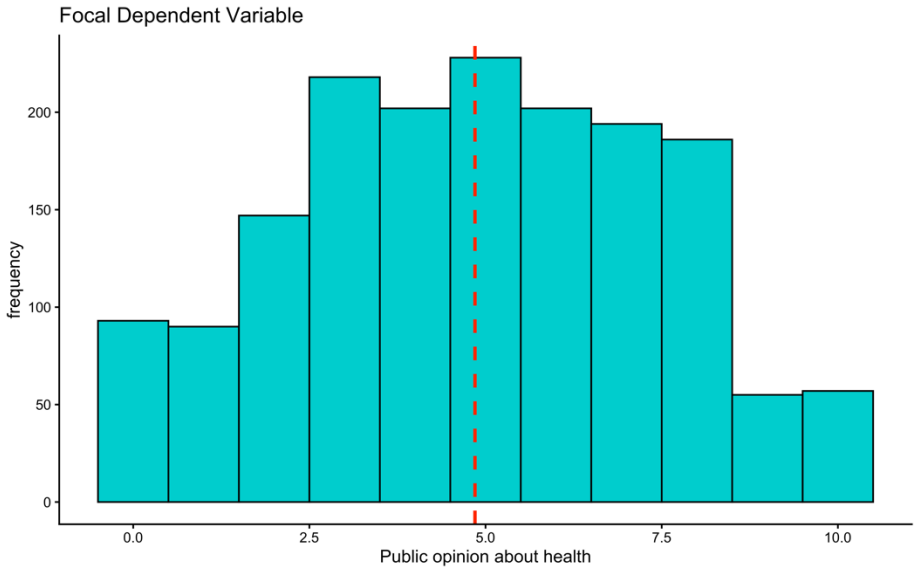

Figure 1. Dependent variable

Independent variable

The primary independent variable is institutional trust. Three specific indicators from the ESS were selected to construct this variable: trust in the national parliament, trust in politicians, and trust in political parties. The logic behind aggregating these measures is that individual indicators can be influenced by external, idiosyncratic factors; for instance, a charismatic

leader might temporarily boost trust in politicians, while a specific legislative reform might impact trust in parliament. To capture the underlying trend of political support and reduce the noise of individual events, these three indicators were aggregated into a composite "Institutional Trust" index.

All three indicators are measured on a 0-10 scale, derived from the question: "Please tell me on a scale of 0-10 how much you personally trust each of the institutions I read out." The index was calculated by taking the arithmetic mean of the three variables. With a Cronbach's alpha of 0.91, the index demonstrates excellent internal consistency, confirming its reliability for this study. Figure 2 illustrates the distribution of the institutional trust index alongside the years of education.

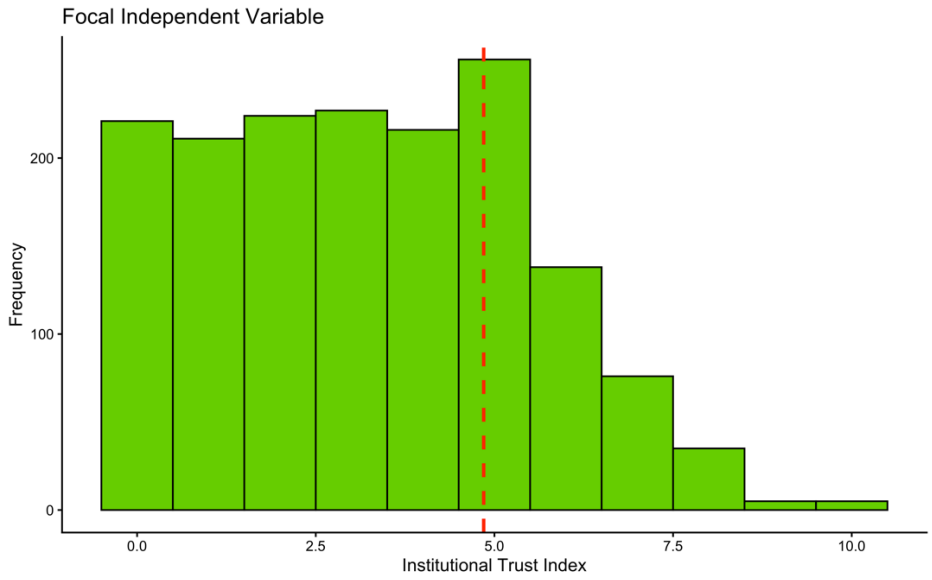

Figure 2. Indipendent variable

Confounders

To isolate the effect of the independent variable and control for potential confounding factors that could lead to spurious correlations, the following variables were introduced:

1. Subjective Well being (happy): This measures general happiness. Individuals with a more positive disposition might consistently report higher scores across all survey items. Temperament and personality stably influence the happiness score (Diener & Lucas, 2012); at the same time, they can influence how they perceive all the other life circumstances.
2. Gender (gndr): A standard demographic control. In this context, it accounts for potential differences in healthcare evaluation patterns between men and women, which

may stem from gender-specific socialisation or differing life experiences. Women tend to use the health care system. (Bertakis & Azari, 2000) This could influence how they experience it and, consequently, their opinion about it.

