# Dynamics of Social Progress:
# Focusing on the Effect of the Level of Life Satisfaction on Individuals' Attitudes

## Abstract

Our thoughts have gradually changed according to a living environment. During the process of thought change, or the selective adaptation process of thoughts, there always occurs discordance among people due to their different timing of accepting the new thoughts. This study basically tried to find the cause of the timing gap. To this end, this study, first, confirmed an event which could be considered as an on-going examples of changing living environment in our era. As a result, it identified that homosexual sex relationship was the most active and debatable issue nowadays. With the issue, in next stage, this study conducted a mixed-effect cohort analysis and found that cohorts that were more satisfied with their life tended to have more favorable stance towards the homosexual sex relations. That is, the level of life satisfaction can be a key factor deciding individuals' timing to be liberal.

## 1. Introduction

What we believe right and what we accept as a norm to follow incessantly change. We have observed that numerous philosophies, theories, or institutions which we had once adopted or enshrined in our society disappeared into history as a new wave of thoughts spread through the whole society. From the perspective of Social Darwinism, this replacement is a process of selective adaptation in which the fittest habits of thought replace old and no-more-fitting customs, and through which society gradually achieves social progress.

During the process, however, because every individual in society accepts a new habit of thought at their own timing and frequency, there must be always discordance among social members in terms of their lifestyle and values. Individuals who have a relatively conservative propensity tend to cling to the existing institutions and habits of thoughts and less welcome changes, while individuals who are progressive or liberal have the propensity to adapt themselves more quickly to the changing environment. In history, the discordance has often led to severe social conflicts and even wars, and society has progressed furtively and tardily as the discordance abates.

This study basically investigated the selective adaptation process of thoughts in our time. More specifically, this study tried to, first, identify key thoughts (or events) which are going through the locus of the discordance in our day, and then delve into the factors which might possibly cause the discordance. To this end, this study borrowed Thorstein Veblen's idea about the origin of the discordance, which, I think, provides a simple but plausible interpretation on the selective adaptation process of habits of thought. Although most details in his thoughts were addressed in the following section, let me briefly introduce it here. Veblen assumed that every human is innately conservative and wants to keep the status quo because changing something gives rise to cost and is a sort of "irksome toil" (Veblen [1899] 2013). Due to this propensity, our social system including individuals' lifestyles, customs, and institutions tends to stay the same. However, our living environment—such as climate, the level of technology, relationship with neighboring societies, etc.—continuously changes by the law of nature. Over time, the varying environment becomes no longer consistent with the static social system and starts to pressure society members to change their lifestyles and institutions in accordance with the new environment. This pressure continues until the existing social system is completely replaced with a new one which meets the

requirements of the new environment. In this process, Veblen emphasized that the pressure takes a form of "pecuniary exigencies" (Veblen [1899] 2013).

Based on his idea about social progress and extending the pecuniary exigencies, or economic difficulties, to more general difficulties in one's life, this study formulated a hypothesis that individuals, who are less satisfied not only with their financial status but also with their current lives, change their lifestyle more quickly to adapt themselves to a new environment than people who are more satisfied with their current status. To test the hypothesis, this study used the General Social Survey (GSS) data and designed a two separate stages of modeling methods. In the first stage, using a ridge regression approach, it identified the current ongoing events in which people showed the most remarkable contrast in their political orientation: either conservative or liberal. In other words, this stage was for looking for the most active changing thoughts in our time. In the second stage, it investigated how life satisfaction of individuals was associated with their attitude change in the social events found in the first stage, by using a mixed-effect cohort analysis. That is, the second stage was for testing the extended Veblen's thought. As a result of this study, homosexual relationship was the most noticeable ongoing issue in our time, and the level of life satisfaction was significantly related with one's attitudes towards those social issues.

In the following, this study first reviewed Veblen's idea more in detail and other relevant studies. After that, it explored the GSS data and conducted the hypothesis tests.

## 2. Literature Review

### 2.1 Social Darwinism and Veblen's thought

According to Veblen (2013), human life is an incessant process of selective adaptation. Through the selection process, only the fittest habits of thought can survive, and individuals, who

are innately conservative, are enforced to adapt themselves to the surviving thoughts which is to various extents perceived progressive (Hodgson 1992). This process at the individual level can be described in Figure 1. In the beginning, every individual is conservative. When the changing living environment forces them to change their lifestyle, some people rapidly adapt themselves to the new environment (liberals) while others adhere to the existing lifestyle and remain the same (conservatives). Facing the ceaseless pressure of change, all conservatives finally change their lifestyle and form a new conservative. The custom of slavery is a good example. Once a group of people called the conservatives supported slavery and fought against its abolition; however, the changing environment where equal human rights have become the fabric of our society demanded the conservative to change their lifestyle and they finally surrendered. If now someone made a proslavery argument, we wouldn't call them the conservative, but regard as an insane person.

Figure 1: Natural selection process
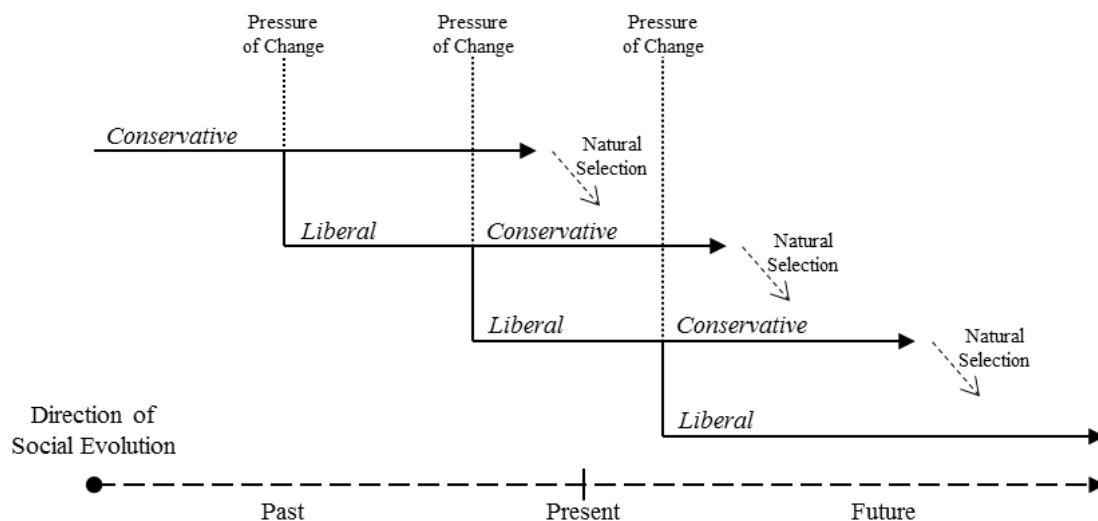


Source: Jung and Cho (2019)

