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Preferred Levels of Income Inequality in a Period of Systemic Change: Analysis of Data from the Polish Panel Survey, POLPAN 1988–2003

Abstract: Rising trends in economic inequality are well-established across many affluent nations. However, researchers have accrued considerably less knowledge regarding the economic attitudes and preferences of individuals living within the context of increasing inequality, especially in developing or transition countries. To gain leverage on this topic, we utilize data from Polish Panel Survey (POLPAN) from 1988–2003 to examine change over time in respondents' preferred levels of income inequality. Results show that Poles tend to accept higher levels of income inequality over time. This effect increases with time, even after controlling for respondents' meritocratic beliefs and attitudes toward state intervention. In addition, this rise in preferred income inequality changes in accordance with actual and perceived changes in the earnings distribution. After describing the patters of variation in acceptance of income inequality between different social groups, we discuss the implications of individuals' evolving benchmarks for preferred levels of inequality.

Keywords: stratification, inequality, economic attitudes, panel analysis, transition, Poland

Introduction

Researchers have documented a substantial rise in income inequality across a number of diverse nations during the past half century (Gornick and Jantti 2013; Piketty 2014). Within the past decade, social scientists have produced a significant amount of research documenting the causal mechanisms (Piketty and Saez 2003) and social outcomes (Esping-Andersen 2007) involved in this escalation of economic inequality. Much less is known however about attitudes toward income inequality. While broader research on inequality preferences, redistributive justice, and meritocratic beliefs has a long history (Jasso and Rossi 1977; Rawls 1971), a number of methodological problems have prevented a more comprehensive understanding of attitudes toward inequality in particular. First, operationalizations of attitudes and policy preferences are weakly developed (McCall and Kenworthy 2009). Oftentimes, the kinds of questions available in nationally representative surveys are not sufficient to fully understand the complexity of redistributive attitudes and notions of ideal levels of inequality (McCall 2013). Second, researchers have seldom been able to use panel data to accurately assess the causal ordering of structural change and individuals' preferences. Finally, there has not been much research on the effects of contextual change, such as the

economic and political transitions in Eastern Europe and Asia of 1989/1990, on individual attitudes (McCall 2013).

In the current study, we seek to address these gaps and methodological challenges. Using the Polish Panel Study (POLPAN), we follow a set or respondents over a period of fifteen years, 1988–2003, during Poland's transition from central planning toward market economy, and track their changes in preferred levels of earnings inequality in society, measured as the ratio of just earnings of the owner of a factory to the just earnings of an unskilled worker.[1] Our goal is to determine how exactly the marked rise in economic inequality in Poland is affecting individuals' attitudes about societal disparities and what is considered just.

Literature Review

Attitudes toward Inequality and Social Psychology

Dramatic rises in income inequality have created much scholarly interest in how populations are adjusting to increasingly unequal settings. For example, in the U.S. the ratio of CEO pay to that of a common laborer increased from 30 : 1 in the early 1970's to 100 : 1 in the 2000's (McCall 2013). Recent evidence from Piketty (2014) suggests that this pattern of economic divergence is likely to continue in the coming decades. How then do individuals respond to these substantial changes in the earnings distribution? How do attitudes toward inequality change as inequality itself changes?

Perhaps the most perplexing finding about individuals' preferences about inequality is that studies notoriously refute one of the most straight-forward explanations. Tests of the median voter-hypothesis, or the idea that increasing market inequality will produce greater demand for redistributive generosity, have at best revealed mixed evidence (Brzezinski, Jancewicz, and Letki 2013; Kenworthy and McCall 2008). In fact, researchers seeking to explain how individuals are adapting to high levels of inequality have come up empty-handed after analyzing levels of well-being, happiness, support for progressive taxes, etc. (McCall 2013). Indeed, McCall and Kenworthy (2009) and McCall (2013) demonstrate the complexity involved in understanding beliefs and preferences concerning inequality, opportunity, and redistribution. The best evidence in the U.S. context suggests that individuals do care about rising income inequality to the extent that inequality can itself be a restriction to opportunity (McCall 2013). Similarly, using data from the International Social Justice Project in Germany, Schneider (2012) emphasizes that what really matters to individuals is not the actual or perceived level of inequality, but rather the 'attributed legitimacy' of income inequality, especially as it is connected back to one's own well-being.

This more nuanced conception of attitudes and changing preferences toward inequality lends itself to a growing literature in the realm of social psychology. Experimental studies

[1] We are using the term 'preferred inequality' with regard to the differences between respondents' answers to questions about earnings in specific occupations that would be 'just and fair,' or that would lead to achieving 'some justice.' In POLPAN the wording of these questions remained unchanged throughout the study. In this paper, for stylistic reasons, the terms preferred inequality, just inequality, or fair inequality will be used interchangeably.

indicate that knowledge of greater actual inequality causes respondents to report higher estimates of what they deem as 'acceptable' levels of inequality (Trump 2013). According to the 'justification principle', "Even individuals who do not benefit from inequality are more likely to acquiesce in and even prefer unequal distributions, if they perceive that the differential rewards are earned" (Trump 2013: 7). There is some evidence of this relationship specifically within the Polish context. Domański and Sawiński (2012) show that preferred levels of inequality are conditioned by levels of actual inequality. However, the question remains as to whether 'actual' inequality is accurately perceived by individuals responding to large-scale surveys or whether structural change is properly accounted for in studies relying on cross-sectional design, keeping in mind that the actual structure of the earnings distribution may be influencing these attitudes in both overt and subtle ways.