3. Household Income (hinctnta): This variable categorises respondents by socio-economic status. Higher-income individuals may rely on private healthcare, meaning their lack of negative feedback might stem from non-use of public services rather than actual satisfaction. It was found that there was a marginal association between social status and satisfaction in medical care. (Hall & Dornan, 1990) Furthermore, socio-economic success often correlates with a more favourable view of the status quo.
4. Self-Reported Health (health): This is a critical control, as those in poorer health interact more frequently with the healthcare system. R. Crow states that poor physical health status is often associated with a low level of satisfaction. (Crow, Gage, Hampson, Hart, & Kimber, 2003) Their evaluations might be influenced by the burden of their condition or by the higher stakes of their medical encounters.
5. Age (agea): Older individuals generally have a higher demand for healthcare services. Additionally, age can capture cohort effects, where different generations develop distinct levels of institutional trust due to the political and cultural climate in which they were raised.
6. Education (eduyrs): Education is a powerful predictor in the social sciences. It influences cognitive mobilisation, the ability to understand complex institutional functions, which shapes trust. Moreover, highly educated individuals may possess a more critical perspective, allowing them to better identify systemic shortages or inefficiencies in healthcare provision.

Results

Bivariate analysis

The first model in this analysis comprises a bivariate regression between the independent and dependent variables. Figure 3 illustrates this relationship, showing a positive association between institutional trust and satisfaction with the healthcare system.

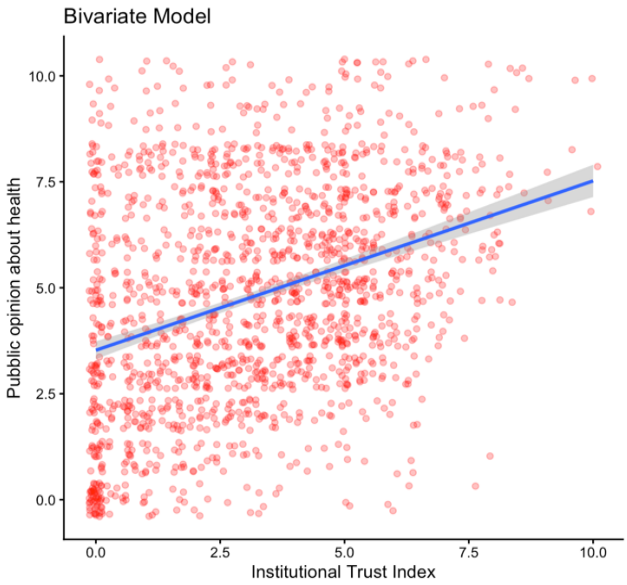

Figure 3. Bivariate model

Table 2 summarizes the linear regression results, which indicate a strong and statistically significant relationship ($p < 0.001$). Specifically, for each unit increase in institutional trust, healthcare satisfaction increases by approximately 0.40 units. This model accounts for 11.7% of the total variance, providing a solid starting point for the bivariate analysis.

Bivariate Model: political trust and opinion about healthcare (N = 1608)

Variable	Beta[1]	SE	95% CI	P
(Intercept)	3.5***	0.107	3.3, 3.7	<0.001
Institutional trust	0.40***	0.027	0.35, 0.45	<0.001
Adjusted R^2	0.117			

[1] *p<0.05; **p<0.01; ***p<0.001

Abbreviations: CI = Confidence Interval, SE = Standard Error

Table 2. Bivariate model

Exclusionary Strategy

The analysis proceeds by applying the exclusionary strategy. By employing multiple regression, it is possible to explore the extent to which each confounder impacts the focal relationship, thereby testing for a potential spurious association between the focal variables

after accounting for the confounders. In this multiple regression, all seven control variables described in the previous section are included.