During this process, the pressure forcing people to adjust to the new ideas takes a form of "pecuniary exigencies", and two extreme groups of people can ignore the pressure: the wealthy leisure class and the abjectly poor class (Veblen [1899] 2013). To put it another way, because the readjusting process is always an irksome toil, every individual is unwilling to change. However, due to economic pressure, people have to readjust themselves to the new progressive idea, except for the wealthy and the poor. The former has enough wealth to withstand the pressure, and the latter is too destitute to catch up with the change. In this study, I extended Veblen's view further by modifying the "pecuniary exigencies" to a subjective sense of dissatisfaction which can be measured by general happiness.

There are also numerous studies on individuals' political orientation. They have been mostly studied in political science, especially in the topic of voting behavior (Bendix and Lipset 1957; Brady 1943; Hunter 1953). Brady (1943) and Hunter (1943) showed that individuals' voting behavior is made based on their class rather than on the candidate's pledges. For example, regardless of the policy orientation that the candidate seeks, the elite group vote a conservative party. Bendix and Lipset (1957) found a variance in individuals' voting behavior depending on the country. More recently, the focus of studying voting behavior has shifted to class-betrayal voting behavior where the poor electorate supports conservative parties which usually pursue unfavorable policies for poor people (Kang 2003; Lee 2016). However, because these studies are heavily relying on the result of elections, they tend to overlook possibilities that the election results are reflecting a mere fragment of an individual's orientation and cannot show a more fundamental factor inside the decision process.

Jung and Cho (2019) pointed out the fallacy of this previous literature and tried to apply Veblen's (2013) theory to the context of South Korea where a severe conflict between conservative

and liberal was going on. They empirically showed a more conservativeness of both the poorest and the richest strata but, due to the limitation of using repeated cross-sectional data, they couldn't prove the evolutionary aspect of the change. Considering the shortcoming, in this study, I took a cohort-based pseudo-panel approach to possibly prove the evolutionary aspect.

## 2.2 Liberalization Trends in the United States

As the GSS dataset accumulated more and more useful information about the American people's attitudes and values, many scholars from various disciplines has conducted numerous meaningful studies. One of the streams of those studies is about liberalization trends in the United States. Smith (1985) found what he called "liberal plateau" where the liberalizing trends continued since World War II had reached its top and slowed its advance in 1980s. Davis (1992) tracked the trends of Americans' political view since 1972 to 1989 with two different mechanism of change: one was intracohort shift and the other was cohort replacement. He found that the replacement effect had showed the broadly liberal trend during the period but the intracohort shift showed some divergence depending on topics. Subsequently, he compared two generations who were interviewed in 1972-1976 and 2006-2008, respectively (Davis 2013). In that study he found that the latter generation was more liberal than the former generation, but the mechanism of change itself was evolving. He confirmed that the correlation between cohort and political views was getting decreased, and, in turn, the replacement effects had abated.

These studies about liberalization gave a good implication to my study in the sense that they confirmed the direction of change is generally in accord with liberal ideas. Most of all, the mechanism from Davis (1985) provided a good conceptual tool to think about the change. However, these studies assumed liberalism and conservatism as fixed concepts. For example,

regarding attitudes toward racial intermarriage, their studies considered people who supported the intermarriage as liberal and others conservative. In my study, however, I assumed that the social issues are not fixed in terms of political orientation. Instead, as new environment gradually forces individuals to change their thought, the conservative no longer oppose racial intermarriage at some point. Thus, in my study, I allowed the concepts to be fluid.

Considering the pluses and minuses of previous studies, this study hypothesized that individuals who feel more uncomfortable with their current life tend to jump on the environment change bandwagon more quickly, so show more liberal orientation.

## 3. Data and Methods

This study used the General Social Survey (GSS) data which is the largest social survey data in the United States conducted since 1972 and provides American's social characteristics and attitudes toward social issues. As one of the most widely used databases, GSS has helped many social scientists keep track of over-time trends in US society and enabled to compare the US with other societies (Marsden, Smith and Hout 2020).

Considering the availability of key variables, this study used the GSS dataset from 1974 to 2018, and the total number of respondents is 55,328 for 29 survey years[1] after removed the missing cases in political views (*POLVIEWS*). With the data, this study designed two separate stages of modeling methods to test the hypothesis. Through Stage 1, it tried to find the most active and debatable issues in our time in that the attitudes of individuals were clearly dividing towards the issues. The identified issues can be considered as good examples of events that represent the

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[1] Until 1993, GSS had been irregularly conducted in a year or two. Since 1994, it has been conducted biennially on a regular basis.

changing living environment and gradually force people to adapt to it. Plugging the identified issue into a mixed-effect cohort regression model as a response variable, in Stage 2, this study explored how individuals' life satisfaction measured by general happiness was associated with their attitudes towards the social issue. Finding the relationship is meaningful in that the identified predictors in the model can be regarded as key factors deciding individuals' time point for accepting the new environment or thought. The time gap among individuals, in turn, brings about the discordance in society. More details about each stage are as follows.