Cross-National Evidence

Scholars have also continued to add to our knowledge of inequality attitudes from a comparative and cross-national perspective. The most consistent findings point to the following pattern: 1) across nations there is general agreement on the legitimate pay of low-status occupations, 2) there is agreement that high-status occupations merit higher pay than the minimum, but 3) there is substantial cross-national variation and disagreement over how much more higher-earners should be paid (Hadler 2005; Kelley and Evans 1993). There is also general consensus that higher ratios of inequality are viewed more favorably by men (Kluegel and Smith 1986), individuals with more education and those with higher incomes (Kelley and Evans 1993).[2] More recently, Tóth and Keller (2013) analyzed beliefs about inequality by creating a 'redistributive preference index' from attitudinal measures concerning state involvement in providing jobs, the extent of social expenditures, and the degree to which wealth is distributed in society. After analysis of 17 affluent European countries the authors conclude that support for redistribution varies considerably across nations and that this support corresponds most notably with the extent and depth of relative poverty.

Using ISSP data for 30 nations, Hadler (2005) observes that attitudes toward inequality are less critical in societies in settings where societal inequality is more likely to be interpreted as the result of 'just rewards' for one's effort, rather than an unequal opportunity structure. Results also indicate that the macro-level variable of 'communist history' contributes to a more critical view of income inequality. In general, this broad categorization of nations transitioning from planned to market economies has proven especially useful in studies of rising inequality and changing economic preferences (Redmond, Schnepf, and Suhrcke 2002). That said, research has also documented substantial variation in attitudes and preferences within post-socialist transition economies (Bandelj and Mahutga 2010; Hadler 2005). Through a detailed analysis of inequality attitudes in Poland we intend to add to this ongoing discussion with a country-specific approach, but to also frame the results and implications within a broader comparative context.

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[2] Although these demographic patterns are not the main focus of our study, we will nevertheless note the direction and magnitude of these predictors to provide additional evidence.

The Polish Context

The timeframe analyzed in the current study includes the 15 years between 1988 and 2003, a time of rapid systemic change in Poland (for a full description of initial conditions, strategy and implementation of new economic procedures, and outcomes, see Balcerowicz 1994). Inflation peaked in 1990 with the Consumer Price Index close to 700[3] while the registered unemployment rate grew rapidly, reaching 16.5% in 1994,[4] compared to full-employment in the centrally planned economy pre-1989. By 1998 when the third wave of POLPAN was fielded, Poland was on a relatively stable track of economic growth and nearing North Atlantic (NATO) integration. In 1997 Poland adopted a new Constitution, which confirmed and cemented the principles of market economy and political pluralism. After four years of annual economic growth of around 5–7% accompanied by declining inflation, unemployment dropped to below 10%, unseen since 1991, and GDP per capita exceeded the 1988 level by 50%.[5] The Polish economy continued to grow, although at a slower pace, throughout the recession in the early 2000s, having received a boost from the European Union's pre-accession support exceeding EUR 7 billion in 1990–2003.[6] Given this tumultuous era, ongoing studies of the changing Polish economy and related social implications have proven valuable.

In both studies of redistributive preferences (Tóth and Keller 2013) and rising economic inequality (Bandelj and Mahutga 2010), Poland often appears in the 'middle of the pack'. Among post-socialist countries, economic inequality in Poland has grown considerably faster than in some countries (Czech Republic and Slovenia), yet others (Romania and Lithuania) have experienced much more dramatic increases in inequality than Poland. In terms of overall economic inequality, the Gini Index increased from just above 25 in 1987 to nearly 36 in 2004 (Brzeziński, Jancewicz, and Letki 2013). Below, Figure 1 traces the percentage of income held by the top 10% and bottom 10% of earners. World Bank Indicators for Poland[7] reveal a steady upward trend for the highest earners while the wages for the lower decile remain stagnant.[8]

Data from the Polish General Social Survey indicate that Poles are not only aware of increasing income inequalities, but they also feel that the current level of inequality is too high: the percentage of respondents who believe that income inequalities in Poland are too large has increased from 80% in the early 1990's to 91% in 2010 (Brzeziński, Jancewicz, and Letki 2013). These descriptive trends precipitate a number of questions regarding the

[3] Annual Consumer Price Index. Central Statistical Office of the Republic of Poland. Retrieved December 31, 2013 (http://www.stat.gov.pl/gus/5840_1634_PLK_HTML.htm).

[4] Registered unemployment in Poland. Central Statistical Office of the Republic of Poland. Retrieved December 31, 2013 (http://www.stat.gov.pl/gus/5840_677_PLK_HTML.htm).

[5] GDP based on PPP per capita GDP Current international dollars. Retrieved December 31, 2013 (http://www.econstats.com/weo/CPOL.htm).