Exclusionary Strategy: Model with control variables (N = 1130)

Variable	Beta[1]	SE	95% CI	P
(Intercept)	4.0***	0.527	2.9, 5.0	<0.001
Institutional trust	0.36***	0.033	0.30, 0.43	<0.001
Age	0.00	0.004	-0.01, 0.01	0.6
Gender	-0.43**	0.134	-0.69, -0.16	0.001
Not born in UK	0.25	0.194	-0.13, 0.63	0.2
Years of Education	-0.06**	0.018	-0.09, -0.02	0.002
Income	-0.11***	0.025	-0.16, -0.06	<0.001
Health condition	-0.03	0.079	-0.19, 0.12	0.7
Happiness	0.16***	0.038	0.08, 0.23	<0.001
Adjusted R^2	0.168			

[1] *p<0.05; **p<0.01; ***p<0.001

Abbreviations: CI = Confidence Interval, SE = Standard Error

Table 3. Second model: control variables

This second model explains 16.8% of the total variance of the dependent variable; the R^2 value increased, indicating that additional variance is linked to the control variables. As indicated in the table, four confounders and the focal independent variable have a p-value smaller than 0.05. This means that these variables are statistically significant and that they are associated with the dependent variable. The focal independent variable (institutional trust) maintains a strong and positive relationship ($\beta = 0.36$); at the same time, gender, years of education, and income have an inverse relationship and are statistically significant ($p<0.05$). Happiness is the only control variable that is statistically significant with a positive association. Age, being born in the UK, and self-reported health do not significantly influence the outcome.

This analysis confirms that while the confounders have an impact on the model, the focal association shown in the bivariate analysis persists. This suggests that the relationship is robust and not merely a spurious result.

Moderator

The third model introduces the left and right ideological scale as a moderator. This implies that the relationship between the main variables is hypothesised to be conditional upon the respondent's political orientation. This moderator is employed to test whether the relationship strengthens or weakens within certain ideological categories.

The Adjusted R^2 of this model is 0.160, representing a slight decrease from the 0.168 reported in the previous model. This indicates that the inclusion of the interaction term does not improve the model's explanatory power. The interaction between institutional trust and the left-right scale is not statistically significant, with a P-value of 0.3. Consequently, the model fails to capture a more nuanced dynamic. Instead, it appears to introduce unnecessary complexity, as evidenced by the decrease in the Adjusted R^2.

Model with control variables and moderator (N = 1012)

Variable	**Beta**[1]	**SE**	**95% CI**	**P**
(Intercept)	4.0***	0.612	2.8, 5.2	<0.001
Institutional trust	0.27**	0.084	0.11, 0.44	0.001
Left-Right Scale	0.00	0.058	-0.11, 0.12	>0.9
Age	0.00	0.004	-0.01, 0.01	>0.9
Gender	-0.34*	0.140	-0.61, -0.06	0.016
Not born in UK	0.08	0.204	-0.32, 0.48	0.7
Years of Education	-0.05**	0.019	-0.09, -0.02	0.005
Income	-0.11***	0.026	-0.16, -0.05	<0.001
Health condition	0.00	0.082	-0.16, 0.16	>0.9
Happiness	0.15***	0.040	0.07, 0.23	<0.001
Institutional trust * Left-Right Scale	0.02	0.015	-0.01, 0.05	0.3
Adjusted R^2	0.160			

[1] *p<0.05; **p<0.01; ***p<0.001

Abbreviations: CI = Confidence Interval, SE = Standard Error

Table 4. Third model: moderator

Discussion

This quantitative inquiry consisted of three distinct stages of analysis. The initial bivariate analysis revealed a positive association between the independent variable, institutional trust,

and the dependent variable, satisfaction with the healthcare system. Subsequently, the study adopted an exclusionary strategy to mitigate the risk of spuriousness. The second model, a multiple regression including six covariates, demonstrated improved explanatory power, as evidenced by the increase in Adjusted R^2. Among the six confounders, four were found to be statistically significant: gender, years of education, income, and happiness. Crucially, the independent variable remained statistically significant, suggesting that the focal relationship persists even after controlling for these factors.

The final stage of the analysis involved a multiple regression with a moderator to determine if the focal relationship varied in intensity based on the left-right ideological scale. This moderator did not yield statistically significant results and instead increased the model's complexity without adding explanatory value; the third model presented a lower Adjusted R^2 than the second, indicating that the interaction term introduced unnecessary noise.

The initial hypothesis was therefore confirmed, revealing a robust and positive relationship. The multiple regression identified the magnitude of this association: the intercept of the model indicates that when institutional trust is zero, healthcare satisfaction begins at a value of four. Furthermore, for every unit increase in the independent variable, healthcare satisfaction increases by approximately 0.36.

