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INCOME INEQUALITY AS A CANADIAN COHORT AGES:  AN

ANALYSIS OF THE LATER LIFE COURSE

STEVEN G. PRUS

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# Income Inequality as a Canadian Cohort Ages:

## An Analysis of the Later Life Course

**STEVEN G. PRUS**
**McMaster University**

*Abstract*

At each stage of the life course, people experience different economic situations. Retired people, for example, draw the majority of their incomes from the pension system rather than the labour market. Using Survey of Consumer Finances cross-sectional data from 1973 to 1996, this paper examines Canadian trends in income inequality over the middle and later stages of the life course of a synthetic cohort born between 1922 and 1926. Three hypotheses regarding changes in the level of income inequality during later life are tested: income is 1) distributed more equally; 2) distributed about the same; or 3) distributed less equally, in the retirement years than in the working years. Using Gini coefficients, the findings show that income inequality decreases within a cohort as it grows old; that is, the Canadian retirement income system smooths out (levels) the distribution of income in later life. The observed decrease in inequality corresponds with a decrease in income from earnings and an increase in dependency on state benefits. The progressive nature of public pension programs in Canada increases the relative income share and the average income of the poorest seniors. Moreover, Canada exhibits a more equal distribution of income in old age compared to countries with similar old-age welfare systems, such as the United States. Any reform toward privatization of the retirement income system in Canada will jeopardize the ability of the state to reshape income inequalities in later life.

*Introduction*

*Most inequality studies have focused* on the entire population, making no distinction between retired people and people of working age. Brought on by an aging population (especially the aging of the "baby boom" generation) and the universal practice of retirement, academic interest and research on the economics of aging have grown over the last few decades. This paper makes a contribution to the literature on economic well-being in later life by estimating patterns of income inequality within a cohort (i.e., those born between 1922 and 1926) as it ages over the later stages of the life course.

Many of these cohort members worked a significant part of their careers in the first 25 years after World War II, which saw a rapid increase in real earnings, steady employment, and returns on investments (Myles 1996). Most Western, capitalist countries also experienced substantial growth in their pension systems during this period (Schulz 1996). Most of these cohort members have benefited from, for example, the increased accessibility to private and public pension plans and the gradual maturing of private retirement savings accounts.

This study tests three prevailing models of income inequality and the later life course using Canadian income data. These models make a judgment on the direction of the dispersion of income as a cohort grows old. The conclusion will help determine if expansion of the old-age welfare system and of the economy in the post-World War II period has led to a leveling process in the distribution of income in old age.

*The Economic Well-being of Canadian Seniors*

According to Canadian Census data, estimates of poverty in old age were relatively high in Canada until the early-1980s. Today, the poverty rate for the aged in general is relatively low and is almost equal to the level for the rest of the population - about 20% of elderly-head families have an income below the poverty line. Current trends in old-age poverty reflect above average increases in median real income of seniors. The improved economic situation of Canadian seniors is linked to the expansion and maturation of Canada's three-tier retirement income system (Oja and Love 1988).

The first tier of the pension system is comprised of the Old Age Security (OAS) program. Funded by general tax revenues of the federal government, it includes a semi-universal old age pension[1] and income-tested income supplements (i.e., Guaranteed Income Supplement - GIS - and Spouse's Allowance - SPA) for old age pensioners and their spouses. The second level of the retirement income system consists of the Canada and Quebec Pension Plans (C/QPP). This government-regulated program is entirely funded by employer and employee contributions and provides basic pension income for those who were in the work force. While OAS benefits are not tied to employment and earnings histories, C/QPP benefits are solely determined by contribution amounts made to the plan during the working years. The third tier of the retirement income system consists of private (employer-sponsored) pension plans and personal retirement savings plans. These plans are privately administered but publicly subsidized (i.e., contributions to these plans are tax deductible).

While the Canadian aged are better off now than in the past, they are not a homogeneous group. If the financial condition of sub-groups of older people is examined, it is evident that particular groups of seniors (e.g., unattached elderly women, Native peoples, persons with limited education) have a disproportionate percentage of individuals with meager economic resources. The improved general income picture yet high rates of poverty for certain Canadian seniors suggest two things. First, many seniors have been left behind by the post-World War II economic boom and improvements to the pension system. Increases in median real income are essentially the result of the improved incomes of wealthier seniors. Second, income inequality is a significant problem in later life.