**3.1 *Stage 1*: Ridge Regression Model (Linear Regression with L2 Regularization)**

The primary purpose of this stage was to find the most active and debatable social issues in our time. In other words, it was to find the strongest predictors which have the most explanation power and strength on people's self-positioning of political orientation. It does make a sense that if one social issue is more strongly related to deciding one's political orientation—either conservative or liberal—than other issues, it implies that individuals are more clearly dividing on that issue; thus it is the most active issue at the moment, and going through the selective adaptation process in our society.

In order to collect candidates of the most active social issues, this study borrowed Davis (1992)'s 42 items using which he tracked the overall trends of the "liberal" shift in the United States since 1972 to 1989. He clustered the items into six categories such as crime, free speech, politics, race, religion, and gender (Davis 1992), but in this study, instead of clustering the items, all items were individually put into the model and L2 regularization was applied to address any possible multicollinearity and reduce variances of the least squares estimates. By doing so, this

study could avoid unnecessary bias resulted from constructing new variables and deal with every specific issue separately.

Out of the 42 items, this study removed 4 items which didn't represent social issues (*PARTYID*, *POLVIEWS*, *ATTEND*, and *XMOVIE*), replaced *ABHLTH* and *ABSINGLE* with a more general predictor (*ABANY*), and added one extra item, *GUNLAW*. Thus, in the model total 38 items were separately used, and their description is as in Table 1. (The complete results are listed in Table A1 in Appendix.)

Table 1: Candidates of Most Active Social Issues in Our Time

| Variable | Description | Variable | Description |
|---|---|---|---|
| cappun | Favor or oppose death penalty for murder | busing | Attitude toward racial busing |
| courts | Courts dealing with criminals | natrace | Improving the conditions of blacks |
| grass | Should marijuana be made legal | racmar | Favor law against racial intermarriage |
| natcrime | Halting rising crime rate | racopen | Vote on open housing law |
| natdrug | Dealing with drug addiction | racseg | Whites have right to seg. Neighborhood |
| libath | Allow anti-religious book in library | fund | How fundamentalist is r currently |
| libcom | Allow communists book in library | letdie1 | Allow incurable patients to die |
| libhomo | Allow homosexuals book in library | postlife | Belief in life after death |
| pornlaw | Feelings about pornography laws | reliten | Strength of affiliation |
| spkath | Allow anti-religionist to speak | suicide1 | Suicide if incurable disease |
| spkcom | Allow communists to speak | natheal | Improving & protecting nations health |
| spkhomo | Allow homosexual to speak | chldidel | Ideal number of children |
| spkrac | Allow racist to speak | fehome | Women take care of home not country |
| commun | Feelings about communism | fepres | Vote for woman president |
| natarms | Military, armaments, and defense | fework | Should women work |
| natcity | Solving problems of big cities | homosex | Homosexual sex relations |
| nateduc | Improving nations education system | premarsx | Sex before marriage |
| natenvir | Improving & protecting environment | abany* | Abortion if woman wants for any reason |
| natfare | Welfare | gunlaw* | Favor or oppose gun permits |

*Note:* The variables with asterisk were newly added, and the others are from Davis (1992).

To compare the strength of coefficients, every continuous variable was normalized to a 0-to-1 range, and the survey year was added as a control variable. Thus, the linear regression model and its least square estimates were as below:

$$Political\ Orientation_i = \beta_0 + \sum_{k=1}^{K} \beta_k Issue_{ik} + \sum_{n=1}^{N} \gamma_n Year_n + \epsilon_i$$

$$\hat{\beta}^{ridge} = arg\ \min_{\beta} RSS + \lambda \sum_{k=1}^{K} \sum_{n=1}^{N} |\beta_k|_2^2 + |\gamma_n|_2^2$$

where $i$ is each individual, $k$ is each social issue, and $n$ is the survey year. In the second equation, RSS is the residual sum of squares from the first equation and $\lambda$ is a hyperparameter adjusting the extent of penalty which was decided by the 10-fold cross-validation in this study. For missing values, this study used the multivariate imputation method and compared the results of five imputed datasets each other to secure the robustness of the imputation.

### 3.2 *Stage 2*: Mixed-effect Cohort Analysis Models

In Stage 2, this study tested the hypothesis in earnest. That is, it investigated how life satisfaction of individuals was associated with their attitude change towards a certain social issue found in Stage 1. As a key measure for life satisfaction, this study used the level of general happiness (*HAPPY*) in the GSS dataset and regressed the social issue on the measure with other confounding covariates.

To find a key factor of certain symptom over time, a panel analysis might be the most suitable method. However, because the GSS dataset is a repeated cross-sectional data, it was not possible to apply panel analysis here. As an alternative, this study transformed the GSS dataset to a pseudo-

panel by grouping each observation of individuals by their birth-year interval (cohort) and regarded

the cohort as an individual observation so that the same cohorts can be repeatedly observed in

different survey years. This approach was first devised by Deaton (1985) to make up for the lack

of panel data. The biggest benefit of the pseudo-panel analysis is that it can cover a long-time

period using the existing repeated cross-sectional data and that it is free from any attrition issue of

panel data (Guillerm 2017).

   After converting the dataset to a pseudo-panel data format, this study conducted multilevel

mixed-effect regression on the cohort observations. Multilevel regression has an advantage in that

it doesn't require a balanced panel design nor equally spaced measurement. Because in the cohort-

based converted dataset, each cohort didn't have the equal number of survey year, it was

considered as a suitable methodology for this study. Considering that each cohort was repeatedly

observed across tens of survey year, I designed a two-level hierarchical structure: the effect within

cohort at level 1 and between cohort at level 2. Thus, the model used in this stage is:

$$\overline{Issue}_{tc} = \beta_{0c} + b_1\overline{Satisfaction}_{tc} + \overline{X}\gamma_{controls} + \bar{\varepsilon}_{tc}$$

$$\beta_{0c} = b_0 + \bar{\zeta}_c$$

where $t$ is the survey year, $c$ is each cohort, $\bar{\zeta}_c \sim N(0, \sigma_\zeta^2)$, $\bar{\varepsilon}_{tc} \sim N(0, \sigma_\varepsilon^2)$, and the latter two terms

are independent each other. $\overline{X}$ is a feature matrix for all control variables including ratio-scaled

personal income and its squared term, subjective opinion of family income, age, and education

level. Notably, all variables including the controls are the average values of observed individuals

belonging to the same cohort at each survey year. Thus, for each variable $z$, $z_{tc}$ is transformed to $\bar{z}_{tc}$ where $\bar{z}_{tc} = \frac{1}{N}\sum_{i \in t,c} z_{itc}$.