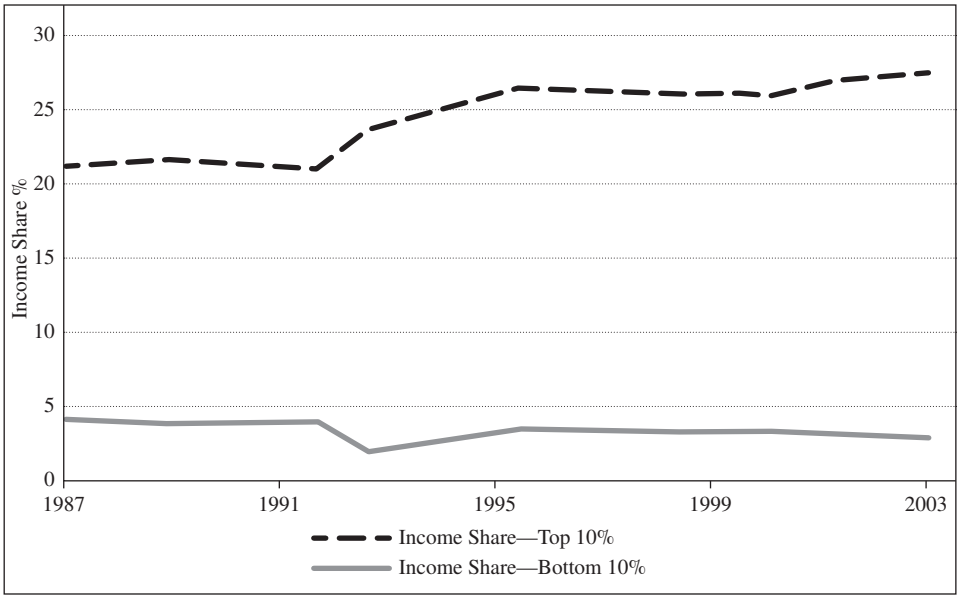
[6] UKIE. 2003. Mapa pomocy Unii Europejskiej udzielonej Polsce w ramach programu Phare 1990–2003, ISPA 2000–2003 oraz SAPARD. Urząd Komitetu Integracji Europejskiej. Retrieved December 31, 2013 (http://archiwumukie.polskawue.gov.pl/HLP/files.nsf/0/73C64711C4628031C1256EDA0034E6E4/$file/publikacja_mapa_pomocy_UE.pdf).

[7] World Development Indicators: Income share held by highest 10% (SI.DST.10TH.10), and Income share held by lowest 10% (SI.DST.FRST.10). Retrieved December 31, 2013 (http://data.worldbank.org/country/poland).

[8] For an economic analysis of wage inequality in Poland see Newell and Socha 2007.

Figure 1

Rising Inequality in Poland 1987–2004



Source: World Bank.

current literature. On one hand, it appears that Polish citizens are *en route* to confirming the median-voter hypothesis—inequality is on the rise and dissatisfaction with this trend seems to be growing (Kenworthy and McCall 2008). On the other hand, it is possible that rising inequality may be disliked yet simultaneously tolerated as long as economic opportunities are perceived to be accessible (McCall 2013). It is also possible that attitudes toward inequality may be in the process of shifting in accordance with actual changes in the earnings distribution (Trump 2013)—perhaps the rise in dissatisfaction with the current levels of inequality will gradually be tempered with time as individuals become accustomed to higher and higher levels of inequality.

Hypotheses

Change in Levels of Perceived and Preferred Inequality

How did fair inequality between earnings in lowest-and highest-paying occupations change in course of the transition from centrally-planned to market economy? Social psychology has developed many ways of explaining changes in what people perceive as fair, but there seems to be consensus that with changes in real inequality, opinions about fair inequality follow in the same direction (Trump 2013). Equity and status attribution theory explain why the built-in preference of cognitive consistency leads individuals to accept what they observe as normal and appropriate (Della Fave 1980). Similarly, system justification theory

and *status quo* bias focus on the motivational and cognitive aspect of the tendency to prefer the known to the unknown (Zajonc 1968), and to believe that the "environment is a just and orderly place where people usually get what they deserve" (Lerner and Miller 1978: 1030). In this way ideas about "what ought to be" follow "what is believed to be", which in turn are an imperfect reflection of "what objectively exists" (Krauze and Słomczyński 1986).

In the Polish context, the transition from socialist economy with its egalitarian principles and central planning to market economy essentially brought an increase in income inequality from early on in the transition. As shown in Figure 1, actual inequality in Poland has been increasing throughout the 15-year period covered by our study. Using survey data from different studies carried out in Poland in 1988 and 2010, Domański (2013) found that preferred inequality is lower than perceived inequality, yet both have increased over time. We expect similar findings in our analysis. One reason that reports of perceived inequality have risen faster could be that the changes in actual inequality were paralleled by the rapid development of free media (private-owned press, radio, and TV) which intensified coverage of both extreme poverty and excessive wealth. This is why we additionally expect the gap between preferred and perceived inequality to grow with time.

Hypothesis 1.1: Perceived and preferred income inequality have increased over time.

Hypothesis 1.2: Additionally, the level of perceived inequality has been growing faster than that of preferred inequality.

Meritocracy and Welfare State Support

Having established general trends in aggregate levels of fair earnings inequality, we turn to individual-level factors that explain the variation in tolerance towards inequality between individuals: meritocratic attitudes and preferences for the welfare state. Meritocracy is a system where individual merit, originally intelligence and effort (Young 1958), now understood more broadly including e.g. education, experience and abilities, is the basis for the distribution of rewards such as income, power and prestige, and thus provides legitimation of social inequality. Research carried out in many Western countries shows that the idea that income should depend on individual merit receives widespread support (Kluegel and Smith 1986), and occupations that require higher levels of skills are placed higher in the hierarchy of fair incomes (Kelley and Evans 1993). In Poland and the rest of the "Eastern Block", the shift from socialist to market economy meant a change in mechanisms of distribution of surplus, from ideologically-driven preference of industry and production and no clear link between pay and qualifications (Wesołowski and Mach 1986: 177), to a world where earnings are to a large extent determined by productivity, and hence much more closely related to individual merit (Locklear 1998).[9] In such a system, where income comes to be viewed as an earned reward, individuals who hold meritocratic attitudes should be willing

[9] Although some researchers have argued that the allocation of individuals to positions occurred based on meritocratic principles in capitalism and state socialism alike and the differential success of this allocation, or to the meritocratic ideal, was a result of external policies under state socialism that limited post-allocation adjustments (Krauze 1998).

to accept higher income inequality than those who believe in ascription (Kluegel and Smith 1986; Wegener 1992). We expect that meritocratic attitudes are positively associated with fair earnings inequality. However, because in newly post-communist countries meritocracy is less widespread than in traditional market economies (Kunovich and Słomczyński 2007), we expect the positive association between preferred inequality and meritocratic attitudes to emerge only after the new economic system is well established, that is towards the end of our time series.