*Three Models on Income Inequality over the Later Stages of the Life Course*

It remains unclear in the Canadian research literature whether the overall level of income inequality within a cohort over the later stages of the life course increases, remains the same, or decreases. This is an important question because there is a fundamental change in sources of income from the labour market to the retirement income system in old age (i.e., at age 65). In other words, an analysis of intracohort income inequality during old age provides insight into the equalizing impact of pension systems in Canada, notably public transfers and programs.

*RISING TIDE/TRANSFER REDISTRIBUTION MODEL*

Varying assumptions about the effect of public pension policy on the distribution of income in later life have led to three models of economic well-being and the later life course. The first model is the "rising tide" (Crystal and Shea 1990a) or transfer

redistribution (Pampel and Hardy 1994a) model. According to this model, a primary goal of public welfare systems is to redistribute income from the rich to the poor (Myles and Quadagno 1994). Public pension benefits are therefore more equally distributed than income generated from the labour market. The unskewed distribution of public benefits results from the political process and the bargaining power of labour inside the state (e.g., Myles 1989; Pampel and Hardy 1994a). Since each person carries an equal weight in the democratic process, the state, unlike like the labour market, is compelled to ensure the well-being of all citizens. In the end, a progressive public pension system, which becomes a key source of income for seniors, reduces the overall level of income inequality in old age relative to middle age.

Using data from the 1976 Survey of Consumer Finances, Myles (1981) finds some support for this model in Canada. He observes that public policy (measured in terms of public pensions and taxes) has a leveling or equalizing effect on the rate of absolute and relative income inequality across socio-economic groups in old age. Looking at the income returns of education in old age, Myles finds that the Canadian tax system is largely responsible for the reduction of the absolute level of income inequality (i.e., differences in the distribution of income measured in dollars). While public policy on average reduces absolute income differences across educational groups by 20%, most of this change is the result of the tax system. On the other hand, relative income inequality (i.e., differences in the income distribution measured in relative position) is primarily reduced by the transfer system.

A longitudinal analysis of the incomes of 11,000 people born between 1906 and 1911 over a 10-year period (1969 to 1979) by Hurd and Shoven (1985) shows support for the rising tide model in the U.S. Using information provided by Hurd and Shoven, the calculated average total household income (in 1968 dollars) of sample members in the lowest 10% of the income distribution increases from $1,362 in 1968 (when most members were still employed) to $2,179 in 1978 (when most had left the work force). Conversely, the average household income of all sample members fell from $8,246 to $6,768 over this period, and the wealthiest people (i.e., those in the top 10% of the income distribution) experienced an even larger decline - from $15,689 in 1968 to $12,248 in 1978. While these statistics do not measure overall inequality in a distribution, they do give some credence to the rising tide model that the welfare system helps to reduce income inequality during the retirement years.

The effectiveness of the old-age public welfare state in reducing income inequality has been seriously questioned. While most systems of taxation and transfer payments are progressive, other scholars argue that their equalizing effects are diminished by the unequal distribution of income from private sources (e.g., private pensions, investments, and savings). However, the degree to which the leveling effects of public policy is offset by private sources of income is also subject to debate, and help distinguish the following two perspectives.

*STATUS MAINTENANCE MODEL*

The second model of income inequality and the later life course - status maintenance (Henretta and Campbell 1976) - holds that policies and programs in "liberal," market-oriented welfare states (i.e., welfare systems that provide income-tested assistance, some universal benefits, and/or modest social insurance benefits), such as Canada, the U.S., and the U.K., play an insignificant role in reshaping old-age income inequality (Esping-Andersen 1990). This is because the public pension system in these countries is comprised of programs that act both to equalize incomes (e.g., GIS in Canada and Supplemental Security Income in the U.S.) and to reinforce pre-retirement inequalities by favoring those who made higher contributions over the life course (e.g., C/QPP and Social Security). The fact that liberal social policies are primarily concerned with maintaining, not changing, economic status and inequality in retirement is also reflected in these governments' support for private sector solutions for income security and maintenance in old-age, the subsidization of the private welfare system through tax incentives, and meager public pension benefits (Esping-Andersen 1990).