In conclusion, these findings suggest that institutional trust exerts a significant effect on satisfaction with the healthcare system. However, a possibility that this analysis can neither confirm nor exclude, and which warrants further investigation, is the existence of a reciprocal cycle, where both variables actively influence each other in a feedback loop. Furthermore, it’s possible to reject the second hypothesis, since the model that integrated the moderator variable wasn’t statistically significant.

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Appendix

```
#Set up the working library
install.packages("tidyverse")
install.packages("psych")
install.packages("ggplot2")
install.packages("skimr")
install.packages("visreg")
install.packages("stargazer")
install.packages("sjPlot")
install.packages("car")
install.packages("gtsummary")

library(tidyverse)
library(psych)
library(ggplot2)
library(skimr)
library(visreg)
library(stargazer)
library(sjPlot)
library(car)
library(gtsummary)



#upload the dataset
ESS11data <- read_csv("ESS11e04_0.csv", show_col_types = FALSE)

#Filter UK subdataset
ESS11_GB <- ESS11data %>%
  filter(cntry == "GB")

#Select and rename variables
ESS11_GB <- ESS11_GB %>%
  select(age = agea,
         gender = gndr,
```

```
        born_GB = brncntr,
        education = eduyrs,
        income = hinctnta,
        health,
        happy,
        trstprl,
        trstplt,
        trstprt,
        stfhlth,
        lrscale)

#Manually code missing values as NA
ESS11_GB <- ESS11_GB %>%
  mutate(age = if_else(age %in% c(99, 999), NA, age),
        gender = na_if(gender, 9),
        born_GB = if_else(born_GB %in% c(7, 8, 9), NA, born_GB),
        education = if_else(education >= 77, NA, education),
        income = if_else(income >= 77, NA, income),
        health = if_else(health %in% c(7, 8, 9), NA, health),
        happy = if_else(happy >= 77, NA, happy),
        trstprl = if_else(trstprl >= 77, NA, trstprl),
        trstplt = if_else(trstplt >= 77, NA, trstplt),
        trstprt = if_else(trstprt >= 77, NA, trstprt),
        stfhlth = if_else(stfhlth > 11, NA, stfhlth),
        lrscale = if_else(lrscale >= 77, NA, lrscale))

#Mutate variables
ESS11_GB <- ESS11_GB %>%
  mutate(age = as.numeric(age),
        gender = as_factor(gender),
        born_GB = as_factor(born_GB),
        education = as.numeric(education),
        income = as.numeric(income),
        health = as.numeric(health),
```

```
        happy = as.numeric(happy),
        trstprl = as.numeric(trstprl),
        trstplt = as.numeric(trstplt),
        trstprt = as.numeric(trstprt),
        stfhlth = as.numeric(stfhlth),
        lrscale = as.numeric(lrscale))

#create index
ESS11_GB <- ESS11_GB %>%
  mutate(trst_index = ((trstprl + trstplt + trstprt)/3))

#test to verify the index
index_institution <- data.frame(ESS11_GB$trstprl,
                        ESS11_GB$trstplt,
                        ESS11_GB$trstprt)
alphatest <- alpha(index_institution)
summary(alphatest)
#results raw_alpha 0.91, it is reliable


#overview all data informations
skim(ESS11_GB)


#number of missing variables
sum(is.na(ESS11_GB))

#graphs for focal variables
# Plot focal X
tiff("Institutional Trust Index.tiff", units="in", width=8, height=5, res=600)
ggplot(ESS11_GB, aes(trst_index)) +
  geom_histogram(binwidth = 1, color="black", fill="chartreuse3") +
  geom_vline(xintercept=mean(ESS11_GB$stfhlth,na.rm=TRUE), col="red", lwd=1,
             linetype="dashed") +
```

```
  theme_classic() +
  ggtitle("Focal Independent Variable") +
  xlab("Institutional Trust Index") + # # riguarda cosa scriverci AAA ELIMINA NOTA
  ylab("Frequency") # # riguarda cosa scriverci AAA ELIMINA NOTA
dev.off()

# Summary stats for focal X
summary(ESS11_GB$trst_index)

# Plotting focal Y
tiff("Pubblic opinion about health.tiff", units="in", width=8, height=5, res=600)
ggplot(ESS11_GB, aes(stfhlth)) +
  geom_histogram(binwidth = 1, color="black", fill="cyan3") +
  geom_vline(xintercept=mean(ESS11_GB$stfhlth,na.rm=TRUE), col="red", lwd=1,
             linetype="dashed") +
  theme_classic() +
  ggtitle("Focal Dependent Variable") +
  xlab("Public opinion about health") +
  ylab("frequency") # riguarda cosa scriverci AAA ELIMINA NOTA
dev.off()

# Summary stats for focal Y
summary(ESS11_GB$stfhlth)