One of the most careful parts of using a pseudo-panel format is to decide the size of cohorts. The larger the number of each cohort, the lower the measurement errors; however, using large cohorts means the smaller number of observations, and, in turn, it means the variability of observations at any given time decreases (Guillerm 2017). Due to the trade-off between the size of cohorts and the number of cohorts, this study used four different age brackets (3-year, 5-year, 10-year brackets, PEW Research Center's generational cohort[2]) to secure the robustness of the results. Their descriptive statistics were listed in Table A2 to A5 in Appendix.

## 4. Results

### 4.1 Results of Stage 1

The results of the linear regression with L2 regularization are as in Table 2 (only top 10 predictors are listed). Notably, the top 3 predictors and their strength order were identical in the models with the five different imputed datasets.

Table 2: Top 10 Social Issues Related to Individual's Self-Positioning of Political Orientation

| | Imputed Set 1 | | Imputed Set 2 | | Imputed Set 3 | | Imputed Set 4 | | Imputed Set 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| # | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ |
| 1 | homosex | 0.441 | homosex | 0.433 | homosex | 0.416 | homosex | 0.444 | homosex | 0.441 |
| 2 | cappun | 0.365 | cappun | 0.357 | cappun | 0.371 | cappun | 0.367 | cappun | 0.360 |
| 3 | natfare | 0.260 | natfare | 0.276 | natfare | 0.285 | natfare | 0.272 | natfare | 0.282 |
| 4 | natheal | 0.214 | premarsx | 0.215 | natheal | 0.221 | natheal | 0.210 | premarsx | 0.199 |
| 5 | natarms | 0.208 | natarms | 0.201 | premarsx | 0.207 | premarsx | 0.198 | natarms | 0.194 |

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[2] PEW Research Center (2017) defined generational cohorts in the U.S. such as Greatest Generation (born 1901-1927), Silent Generation (born 1928-1945), Baby Boom Generation (born 1946-1964), Generation X (born 1965-1980), Millennial Generation (born 1981 to 1996), and Generation Z (born 1997 and later).

| 6 | premarsx | 0.198 | natheal | 0.200 | natarms | 0.193 | natenvir | 0.193 | natenvir | 0.192 |
| 7 | natenvir | 0.165 | natenvir | 0.167 | grass | 0.159 | natarms | 0.188 | natheal | 0.184 |
| 8 | abany | 0.163 | abany | 0.158 | natenvir | 0.158 | natrace | 0.140 | abany | 0.154 |
| 9 | gunlaw | 0.155 | gunlaw | 0.152 | gunlaw | 0.155 | abany | 0.139 | gunlaw | 0.145 |
| 10 | commun | 0.149 | commun | 0.142 | abany | 0.145 | gunlaw | 0.137 | natrace | 0.140 |
| | (Intercept) | 1.762 | (Intercept) | 1.774 | (Intercept) | 1.733 | (Intercept) | 1.778 | (Intercept) | 1.826 |
| | MSE | 1.612 | | 1.612 | | 1.616 | | 1.612 | | 1.613 |

The signs of all key predictors were reasonable as expected. That is, a person has a more liberal orientation if she or he is favorable to homosexual and premarital sexual relations, abortion, euthanasia, smoking marijuana legally, government's spending for welfare, and gun permits. On the other hand, they tended to oppose the death penalty for murder, have a less strong affiliation with religion and prefer less children.

According to the result, this study identified that homosexual sex relations was the most active and debatable issue in our era, followed by death penalty for murder and larger government spending for welfare. To put it another way, those social issues are now going through the test of selective adaptation over which conservative and liberal sides have counterposed each other most seriously, and more and more conservatives are gradually accepting those issues and adapting themselves to the changing environments. Considering its importance as a predictor and the symbolic significance as a changing environment, this study selected homosexuality as an output variable in Stage 2 and investigated how it was associated with life satisfaction level.

**4.2 Results of Stage 2**

As shown in Figure 2, in the United States, a liberalization trend on the homosexual sex relations issue across generations was clearly detected. The y-axis refers to the attitude towards homosexual sex relations which was asked on a scale of 1 to 4 where 1 means "(the relationship

is) Always wrong" and 4 "Not wrong at all." Younger generations tended to have more favorable

attitudes toward homosexual sex relations. Most of all, the vertical differences among generations

which indicate that younger generations even have more favorable attitudes than older generations

when they enter the same ages. That is, as time goes by and generations pass, the homosexuality

issue is being gradually accepted by the natural selection process.