Some support for this model is found in research on income differences between socio-economic groups before and after retirement by Henretta and Campbell (1976). Their findings show that the determinants of income prior to retirement remain strong indicators of income in retirement. Looking at a synthetic cohort of men aged 55 to 64 in 1962 and aged 66 to 77 over a decade later, they find that the variables (e.g., occupational status) with the biggest effects on pre-retirement income have almost identical influences on income in retirement. Pampel and Hardy (1994b) repeat similar findings in a longitudinal study.

*CUMULATIVE DIS/ADVANTAGE/STATUS DIVERGENCE MODEL*

The third model of income inequality and the later life course is the cumulative advantage/disadvantage (Crystal and Shea 1990a) or status divergence (Pampel and Hardy 1994a) model. This model suggests that despite the redistributive goal of public pension benefits, the existing retirement income system produces more income inequality than the labour market because economic advantages and disadvantages cumulate over the life course. Individuals with high status attainment as a result of high parental socio-economic status and/or human capital investment are, on average, financially well off during the working and retirement years. This is because higher education translates into a good job - one that offers relatively high wages with career prospects, favorable working conditions, opportunities to acquire on-the-job skills, employment stability, and fringe benefits - and health. In turn, these individuals are less likely to suffer illness or occupational injury or to be forced to retire due to poor health or unemployment, and are more likely to have above average lifetime income and accumulate savings, investments, pension credits, and other assets (Crystal and Shea 1990a).

The opposite is true for those with status background disadvantages - individuals with fewer early economic opportunities and resources. They are more likely to be forced into retirement or early retirement by poor working conditions and health, redundancy, unemployment, and job loss (Tindale 1991), and experience a loss of labour income coupled with little or no resources to replace this income (Pampel and Hardy 1994b). They tend to rely almost exclusively on government benefits that operate at the margins (O'Rand 1996).

The accumulation of economic resources for some individuals, and the economic perils that old age brings for others, implies two problems. One, there will be a grossly unequal distribution of retirement income from private sources. Given that public pensions in liberal, market-oriented welfare state regimes are designed to provide seniors with only a limited portion of pre-retirement earnings, it will also outweigh the redistributive function of government transfers. Two, the overall level of income inequality within a cohort will expand with advancing age.

This model has found more empirical support (especially in the U.S.) than either the rising tide/transfer redistribution or status maintenance models. Using data from the U.S. National Longitudinal Survey of Older Men, Crystal and Waehrer (1996) and Pampel and Hardy (1994a) report that the level of relative income inequality within a cohort increases over the later stages of the life course. Multiple cross-sectional analyses of income inequality rates across age groups in the U.S. also lend support to the cumulative advantage/disadvantage model (e.g., Crystal 1996; Crystal and Shea 1990a; Hedstrom and Ringen 1990).

This paper determines which of the three models of income inequality and the life course best fits the Canadian situation. The methodological choices made in this study, however, are first considered.

*Methodological Approaches on Income Inequality and the Life Course*

The aim of this study is to compare the distribution of income before and after the transition to retirement.[2] It is important to detail all aspects of the choices made here because studies of income inequality are understandable only in reference to the methods used. Two researchers using the same data set and studying the same problem could produce different results due to differences in methodological approach. The methodological choices made here are based on the appropriateness, comparability, and validity of the measures. The methodological topics discussed below are grouped into

four categories: data sources, operationalization of income, data adjustments, and inequality estimation techniques.