Hypothesis 2.1: Individuals with stronger meritocratic attitudes tend to tolerate higher levels of earnings inequality, but this association becomes significant only at the end of the period under study.

A different type of attitude closely related to ideas of fair inequality are attitudes toward state's role in mitigating unjust inequalities. Individuals who support welfare state policies are expected to favor lower levels of inequality, but this can only be true in situations with working markets, market competition and the related risk, and at least potentially responsive authorities. We expect the negative association between welfare state support and preferred earnings inequality to emerge after the collapse of communism, which leads us to the following hypothesis:

Hypothesis 2.2: Strong welfare state support leads to lower levels of accepted earnings inequality, and this association becomes significant after the collapse of the communist system.

Individual Changes over Time

In addition to questions about general societal trends, we are interested in how changes in individual status and attitudes are reflected in levels of preferred inequality. We expect that changes in distributions of preferred earnings inequality are not a consequence of compositional shifts of the sample and population, but that they occur within individuals due to their stable and changing characteristics. Our methodological approach allows us to follow changes in preferred inequality as a result of evolving preferences at the individual level over time. First, we expect our panel model to confirm results obtained in single year models—that is, we expect higher preferred inequality among men than women, as well as among the richer and more educated. Second, we expect to observe an effect of meritocratic attitudes (positive) and welfare state support (negative) as they change within individuals over time. Finally, we expect that not only preferred inequality increases with time, as stated in Hypothesis 1, but that the rate of change depends on the initial level at the beginning of our time series, in 1988. Stated differently, while we expect to document greater tolerance for earnings inequality over time, we also note that the degree of this change will be contingent on respondents' initial reports in the first wave of data collection. Those who reported higher ratios of preferred earnings (more inequality) at the time of the first interview will be more likely to demonstrate continued growth over time—they will tolerate even more inequality with a higher rate of change compared to those who initially preferred lower earnings ratios.

The resulting hypotheses are as follows:

Hypothesis 3.1: Accounting for individual heterogeneity, more meritocratic attitudes are positively associated with levels of preferred earnings inequality.

Hypothesis 3.2: Accounting for individual heterogeneity, more welfare state support is negatively associated with levels of preferred earnings inequality.

Hypothesis 3.3: The rate of increase in preferred levels of earnings inequality depends on the starting level of preferred inequality.

Hypothesis 3.4: Men prefer higher levels of inequality than women, and additionally the level of preferred inequality increases with education and income, both across individuals and over time.

Data and Measurement

POLPAN 1988–2003

Data come from the Polish Panel Survey (POLPAN), conducted among a probability sample of the adult population of Poland in 1988 and every five year since.[10] POLPAN is unique in two ways. First, its panel design allows researchers to investigate individual changes in attitudes and preferences about inequality in the context of changing inequality in the wider society. Secondly, the timing of POLPAN overlaps with major events in Poland's recent history, which makes the data ideally suited to analysis of social consequences of political and economic transformation. In the current study we utilize these methodological advantages to examine change over time in respondents' preferred levels of income inequality.

In our analysis we use the first four waves of POLPAN, from 1988, 1993, 1998, and 2003, that is from the year prior to the collapse of communism in 1989, until just before Poland's accession to the European Union in May 2004. Of the 5,817 respondents born between 1922 and 1966 who were interviewed in 1988, a randomly selected 2,500 were approached again in 1993. The sample of the third wave in 1998 consisted of 1,752 panel respondents and a renewal sample of 383 21–30 year olds (Słomczyński and Marquart-Pyatt 2007). Our sample used in this analysis comprises 1241 respondents who participated in all four waves: 1989, 1993, 1998 and 2003.[11] In this sample 48.6% respondents are women, the average age in 1988 was 40.6, and accordingly five years more every next wave.

[10] Data and documentation from POLPAN 1988–2003 are available on-line at Zacat-Gesis (zacat.gesis.org) and the Polish Social Data Archive (www.ads.org.pl).

[11] We restrict the sample to those interviewed on all four occasions, because of our main interest in changes in attitudes among the cohorts that can remember pre-transition Poland from own adult experience instead of knowing it only from second-hand accounts. However, as a robustness check, we have conducted analyses using the whole sample of 6425 respondents interviewed in any of the first four POLPAN waves. The results are substantially the same, and are available upon request.

Dependent Variable: Preferred Earnings Inequality

In the first four waves of POLPAN respondents were asked to estimate current earnings for selected occupations, followed by a question about how much people in these occupations should earn.[12] [13] Sets of occupations differed from wave to wave. In all waves, unskilled workers were on average assigned the lowest earnings (details available upon request). At the top of the earnings ladder, and far above anyone else, respondents put the factory owner ('factory directors' in 1988).