Figure 2: Change in Attitudes to Homosexual Sex Relations across Generation
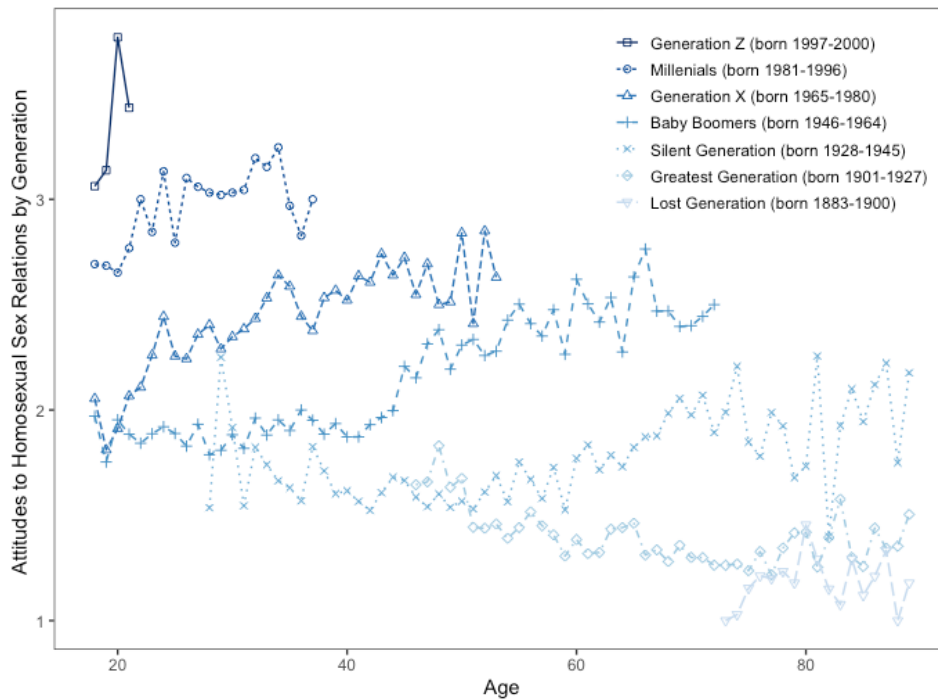


Table 4 summarized the results of the mixed-effect models with different birth-year

interval. Model (1) to (4) showed the results with 3-year, 5-year, 10-year, and PEW Research

Center's generational cohorts, respectively. As seen in the table, cohort's average level of life

satisfaction had a significant negative relationship with the attitudes to homosexual sex relations.

That is, when each cohort was more satisfied with their life on average, or had a higher level of

general happiness, it tended to become less favorable to the issue of homosexual sex relations. In

other words, a cohort which felt uncomfortable with their life in general, it became more favorable

to the liberal idea. This result supports the alternative hypothesis of this study.

Table 3: Results of Mixed-effect Cohort Analysis

| | Dependent variable: Homosexual Sex Relations | | | |
|---|---|---|---|---|
| | (1) 3-year Cohort | (2) 5-year Cohort | (3) 10-year Cohort | (4) PEW Cohort |
| *Fixed part* | | | | |
| Satisfaction | -0.659*** | -0.488*** | -0.827*** | -0.771* |
| | (0.120) | (0.183) | (0.268) | (0.416) |
| Personal income^2 | -0.043*** | -0.008 | 0.007 | -0.048* |
| | (0.015) | (0.016) | (0.018) | (0.028) |
| Personal income | 0.337*** | 0.098 | 0.028 | 0.368** |
| | (0.088) | (0.091) | (0.100) | (0.171) |
| Subjective family income level | 0.091 | 0.005 | -0.045 | -0.329 |
| | (0.089) | (0.122) | (0.189) | (0.257) |
| Age | 0.012*** | 0.012*** | 0.012*** | 0.013*** |
| | (0.001) | (0.001) | (0.002) | (0.003) |
| Education level | 0.086*** | 0.066** | 0.072* | 0.134*** |
| | (0.020) | (0.026) | (0.038) | (0.044) |
| Constant | 1.048** | 1.512*** | 2.354*** | 1.747 |
| | (0.426) | (0.558) | (0.833) | (1.203) |
| *Random part* | | | | |
| $\sigma_\epsilon^2$ | 0.061 | 0.050 | 0.053 | 0.046 |
| $\sigma_\zeta^2$ | 0.593 | 0.633 | 0.708 | 0.674 |
| Number of Cohorts | 31 | 19 | 10 | 7 |
| Number of Observations | 568 | 355 | 196 | 118 |
| Log Likelihood | -106.808 | -37.882 | -29.538 | -14.330 |
| Akaike Inf. Crit. | 231.617 | 93.763 | 77.077 | 46.660 |
| Bayesian Inf. Crit. | 270.696 | 128.612 | 106.580 | 71.596 |

*Note:*                                                              $^*$p$^{**}$p$^{***}$p<0.01

One notable point is that personal income level significantly showed a positive relationship with the dependent variable, while its squared term showed negative in Model (1) and (4). It means that when a cohort had a higher income on average, they were more favorable to the social issue; however, the extent decreased as the level of income increased. This result does well match Veblen's thoughts. As mentioned above, Veblen gave attention to the wealthy and the poor classes. According to Veblen, both extremes stand against the change pressure longer than other classes because the former has enough wealth to withstand the pressure, and the latter is too destitute to pay the minimum cost required to catch up with the change (Veblen [1899] 2013). It could provide a supplementary explanation for the literature on why extreme income brackets often have more conservative orientation than others in many societies.

Regarding age and education level, in all cohort models, they showed consistent positive effects. As the average age of a cohort increases, it tends to be more favorable to the homosexual sex relations. This trend is also shown in Figure 2 except for the Lost and Greatest generations. Also, as the average education level of a cohort is higher, it showed more amicable attitudes to the issue. Lastly, the variances of the random intercept ($\sigma_\zeta^2$) in all models were much larger than the variances of within-cohort error terms ($\sigma_\epsilon^2$) (Intraclass correlation (ICC) was even larger than 0.5). It means that the differences between cohorts in terms of their intercepts are a more important factor to explain the whole data than the within-cohort difference across time. It can be also interpreted with Davis (1992)'s change mechanism. Namely, the cohort replacement effect was stronger than intracohort effect on individual's attitudes to the issue.

## 5. Conclusion

Our thoughts have gradually changed according to a living environment. During the process of thought change, there always occurs discordance among people due to their different timing of accepting the new thoughts. This study tried to find the cause of the timing gap as hypothesizing that individuals who are less satisfied with their life adapt themselves more quickly to the new environment. To test the hypothesis, this study, first, tried to confirm an event which could be considered as an on-going examples of changing living environment in our era. As a result, it found that the issue of homosexual sex relations was the most active and debatable issue nowadays which had the most accurate explanation power on individual's political orientation.