*DATA SOURCES*

The data used here come mainly from the Canadian Survey of Consumer Finances (SCF). The SCF is produced annually by Statistics Canada. The SCF contains a comprehensive series of economic indicators, with each file providing data on a representative sample of approximately 25,000 households. In total, the SCF represents more than 97.5% of the Canadian population (Statistics Canada 1997).[3]

The study of income dynamics ideally requires long-term, longitudinal data; however, such data are not generally available in Canada. This shortfall is overcome by deriving estimates of income inequality over the life course from a series of cross-sectional data. Persons born between 1922 and 1926 are selected from about every fifth cross-sectional file, starting in 1973, of the SCF.[4] To control for the effects of the business/economic cycle, SCF data are selected for years in which labour market conditions (measured by national unemployment rates) are similar. Thus, data from the 1973, 1981, 1986, 1991, and 1996 SCF are used.[5] The degree of income inequality within this "synthetic" cohort is calculated from each file. In the end, the level and path of inequality for this birth cohort is estimated over a 23-year span (i.e., 1973 to 1996).[6]

While the overall goal of this paper is to examine the dynamics of income over the later life course of a Canadian cohort, levels of old-age income inequality across nations are also compared.[7] The analysis of income inequality across countries with different retirement income systems provides a better understanding of the redistributional impact of a country's pension policies (Crystal 1996). The equalizing effect of pension policy in selected countries is tested with Luxembourg Income Study (LIS) data, which are a collection of income data that have been made comparable by aggregating/disaggregating income components from specific countries into universally consistent income classifications (e.g., private pensions, means-tested cash benefits) (for a more complete description of the LIS, see Smeeding, O'Higgins, and Rainwater 1990).

*MEASURING INCOME*

While the SCF provides estimates of income distribution every year, it also covers wealth. A wealth survey, however, has not been conducted since 1984. Given the inconsistency of wealth data, income is used as the sole measure of economic well-being over the life course.[8] Since personal income can underestimate the economic well-being of individuals who depend on the resources of other family members, this study uses a broader income measure - total annual money income received from all family members from all sources, minus direct taxes (i.e., income tax and social insurance contributions).[9] Families are grouped according to the age of the family head. Hence, this study uses the

family head as the unit of analysis and family income as the income measure.[10]

*DATA ADJUSTMENTS*

This section describes the adjustments made to the measure of income used in this study. Minor modifications are made to make the data more robust and indicative of the actual income of people. Adjustments for family size and for underreporting of some income components in survey data are discussed below.

When using family income as the income measure, adjustments must be made for family size (Crystal and Shea 1990b). Using unadjusted family income underestimates the aged's income because non-aged families typically share their income with more people. The literature offers various equivalence scales for such adjustments (see Atkinson, Rainwater, and Smeeding 1995), and there is no general agreement as to the best equivalence scale (Crystal and Shea 1990b). A common method in controlling for family size is to produce family income on a per capita basis (i.e., total family income divided by the number of persons in the family). Since this approach does not take into account the "economies of scale" in families, it underestimates family resources. This study therefore assumes that family income adjusted for family size, *I*, equals total family income, *f*, and family size, *s*, in this manner:

$$I=f/s^e$$

where *e*, the equivalence elasticity, is .5.

Some studies adopt an equivalence elasticity equal to the adjustments used by government agencies in determining official poverty lines, while other equivalence scale values are based on different knowledge (e.g., consumer expenditure studies) (Atkinson et al. 1995). Total family income divided by family size raised to the power of .5 (which is equal to the square root of family size) offers an intermediate between using per capita income and using no adjustment for family size. Consistent with many income distribution studies (e.g., Atkinson et al. 1995; Myles and Quadagno 1994; Rainwater, Rein, and Schwartz 1986), this paper uses this equivalence scale. Hence, family income is divided by: 1.0 for a one-person family, 1.41 for a two-person family, 1.73 for a three-person family, and so on. In other words, a family of two, for example, needs 1.41 times the income of a one-person family to be equally well off.

The second adjustment made to the data is for the inaccurate reporting (intentionally or unintentionally) of income (Crystal and Shea 1990b). By comparing SCF income estimates to actual figures from national accounts, Statistics Canada (1997) points out that survey estimates of earnings, most government transfers (including public pension income), and private pension income are reported accurately; however, SCF estimates of other main income types - notably social assistance and investment income - are severely

underreported.

The SCF-National Accounts reconciliation for the years analyzed in this study show that the SCF estimates of average income from investments are underreported by: 33% in 1973, 33% in 1981, 40% in 1986, 50% in 1991, and 45% in 1996. On average, the SCF estimates of income from social assistance are underreported by about 35%. Accordingly, income from investments and social assistance is adjusted for the degree of underreporting for both of these sources. This is especially important because investments are an important source of income for many persons in later life.