To measure fair earnings inequality, we constructed a ratio of just earnings for the owner of a large factory and the unskilled worker in a factory.[14] [15] This Fair Earnings Ratio shows how many times more factory owners should be paid than unskilled worker in a fair society. The ratio has a strong positive skew, and in subsequent models it is used in logged form. In initial analyses we also track changes in respondents' *perceptions* of earnings inequality in society, or *perceived inequality*.

Meritocracy

We measure meritocratic attitudes using responses to four standard items in the question about "things important for achieving success in life" asked in all POLPAN waves in the same form.[16] These items are: ambition, hard work, good education, and inherited ability and talent, and to each respondents answered using a five-point Likert scale ranging from "absolutely necessary" to "not at all important."[17] The measurement model for the resulting factor is presented in Table 1. Despite some fluctuation in factor loadings from wave to wave, the factor continues to explain about 40% of common variance of the four indicators.

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[12] In 1988 and 1993 these questions was asked in one version of the questionnaire administered to one subsample; in 1998 and 2003 they were included in all versions of the questionnaire. As a result the number of valid responses to the fair earnings items is 350–365 in 1988, 471–586 in 1993, and 885–1176 and 1169–1208 in 1998 and 2003, respectively. Estimates from modeling samples restricted to respondents who were asked the questions of interest in 1988 were substantively the same as the non-restricted models we present in this paper. Non-response was clearly higher in items about fair earnings of highest status jobs, such as owner of factory or director of large enterprise.

[13] Karpiński (2015) notes that a possible bias is introduced as a result of which question respondent's answer first, the 'do-earn' or should-earn' question. However, the ordering of the questions is consistent throughout all waves of POLPAN and we do not expect a systematic bias of this nature.

[14] Because "the owner of large factory" was alien to the centrally planned, state-owned socialist economy, and was therefore not included in the 1988 wave of POLPAN, for that year we took "the director of a factory". As a robustness check, we repeated all analyses using "director of factory" for 1988 and "director of state-owned enterprise" for later waves, and substantive results remained the same.

[15] In two of the four survey waves (1993 and 2003), highest earnings estimates were top-coded as "100,000 or more" in 1993 and "1,000,000 or more" in 2003. The number of cases concerned is 123 and 2 respectively. In order to avoid underestimating the variation in fair earnings, we multiplied the top-coded observations by a factor of 1.3.

[16] The same questions are asked in other surveys, including the International Social Survey Programme or the General Social Surveys.

[17] Similar sets of items have been used to construct meritocracy scales e.g. by Locklear (1998), and Kunovich and Słomczyński (2007).

Table 1

Measurement of Meritocratic Attitudes

Factor loadings	1988	1993	1998	2003
Ambition	0.635	0.566	0.621	0.591
Hard work	0.509	0.520	0.487	0.407
Good education	0.734	0.721	0.701	0.729
Natural ability	0.719	0.731	0.717	0.737
% of variance	42.978	41.151	40.738	39.722
Eigenvalue	1.719	1.646	1.630	1.589
Cronbach's alpha	0.539	0.501	0.479	0.446

Source: POLPAN, waves 1–4.

Welfare State Support

We operationalize welfare state support as a scale consisting of responses to items about responsibilities of the state towards citizens. The question asked respondents about their level of agreement or disagreement (on a 5-point Likert scale) with a number of statements, of which we chose the following three: (E) The state should assist children from poor families in facilitating their access to higher education; (G) The state is responsible for reducing differences in people's incomes; (H) The state should provide jobs for everyone who wants to work. We constructed a standardized scale, where positive values indicate above average support for the welfare state, and negative values indicate below average support (Table 2 shows the measurement model).

Table 2

Measurement of Welfare State Support

Factor loadings	1988	1993	1998	2003
State should help kids from poor families	0.750	0.694	0.621	0.648
State should decrease inequality	0.699	0.761	0.768	0.737
State should provide jobs	0.742	0.775	0.799	0.779
% of variance	53.368	55.329	53.756	52.348
Eigenvalue	1.601	1.660	1.613	1.570
Cronbach's alpha	0.550	0.587	0.562	0.525

Source: POLPAN, waves 1–4.

Income and Other Independent Variables

Household income *per capita* was constructed by using household income divided by the number of members of the household, logged and standardized, to achieve a common metric across waves. Other independent variables include gender, coded with a binary variable with 1 for male (49% of our sample are women), age measured in years, and education measured in years of schooling.[18]

[18] Original questionnaires asked respondents about their level of education with categorical responses, which were then assigned numeric values.

Models

To test the first set of hypotheses, 1.1 and 1.2, we analyze medians of perceived and preferred earnings for the owner of a large factory and unskilled worker, and respective earnings ratios. To test the remaining hypotheses, we use two types of models. Hypotheses 2.1 and 2.2 refer to patterns present at each point in time and how these patters change from wave to wave. We test these hypotheses by examining and comparing regression coefficients from OLS regression models, separate for each survey wave.