#Plot bivariate relationship
tiff("Bivariate analysis.tiff", units="in", width=8, height=5, res=600)
ggplot(ESS11_GB, aes(x=trst_index,
                     y= stfhlth)) +
  geom_jitter(alpha=0.3, color="red") +
  geom_smooth(method = "lm", se=TRUE)+
  theme_classic() +
  ggtitle("Bivariate Model") +
  xlab("Institutional Trust Index") +
  ylab("Pubblic opinion about health")
```

```
dev.off()

#regressions models
#bivariate analysis
model1 <- lm(stfhlth ~ trst_index,
             data = ESS11_GB)
summary(model1) #info about the model
par(mfrow = c(2, 2)) #with this I can see all the 4 graphs together
plot(model1)
par(mfrow = c(1, 1)) # at the end I reset

#table bivariate relationship
table1 <- tbl_regression(model1, label = trst_index ~ "Institutional trust",
                         intercept = TRUE) %>%
  add_glance_table(include = c(adj.r.squared)) %>%
  modify_header(label = "**Variable**", p.value = "**P**") %>%
  add_significance_stars(hide_ci = FALSE, hide_p = FALSE) %>%
  modify_caption("**Bivariate Model: political trust and opinion about healthcare** (N =
{N})") %>%
  as_gt() %>%
  gt::tab_options(table.font.names = "Times New Roman")
print(table1)
gt::gtsave(table1, file = "Table1_Bivariate.png")

#Add to the model the control variables
model2 <- lm(stfhlth ~ trst_index +
               age +
               gender +
               born_GB +
               education +
               income +
               health +
               happy,
             data = ESS11_GB)
```

```
summary(model2) #info about the model

#I didn't create dummy variables because in my analysis it was useless and it makes me lose some important information about control varaibles

#table control variables
table2 <- tbl_regression(model2,intercept = TRUE,
                         label = c(trst_index ~ "Institutional trust", education = "Years of Education", gender = "Gender",
                                   age = "Age", born_GB = "Not born in UK", income= "Income",
                                   health = "Health condition", happy = "Happiness"),
                         show_single_row = c("gender", "born_GB")) %>%
  add_glance_table(include = c(adj.r.squared)) %>%
  add_significance_stars(hide_ci = FALSE, hide_p = FALSE)%>%
  modify_header(label = "**Variable**", p.value = "**P**") %>%
  modify_caption("**Exclusionary Strategy: Model with control variables** (N = {N})")%>%
  as_gt() %>%
  gt::tab_options(table.font.names = "Times New Roman")
print(table2)
gt::gtsave(table2, file = "Table2_Exclusionary.png")

#model with moderator
model3 <- lm(stfhlth ~ trst_index * lrscale +
               age +
               gender +
               born_GB +
               education +
               income +
               health +
               happy,
             data = ESS11_GB)
summary(model3) #info about the model
# political opinion is not a moderator because the p-value is too high
```

```
table3 <- tbl_regression(model3,intercept = TRUE,
                         label = c(trst_index ~ "Institutional trust", education = "Years of Education",
gender = "Gender",
                                   age = "Age", born_GB = "Not born in UK", income= "Income",
                                   health = "Health condition", happy = "Happiness", lrscale = "Left-Right
Scale"),
                         show_single_row = c("gender", "born_GB")) %>%
  add_glance_table(include = c(adj.r.squared)) %>%
  add_significance_stars(hide_ci = FALSE, hide_p = FALSE)%>%
  modify_header(label = "**Variable**", p.value = "**P**") %>%
  modify_caption("**Model with control variables and moderator** (N = {N})")%>%
  as_gt() %>%
  gt::tab_options(table.font.names = "Times New Roman")
print(table3)
gt::gtsave(table3, file = "Table3_Control.png")


#search the outliers
#Display the cases with the highest numbers of Cook's D
CooksD <- cooks.distance(model2) #
sort(CooksD, decreasing = TRUE) %>% head() #Top 6 of the outlier
#there weren't any outlier that was too problematic

#Linearity
plot(model2, which = 1)

#Homogeneity of variance
plot(model2, which = 3)

#Normality of the residuals
plot(model2, which = 2)

par(mfrow = c(2, 2)) #with this I can see all the 4 graphs together
```

```
plot(model2)
par(mfrow = c(1, 1))
```