Sticking to the issue of homosexual sex relations, in next stage, this study conducted the hypothesis test, that is how individual's life satisfaction can affect individual's attitudes towards the event. Finally, this study showed that the level of life satisfaction is a key factor deciding individuals' timing to be liberal. Cohorts that were more satisfied with their life tended to have more conservative orientation. To put it another way, one's dissatisfaction with current status makes their attitude change towards a new environment and it, in turn, becomes dynamics of social progress. This result accords with Veblen's (2013) idea in that the pressure of change is related to economic hardship; however, it also extended his idea to a subjective sense of happiness as well as the objective level of income.

This study is meaningful in that it tried to find the logic behind the self-positioning political orientation. Unlike the relevant previous literature which had mainly focused on the revealed propensity of individuals and fixed the definition of liberalism and conservatism, this study regarded them as fluid and comparative concepts over time and tried to find the dynamics behind the change. This attempt would add a possible explanation to the literature.

Despite all the efforts, this study has some limitations. First of all, although using the mixed-effect cohort analysis with the pseudo-panelized data format, the causal relationship between the level of life satisfaction and the change in one's attitudes is still not clear. For future study, adding some instrumental variables or lagged dependent variable might be a good attempt. Second, during the process of coverting the individual-level data to a cohort-based pseudo-panel form, it had to lose some important binary information such as respondents' sex because it was impossible to average them.

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## Appendix

Table A1: Complete Result of Stage 1

| | Imputed Set 1 | | Imputed Set 2 | | Imputed Set 3 | | Imputed Set 4 | | Imputed Set 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| # | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ | Predictor | $\hat{\beta}$ |
| 1 | homosex | 0.441 | homosex | 0.433 | homosex | 0.416 | homosex | 0.444 | homosex | 0.441 |
| 2 | cappun | 0.365 | cappun | 0.357 | cappun | 0.371 | cappun | 0.367 | cappun | 0.360 |
| 3 | natfare | 0.260 | natfare | 0.276 | natfare | 0.285 | natfare | 0.272 | natfare | 0.282 |
| 4 | natheal | 0.214 | premarsx | 0.215 | natheal | 0.221 | natheal | 0.210 | premarsx | 0.199 |
| 5 | natarms | 0.208 | natarms | 0.201 | premarsx | 0.207 | premarsx | 0.198 | natarms | 0.194 |
| 6 | premarsx | 0.198 | natheal | 0.200 | natarms | 0.193 | natenvir | 0.193 | natenvir | 0.192 |
| 7 | natenvir | 0.165 | natenvir | 0.167 | grass | 0.159 | natarms | 0.188 | natheal | 0.184 |
| 8 | abany | 0.163 | abany | 0.158 | natenvir | 0.158 | natrace | 0.140 | abany | 0.154 |
| 9 | gunlaw | 0.155 | gunlaw | 0.152 | gunlaw | 0.155 | abany | 0.139 | gunlaw | 0.145 |
| 10 | commun | 0.149 | commun | 0.142 | abany | 0.145 | gunlaw | 0.137 | natrace | 0.140 |
| 11 | nateduc | 0.146 | grass | 0.142 | commun | 0.143 | grass | 0.137 | grass | 0.139 |
| 12 | grass | 0.140 | natrace | 0.138 | natrace | 0.128 | commun | 0.126 | commun | 0.127 |
| 13 | natcity | 0.113 | nateduc | 0.126 | nateduc | 0.108 | nateduc | 0.124 | nateduc | 0.112 |
| 14 | natrace | 0.109 | chldidel | -0.101 | natcity | 0.097 | natcity | 0.102 | postlife | -0.094 |
| 15 | courts | 0.094 | reliten | -0.089 | courts | 0.095 | reliten | -0.091 | natcity | 0.094 |
| 16 | reliten | -0.091 | natcity | 0.088 | reliten | -0.090 | courts | 0.089 | courts | 0.093 |
| 17 | chldidel | -0.085 | courts | 0.087 | chldidel | -0.089 | postlife | -0.087 | chldidel | -0.088 |
| 18 | racopen | 0.076 | postlife | -0.078 | busing | 0.087 | letdie1 | 0.081 | reliten | -0.087 |
| 19 | busing | 0.074 | letdie1 | 0.074 | racopen | 0.082 | chldidel | -0.081 | busing | 0.080 |
| 20 | letdie1 | 0.074 | fepres | 0.073 | postlife | -0.079 | racopen | 0.080 | natdrug | 0.077 |
| 21 | postlife | -0.071 | busing | 0.072 | letdie1 | 0.076 | busing | 0.079 | letdie1 | 0.064 |
| 22 | pornlaw | 0.066 | natdrug | 0.067 | fepres | 0.064 | natdrug | 0.070 | pornlaw | 0.062 |
| 23 | fepres | 0.053 | racopen | 0.067 | pornlaw | 0.061 | pornlaw | 0.065 | racopen | 0.060 |
| 24 | natdrug | 0.050 | pornlaw | 0.064 | suicide1 | 0.054 | fepres | 0.062 | fepres | 0.057 |
| 25 | suicide1 | 0.050 | spkath | -0.060 | racmar | -0.049 | spkath | -0.041 | suicide1 | 0.057 |
| 26 | spkath | -0.049 | natcrime | 0.049 | spkath | -0.040 | fund | 0.039 | spkath | -0.057 |
| 27 | spkhomo | -0.035 | suicide1 | 0.037 | fund | 0.040 | suicide1 | 0.037 | fund | 0.036 |
| 28 | fund | 0.032 | fund | 0.037 | fehome | 0.036 | spkhomo | -0.035 | fehome | 0.033 |
| 29 | natcrime | 0.020 | fework | 0.023 | natdrug | 0.035 | year | -0.016 | racmar | -0.033 |
| 30 | year | -0.015 | spkrac | -0.021 | libath | 0.027 | libcom | -0.015 | spkhomo | -0.022 |
| 31 | libath | -0.013 | year | -0.015 | spkhomo | -0.027 | racmar | -0.015 | natcrime | 0.019 |
| 32 | racmar | -0.010 | libcom | -0.015 | libhomo | -0.026 | fehome | 0.015 | year | -0.015 |
| 33 | fework | 0.010 | spkhomo | -0.013 | year | -0.015 | natcrime | 0.011 | libhomo | -0.009 |