Hypotheses 3.1–3.4 have to do with changes in ideas about fair earnings inequality that have occurred within individuals over the 15 years covered by our data, while accounting for individual heterogeneity. In analysis using the whole dataset we use multi-level mixed-effects linear regression models, which take into account the hierarchical structure of the data (see Rabe-Hesketh and Skrondal 2008). We are interested in estimating the effects of both time-variant variables, that is income, meritocratic attitudes and welfare state support, as well as characteristics that are stable within respondents, like gender and education. This is why we chose random effects models over fixed effects models, which are designed to study the causes within persons and do not allow to estimate effects of time-invariant characteristics (Kohler and Kreuter 2009). The random intercept model takes the following form:

$$\ln(\textit{fair ratio})_{ij} = \beta_0 + \beta_1 occasion_i + \beta_2 sex_j + \beta_3 age_{ij} + \beta_4 yearsedu_{ij} + \beta_5 hhincomepc_{ij} + \beta_6 meritocracy_{ij} + \beta_7 statepat_{ij} + u_j + \varepsilon_{ij}$$

where $\ln(\textit{fair ratio})_{ij}$ is the log transformed fair earnings ratio for the j^{th} individual in the i^{th} measurement occasion, β_0 is the grand intercept, β_1 is the coefficient for the measurement occasion (occasion 0 is the year 1988), β_2 is the coefficient for sex of the j^{th} individual, and β_3, β_4, β_5, β_6 and β_7, are coefficients for age, years of education, household income per capita, meritocracy and welfare state support of j^{th} individual in the i^{th} measurement occasion respectively. Further, u_j is the random intercept for the j^{th} individual, and ε_{ij} is the random error term corresponding to the deviation of the j^{th} individuals ln(fairratio) from u_j. The second model includes a random intercept and slope, and is represented by the following equation:

$$\ln(\textit{fair ratio})_{ij} = \beta_0 + \beta_1 occasion_i + \beta_2 sex_j + \beta_3 age_{ij} + \beta_4 yearsedu_{ij} + \beta_5 hhincomepc_{ij} + \beta_6 meritocracy_{ij} + \beta_7 statepat_{ij} + u_{1j} occasion_j + u_{0j} + \varepsilon_{ij}$$

Here u_{1j} is the slope random effect on occasion, so this model frees the slope to allow for differential effect of time across individuals.

Results

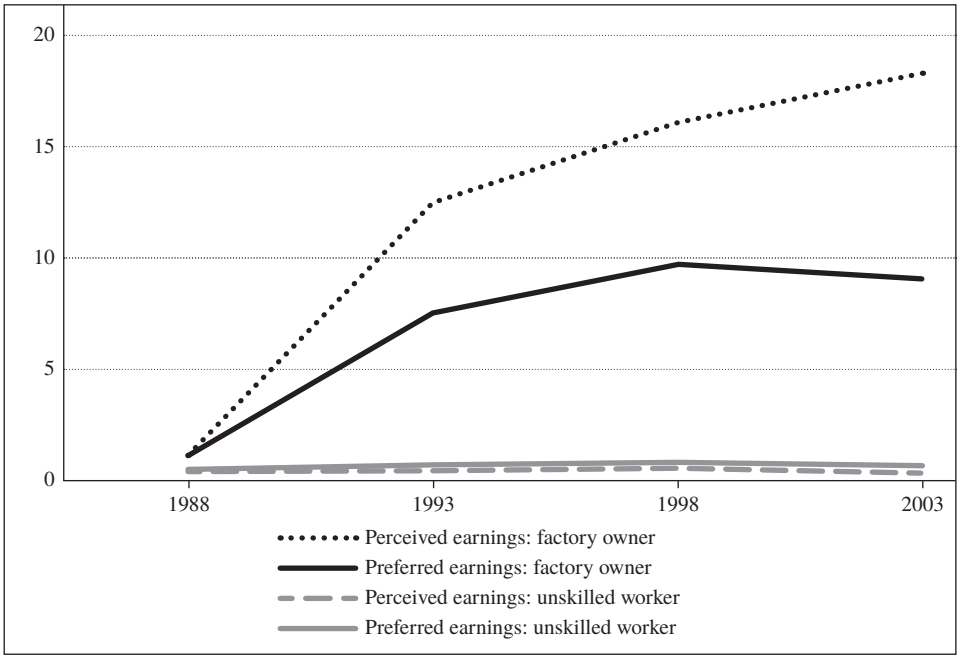
Descriptive Results: Change in Levels of Perceived and Preferred Inequality

In order to look at changes in perceived and preferred inequality, we computed medians of two ratios constructed for each individual. The first divides perceived earnings of a factory

owner by perceived earnings of an unskilled worker, while the second does the same with preferred earnings. Before we focus on these ratios, we would like to present changes in the underlying measures. Figure 2 shows medians of perceived and preferred earnings of the two occupations of interest: the owner of large factory and unskilled worker, expressed as the number of average monthly wage in Poland in the same year.[19]

Figure 2

Medians of Perceived and Preferred Monthly Earnings of Factory Owner and Unskilled Worker as Number of Mean Monthly Salaries in the Given Year



Source: POLPAN 1988–2003.

The graph shows that median perceived earnings of a hypothetical factory owner increased 16 fold in the 15 years, from 1.13 of average salary in 1988 to over 16 times the average salary in 2003. The increase in preferred earnings for the same occupation was lower by half: from the same 1.13 monthly salaries in 1988 to about 8 monthly salaries in 2003. The simultaneous change in perceived earnings of unskilled worker was non-linear: it increased from 0.38 of the monthly salary in 1988 to 0.5 in 1993 and 0.56 in 1998, and then dropped back to 0.36 in 2003. Preferred earnings increased by some 40%, from 0.49 to 0.68 of the average monthly salary.