A related problem in survey research is missing data. Missing values can affect data analysis in many negative ways. To compensate for the non-reporting of some or all income details in the SCF, Statistics Canada uses an imputation procedure (Statistics Canada 1992).[11] That is, income information for "income non-respondents" is imputed from "income respondents" with similar social, demographic, and economic characteristics.[12]

### STATISTICAL TECHNIQUES: EMPIRICAL MEASURES OF INEQUALITY

One of the most commonly used and recognized measures of inequality - the Gini coefficient (G) - is used here. Generally speaking, G satisfies the "desirable" conditions of a robust measure of inequality (Love and Wolfson 1976). One of the most important conditions is mean or scale independence. This condition is met if changing the units of measurement of income (e.g., from dollars to 25 cent pieces) leaves the inequality measure unchanged. In other words, the measure is unaffected by increasing all incomes proportionately. A scale free index (i.e., independent of the units of measurement of income) is a relative measure of inequality that can be used to make comparisons across distributions.

Another condition that differentiates measures is the condition of transfer. This condition is satisfied if a measure of inequality is reduced when a transfer of income is made from a richer to poorer person or vice-versa. While G meets this condition, it is more sensitive to changes that occur in the middle of the distribution. Hence, the coefficient of variation (CV), which is more sensitive to changes among the very rich or the very poor, is also computed.[13] A comparison of both measures offers some compensation for this sensitivity bias in each of these measures; hence, providing more valid findings.

The G and CV are very popular measures of inequality due to their intuitive ease of interpretation. They are both summary devices that provide a single number measure of relative inequality. G ranges from zero to one. If everyone had the same income, G would be zero; conversely, if all incomes were held by just one individual, the coefficient would be almost one.[14] For that reason, the higher the G, the more inequality that exists. The

mathematical expression for G presented by Jenkins (1991) is:

$$G = 1 + (1/n) - [2/(n^2 \boldsymbol{m})] \sum_{i=1}^{n} (n - i + 1) y_i$$

where families are ranked by income in descending order, $y_i$ is the income of the $i$th family, $\boldsymbol{m}$ is the mean income, and $n$ is the number of cases.

The CV is the square root of the variance divided by the mean. A CV of zero indicates no inequality within a distribution; however, its upper limit, in theory, is infinite. The upper limit of the CV can be confined to a maximum of one by a basic conversion: CV/(CV+1). Transformed CVs are used here in order to make more direct comparisons with Gs.

*Results*

### INCOME INEQUALITY IN MIDDLE AND OLD AGE

The extent of inequality in family income for all Canadian family heads born between 1922 and 1926 is compared across time in Table 1.[15] As reflected in the third row of Gini coefficients, income inequality steadily increases from ages 47 to 64 (1973 to 1986). However, the most dramatic increase occurs between the ages of 55-59 and 60-64; the Gini ratio rises from .318 in 1981 to .360 in 1986. This is more than a 10% increase over this period.

Table 1 about here

This rise in the level of income inequality can be explained by the fact that while many older persons around this age remain in the work force, a substantial percentage of them either voluntarily or involuntarily exit the labour force or reduce the numbers of hours they spend working. While only one-fifth (20.9%) of all family heads aged 55-59 did not work (either part-time or full-time) in 1981, almost one-half (48.1%) of heads aged 60-64 was completely removed from the labour force in 1986. Since most federal and provincial income programs and other state benefits are not available until age 65, the incomes of persons under 65 years of age with little or no employment earnings can be significantly reduced, increasing the overall rate of income inequality.

The second trend observed in Table 1 is the steady decline in the level of income inequality in old age.[16] This pattern of inequality is compatible with the rising tide/transfer redistribution model. In 1991, when cohort family heads reach the ages of 65-69, inequality is dramatically lower compared to five years earlier (i.e., .360 in 1986 vs. .305 in 1991) - this is a decrease of over 15%. The level of inequality further falls to .286 in

1996 (ages 70-74). The decline in the rate of income inequality during old age is related to factors such as a decrease in the chance of being employed, savings and investment depletion, and, consequently, an increase in reliance on state benefits with advancing age, especially among the well-to-do seniors.[17] [18]