| 34 | libcom | 0.010 | libath | 0.013 | spkcom | -0.011 | fework | 0.010 | fework | 0.008 |
| 35 | libhomo | -0.006 | libhomo | -0.009 | fework | 0.009 | libath | 0.005 | libcom | 0.007 |
| 36 | spkrac | -0.003 | racmar | -0.009 | spkrac | -0.006 | spkrac | 0.004 | spkcom | -0.005 |
| 37 | spkcom | 0.002 | spkcom | 0.004 | natcrime | 0.006 | spkcom | -0.004 | libath | 0.001 |
| 38 | fehome | 0.001 | fehome | 0.001 | libcom | 0.006 | libhomo | 0.002 | spkrac | 0.001 |
|  | (Intercept) | 1.762 | (Intercept) | 1.774 | (Intercept) | 1.733 | (Intercept) | 1.778 | (Intercept) | 1.826 |
|  | MSE | 1.612 |  | 1.612 |  | 1.616 |  | 1.612 |  | 1.613 |

Table A2: Descriptive Statistics of Pseudo-Panel Data with 3-year Cohort

| # | Cohorts | N_year | Homosex | Satisfaction | Income | Sub_income | Age | Education |
|---|---------|--------|---------|--------------|--------|------------|-----|-----------|
| 1 | 1888-1911 | 23 | 1.24 | 2.22 | 3.43 | 2.76 | 79.16 | 9.99 |
| 2 | 1912-1914 | 24 | 1.27 | 2.23 | 3.30 | 2.74 | 72.47 | 10.65 |
| 3 | 1915-1917 | 26 | 1.34 | 2.22 | 3.52 | 2.81 | 70.98 | 11.05 |
| 4 | 1918-1920 | 27 | 1.42 | 2.23 | 3.10 | 2.83 | 68.80 | 11.38 |
| 5 | 1921-1923 | 29 | 1.41 | 2.18 | 3.20 | 2.88 | 67.39 | 11.52 |
| 6 | 1924-1926 | 30 | 1.52 | 2.22 | 3.36 | 2.87 | 65.20 | 11.77 |
| 7 | 1927-1929 | 32 | 1.60 | 2.21 | 3.33 | 2.91 | 63.90 | 12.04 |
| 8 | 1930-1932 | 32 | 1.59 | 2.21 | 3.39 | 2.94 | 60.92 | 12.36 |
| 9 | 1933-1935 | 32 | 1.62 | 2.21 | 3.41 | 2.90 | 57.86 | 12.44 |
| 10 | 1936-1938 | 32 | 1.70 | 2.21 | 3.41 | 2.88 | 54.90 | 12.64 |
| 11 | 1939-1941 | 32 | 1.76 | 2.23 | 3.51 | 2.95 | 51.88 | 12.93 |
| 12 | 1942-1944 | 32 | 1.94 | 2.20 | 3.53 | 2.97 | 48.87 | 13.21 |
| 13 | 1945-1947 | 32 | 2.05 | 2.18 | 3.61 | 2.96 | 45.79 | 13.52 |
| 14 | 1948-1950 | 32 | 2.07 | 2.18 | 3.52 | 2.93 | 42.91 | 13.61 |
| 15 | 1951-1953 | 32 | 2.13 | 2.16 | 3.49 | 2.88 | 39.91 | 13.44 |
| 16 | 1954-1956 | 32 | 2.01 | 2.15 | 3.39 | 2.86 | 36.95 | 13.14 |
| 17 | 1957-1959 | 29 | 2.08 | 2.17 | 3.32 | 2.88 | 35.95 | 13.19 |
| 18 | 1960-1962 | 26 | 2.09 | 2.17 | 3.27 | 2.84 | 35.01 | 13.32 |
| 19 | 1963-1965 | 24 | 2.05 | 2.16 | 3.15 | 2.85 | 33.39 | 13.26 |
| 20 | 1966-1968 | 22 | 2.08 | 2.19 | 3.10 | 2.86 | 31.77 | 13.19 |
| 21 | 1969-1971 | 19 | 2.26 | 2.19 | 3.06 | 2.86 | 30.99 | 13.31 |
| 22 | 1972-1974 | 16 | 2.33 | 2.17 | 3.05 | 2.78 | 30.37 | 13.26 |
| 23 | 1975-1977 | 14 | 2.65 | 2.17 | 3.06 | 2.82 | 29.18 | 13.24 |
| 24 | 1978-1980 | 12 | 2.73 | 2.11 | 3.06 | 2.78 | 28.09 | 13.17 |
| 25 | 1981-1983 | 10 | 2.69 | 2.13 | 3.01 | 2.78 | 27.14 | 13.34 |
| 26 | 1984-1986 | 9 | 2.65 | 2.25 | 2.76 | 2.82 | 25.18 | 13.30 |
| 27 | 1987-1989 | 7 | 2.96 | 2.10 | 2.52 | 2.76 | 24.07 | 13.11 |

| 28 | 1990-1992 | 6 | 2.79 | 2.15 | 2.16 | 2.78 | 22.27 | 12.87 |
| 29 | 1993-1995 | 4 | 3.12 | 2.09 | 2.00 | 2.85 | 21.22 | 12.66 |
| 30 | 1996-1998 | 3 | 3.22 | 2.10 | 1.88 | 2.89 | 19.53 | 12.51 |
| 31 | 1999-2000 | 1 | 3.44 | 2.04 | 1.62 | 2.85 | 18.54 | 11.50 |