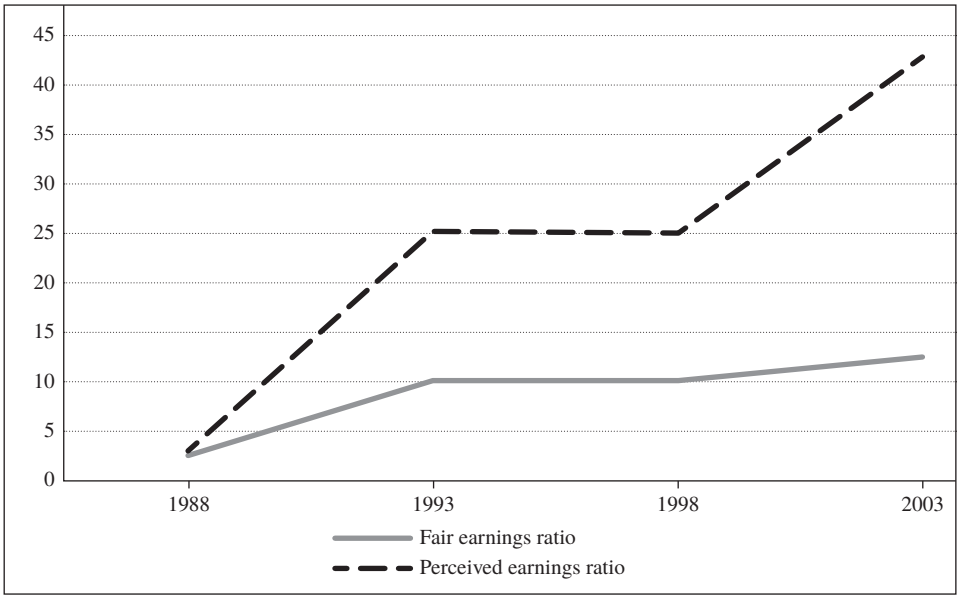
Median ratios of perceived and preferred earnings shown in Figure 3 confirm what could already be inferred from the previous graph: both perceived and preferred earnings

[19] Central Statistical Office. Average monthly gross wage and salary in national economy (1950–2012). Retrieved December 31, 2013 (http://www.stat.gov.pl/gus/5840_1630_ENG_HTML.htm).

inequality increased between 1988 and 2003, and the income gap perceived by individuals has been growing considerably faster than what people would consider just and fair. In 1988, on average, factory owners were perceived to earn 2.8 times more than unskilled workers, while the preferred difference would be slightly smaller, that is 2.4. In 1993 both ratios increased, the preferred ratio to 10, and the perceived to 25, and both remained unchanged in 1998. At the end of our time-series, in 2003, factory owners were believed to earn almost 43 times more than unskilled workers, with the median preferred or fair ratio equal to 12.5. Although compared to the surge in the perceived earnings gap the change in fair earnings ratio may look moderate or even insignificant, it needs to be kept in mind what the numbers represent. The increase in the fair earnings ratio from 2.4 to 12.5 means that in the 15 years 1988–2003 the socially accepted or preferred gap between lowest and highest earnings increased five-fold, which indicates a major shift in normative beliefs about distributive justice.

Figure 3

Medians of Perceived and Preferred Monthly Earnings Ratios



Source: POLPAN 1988–2003.

In general, these findings support Hypotheses 1.1 and 1.2. However, the unequal rate of change in both perceived and preferred inequality, and in particular the stagnation between 1993 and 1998, require more in-depth analysis.

By-wave Rgression Results: Meritocracy and Welfare State Support

The composition and magnitude of determinants of preferred earnings inequality have changed over time, and these changes reveal some interesting patterns. According to single-

wave models presented in Table 3, in 1988 preferred inequality was significantly associated (positively) only with socio-demographic measures of age, education, and income, but not gender, nor any attitudinal variables. In 1993 support for the welfare state becomes a significant, negative, predictor of preferred inequality, and remains significant despite losing some magnitude in the following waves. Meritocratic attitudes remain insignificant until the last measurement in 2003, when their association emerges as positive, although not particularly strong. These observations support Hypotheses 2.1 and 2.2. Additionally, by-wave models confirm prior findings about preferred inequality increasing with education and income, as well as the higher tolerance of inequality among men, although only after the transition started.

Table 3

By-wave OLS Regression Models of Logged Fair Earnings Ratio on Meritocratic Attitudes and Welfare State Support, and Sociodemographic Characteristics.

ln (fair ernings ratio)	1988		1993		1998		2003	
	B	beta	B	beta	B	beta	B	beta
Constant	0.285*		1.862***		1.791***		1.794***	
Age	0.005*	0.134	–0.009*	–0.099	–0.001	–0.012	0.001	0.008
Gender (1M)	0.059	0.067	0.316***	0.165	0.146*	0.075	0.258***	0.127
Education (years)	0.035***	0.274	0.068***	0.236	0.051***	0.167	0.054***	0.159
Income	0.085**	0.185	0.067	0.068	0.037	0.037	0.108**	0.105
Meritocracy	0.032	0.074	0.065	0.064	–0.033	–0.033	0.077*	0.076
Welfare State Support	–0.008	–0.018	–0.135**	–0.137	–0.131**	–0.130	–0.104**	–0.099
R2	0.175		0.165		0.071		0.098	
Adj. R2	0.158		0.153		0.063		0.093	

* < 0.05, ** < 0.01, *** < 0.001

Source: POLPAN, waves 1–4.