Table A3: Descriptive Statistics of Pseudo-Panel Data with 5-year Cohort

| # | Cohorts | N_year | Homosex | Satisfaction | Income | Sub_income | Age | Education |
|---|---------|--------|---------|--------------|--------|------------|-----|-----------|
| 1 | 1888-1911 | 23 | 1.24 | 2.22 | 3.43 | 2.76 | 79.16 | 9.99 |
| 2 | 1912-1916 | 25 | 1.30 | 2.21 | 3.38 | 2.77 | 72.09 | 10.84 |
| 3 | 1917-1921 | 28 | 1.41 | 2.21 | 3.06 | 2.84 | 69.46 | 11.38 |
| 4 | 1922-1926 | 30 | 1.48 | 2.22 | 3.30 | 2.87 | 66.13 | 11.68 |
| 5 | 1927-1931 | 32 | 1.61 | 2.21 | 3.34 | 2.92 | 62.92 | 12.16 |
| 6 | 1932-1936 | 32 | 1.64 | 2.20 | 3.41 | 2.90 | 57.81 | 12.44 |
| 7 | 1937-1941 | 32 | 1.74 | 2.23 | 3.50 | 2.93 | 52.82 | 12.86 |
| 8 | 1942-1946 | 32 | 1.97 | 2.19 | 3.57 | 2.96 | 47.86 | 13.28 |
| 9 | 1947-1951 | 32 | 2.08 | 2.18 | 3.56 | 2.93 | 42.91 | 13.61 |
| 10 | 1952-1956 | 32 | 2.07 | 2.15 | 3.43 | 2.87 | 37.98 | 13.28 |
| 11 | 1957-1961 | 29 | 2.08 | 2.17 | 3.28 | 2.87 | 35.11 | 13.17 |
| 12 | 1962-1966 | 25 | 2.12 | 2.16 | 3.13 | 2.84 | 32.88 | 13.23 |
| 13 | 1967-1971 | 21 | 2.17 | 2.16 | 3.05 | 2.84 | 30.72 | 13.16 |
| 14 | 1972-1976 | 16 | 2.34 | 2.17 | 3.00 | 2.77 | 29.61 | 13.23 |
| 15 | 1977-1981 | 12 | 2.70 | 2.13 | 3.06 | 2.78 | 28.24 | 13.23 |
| 16 | 1982-1986 | 10 | 2.77 | 2.14 | 2.85 | 2.82 | 25.41 | 13.21 |
| 17 | 1987:1991 | 7 | 2.96 | 2.12 | 2.42 | 2.78 | 23.39 | 13.02 |
| 18 | 1992-1996 | 5 | 3.32 | 2.07 | 2.02 | 2.73 | 20.74 | 12.45 |
| 19 | 1997-2000 | 2 | 2.86 | 1.97 | 1.74 | 3.00 | 19.17 | 12.22 |

Table A4: Descriptive Statistics of Pseudo-Panel Data with 10-year Cohort

| # | Cohorts | N_year | Homosex | Satisfaction | Income | Sub_income | Age | Education |
|---|---------|--------|---------|--------------|--------|------------|-----|-----------|
| 1 | 1888-1911 | 23 | 1.24 | 2.22 | 3.43 | 2.76 | 79.16 | 9.99 |
| 2 | 1912-1921 | 28 | 1.38 | 2.21 | 3.05 | 2.82 | 71.37 | 11.19 |
| 3 | 1922-1931 | 32 | 1.56 | 2.21 | 3.31 | 2.89 | 65.16 | 11.95 |
| 4 | 1932-1941 | 32 | 1.70 | 2.22 | 3.46 | 2.91 | 55.13 | 12.66 |
| 5 | 1942-1951 | 32 | 2.03 | 2.18 | 3.57 | 2.95 | 45.07 | 13.47 |
| 6 | 1952-1961 | 32 | 2.07 | 2.15 | 3.37 | 2.87 | 35.89 | 13.21 |
| 7 | 1962-1971 | 25 | 2.15 | 2.16 | 3.05 | 2.83 | 31.15 | 13.15 |

| #  | Cohorts   | N_year | Homosex | Satisfaction | Income | Sub_income | Age   | Education |
|----|-----------|--------|---------|--------------|--------|------------|-------|-----------|
| 8  | 1972-1981 | 16     | 2.40    | 2.16         | 2.91   | 2.75       | 27.91 | 13.08     |
| 9  | 1982-1991 | 10     | 2.78    | 2.14         | 2.70   | 2.81       | 24.04 | 13.04     |
| 10 | 1992-2000 | 5      | 3.31    | 2.06         | 1.94   | 2.74       | 20.32 | 12.34     |

Table A5: Descriptive Statistics of Pseudo-Panel Data with PEW's Generational Cohort

| #  | Cohorts             | N_year | Homosex | Satisfaction | Income | Sub_income | Age   | Education |
|----|---------------------|--------|---------|--------------|--------|------------|-------|-----------|
| 1  | Baby Boomers        | 32     | 2.07    | 2.17         | 3.43   | 2.89       | 37.67 | 13.38     |
| 2  | Generation X        | 23     | 2.19    | 2.15         | 2.90   | 2.81       | 28.29 | 13.01     |
| 3  | Generation Z        | 2      | 2.86    | 1.97         | 1.74   | 3.00       | 19.17 | 12.22     |
| 4  | Greatest Generation | 31     | 1.43    | 2.21         | 3.22   | 2.81       | 72.32 | 11.29     |
| 5  | Lost Generation     | 16     | 1.17    | 2.21         | 3.82   | 2.77       | 83.65 | 9.20      |
| 6  | Millennials         | 10     | 2.77    | 2.12         | 2.68   | 2.79       | 23.96 | 13.01     |
| 7  | Silent Generation   | 32     | 1.76    | 2.21         | 3.49   | 2.93       | 54.51 | 12.73     |