Panel Regression Results

The final step of our analysis is modeling our data taking into account their panel structure. According to the empty model (Model 0) in Table 4, 9.7% of the total variation in the dependent variable, logged preferred earnings ratio, can be attributed to level-two units, in our case individuals. Model 1 adds the time variable (the occasion of measurement), and socio-demographic characteristics, of which age, education, and income are time-varying, and gender is time-invariant. All these predictors, with the exception of age, are highly statistically significant with coefficients pointing in expected directions. First, estimates show that preferred earnings inequality increased over time, and the increase by 0.418 units of logged preferred ratio from occasion 0 in 1988 to occasion 1 in 1993 is equivalent to the increase in (unlogged) preferred earnings ratio by 2.618, holding all other factors constant. As in earlier by-wave models, the multi-level models also show that on average men prefer higher levels of inequality, and after unlogging the difference in preferred earnings ratio is 1.722. Finally, preferred inequality also increases with education and income.

Table 4

Multi-level Mixed-effects Linear Regression Models of Logged Fair Earnings Ratio on Meritocratic Attitudes and Welfare State Support, and Sociodemographic Characteristics

ln (fair earnings ratio)	Model 0 (Empty)		Model 1 (Level 1 & 2 Vars)		Model 2 (+ Attitudes)		Model 3 (Random slope)	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Fixed Effects								
Intercept	2.269	0.0217	0.623***	0.127	0.761***	0.132	0.760***	0.130
Occasion			0.418***	0.020	0.406***	0.021	0.412***	0.020
Age			–0.001	0.009	–0.001	0.002	–0.001	0.002
Gender (1M)			0.236***	0.040	0.211***	0.041	0.208***	0.041
Education (years)			0.068***	0.007	0.059***	0.007	0.058***	0.007
Income			0.090***	0.022	0.072**	0.023	0.070**	0.023
Meritocracy					0.040*	0.020	0.039*	0.019
Welfare State Support					–0.096***	0.021	–0.093***	0.021
Random Effects								
Level 2 (ind) Var	0.113	0.270	0.090	0.023	0.087	0.024	0.013	0.006
Level 1 Var	1.050	0.036	0.815	0.030	0.808	0.031	0.763	0.029
Slope (occasion)							0.013	0.006
Cov (occ, cons)							0.013	0.004
Fit								
Deviance	8516.447		7299.766		6815.961		6798.347	
AIC	8522.447		7315.766		6835.961		6822.346	
BIC	8540.32		7362.896		6894.225		6892.264	

* < 0.05, ** < 0.01, *** < 0.001

Source: POLPAN, waves 1–4.

Model 2 adds attitudinal variables, meritocratic attitudes and welfare state support. Both are statistically significant, and in expected directions. Furthermore, the addition of these attitudinal measures only slightly reduces the magnitude of socio-demographic predictors without replacing their explanatory power. An increase by one standard deviation on the meritocracy scale leads to an increase in preferred earnings ratio by 1.096, while a similar increase on the welfare state scale decreases the preferred ratio by 0.802. These findings support Hypotheses 3.1 and 3.2.

Both previous models, Model 1 and Model 2, were random intercept models, so they allowed different intercepts between individuals. The last model, Model 3, is a respecification of Model 2 with a freed slope, and hence accommodates differences in the rate of change between individuals, in addition to their starting points. A log-likelihood test confirmed that the model with individual-specific regressions better fits the data than the one with only individual-specific shifts. Compared to Model 2, in Model 3 all coefficients remain roughly unchanged, and the positive covariance of occasion and individual mean indicates higher rates of growth among those who preferred higher inequality in occasion 0, which supports Hypothesis 3.3. Estimates in all models confirm association patterns between preferred levels of earnings inequality and gender, education, and income, which were the subject of Hypothesis 3.4.

Conclusion

Using a unique and well-suited dataset, the current study makes a number of contributions to the analysis of inequality attitudes and toward stratification research more broadly. First, the use of panel data from POLPAN enables us to trace individuals' evolving preferences for what inequality in a society ought to look like, which overcomes a major impediment in previous studies. Specifically, preferred levels of income inequality rise in accordance with actual and perceived increases in economic inequality. It follows that inequality attitudes are shaped by what objectively exists and that notions about what 'ought to be' will be adjusted to align with the current situation. This finding provides support to social-psychological theories which emphasize the preference for maintaining consistency (Trump 2013) with contextual changes.

Our analyses also confirm earlier results that higher preferred levels of inequality are reported by men, those with more education, and those with higher incomes (Kelley and Evans 1993). Additionally, those who place greater emphasis on meritocracy permit higher ratios of inequality, while those who show stronger support for the welfare state prefer lower ratios. However, we find that attitudinal effects for meritocracy only become significant later in our time series. In other words, it took time and systemic change for meritocratic beliefs to take hold and play a role in individuals' perceptions of 'just' inequality. Once established, it is possible that the magnitude of these meritocratic beliefs (initially spurred on by structural change) will strengthen over time and lay the foundation for continued change in this direction.

A number of questions remain to be answered in future research. Our analysis with panel data is an improvement in many ways, but it comes with its own set of challenges. For example, additional analyses of generational effects and tests using lagged effects for each measurement occasion may provide a more nuanced discussion of both changes over time and across birth cohorts. Furthermore, we argue that levels of preferred inequality rise along with increases in actual or perceived inequality, but it is not clear what constitutes the precise ratio of change (or what circumstances lead to varying ratios of change). Last, future predictions represent a formidable challenge. Assuming economic inequality continues to rise in Poland, will citizens gradually increase their preferred levels of inequality as well? Our hope is that future waves of POLPAN will provide insight to these questions and promote a better understanding of how exactly individuals' inequality attitudes change over time. In the current study we have used the best available data to track these types of changes and to provide a foundation for future studies in this regard.

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