*SEPARATING AGE, COHORT, AND PERIOD EFFECTS*

An important question is to what extent is the observed pattern in income inequality over the life course the result of age, cohort, and period effects. While it is possible to separate age and cohort effects with the synthetic-cohort method used here, it is more difficult to separate age from period/time of measurement effects. Period effects can influence the economic well-being of a cohort at two points in time since one period may be defined by, for example, high economic growth or low unemployment while another is marked by economic recession or high unemployment. To control for the effects of the business cycle, data are selected from years where labour market conditions are similar (measured by national unemployment rates). However, other period effects are also likely to influence economic well-being (e.g., increased spending on social programs, changes in C/QPP and private pension programs). Changes such as these have likely contributed to some extent to the trends observed in Table 1, making them unique to cohort members born between 1922 and 1926.

To isolate year of measurement (i.e., period) effects from age effects (at least any period effects that occurred between 1973 and 1996), levels of income inequality before and after retirement for three cohorts are shown in Table 2. This table displays a matrix consisting of Gini coefficients for three five-year birth cohorts (i.e., family heads born between 1917-1921, 1922-1926, and 1927-1931) at various points in time and ages.

Table 2 can be read in different ways to determine the impact of period effects. First, by reading the table diagonally, rates of income inequality for the younger, middle, and older five-year cohorts at different points in time, but the same age, can be compared. It is observed that the magnitude of inequality at ages just prior to retirement (i.e., 60-64) is almost the same across the three observation years. A comparison of Gini coefficients for the three cohorts in the ages immediately after retirement, however, reveals somewhat more difference. At ages 65-69, the Gini ratio is .282 for the younger cohort, but .316 for the older cohort. The Gini coefficient for the middle cohort falls between these two values (i.e., .305). The difference in the level of income inequality for the younger and older cohorts in old age makes sense since the Canadian public pension system, which is a primary source of income for lower and middle class seniors, changed between 1986 and 1996 (e.g., the maturation of the C/QPP and the OAS claw-back).

Table 2 about here

Second, by reading down Table 2 cross-sectional age differences are obtained. In 1991,

the rate of income inequality decreases from .364 among those of pre-retirement age (60-64) to .305 among those of post-retirement age (65-69). A similar pre/post-retirement pattern is also observed in 1986. Third, Table 2 can be read across. The level of income inequality drops significantly as family heads from the youngest cohort reach retirement: between 1991 and 1996 the rate of inequality falls from .364 to .282. However, the rate of inequality is more stable for the oldest and middle cohorts between these years. Further, all cohorts experience a substantial drop in the degree of inequality as they reach old age at different points in time (i.e., 1986, 1991, and 1996).

In conclusion, the impact of period effects between 1973 and 1996 appears to be small, since the level of income inequality: remains fairly constant at different points in time for the same age groups (i.e., Table 2 read diagonally); decreases in old age at different points in time (i.e., Table 2 read down); and follows a similar pattern with age for different birth cohorts (i.e., Table 2 read across). Changes in the level of income inequality for cohorts entering old age prior to the 1980s, however, are likely much different. This is because the three cohorts observed in Table 2 have all benefited from the growth in public and private pension systems.

### AN ILLUSTRATION OF INCOME DISTRIBUTION WITH QUINTILES

The degree of inequality in an income distribution has been expressed as a single, numeric value; however, income inequality can also be depicted by an income quintile distribution. By comparing income quintiles for different years, it is possible to see how shares of income have changed between income groups.

The most obvious finding in Table 3 is the small proportion of total income in the bottom quintile (i.e., those with the lowest 20% of incomes) – for example, their share of all incomes is just 6.4% at ages 60 to 64. By the time cohort family heads reach retirement age, however, the bottom quintile's share of income increases to 9.7% at ages 65 to 69 and 10.3% at ages 70 to 74. The relative situation of the second quintile also improves in old age (from 11.5% at ages 60-64 to 13.1% at ages 70-74). These increases in income shares for the bottom two quintiles come mainly at the expense of the top quintile (i.e., those with the highest 20% of incomes), who in 1996 possesses 39.0% of all incomes compared to 42.2% in 1986. These numbers suggest that old-age public pension policy in Canada does redistribute income to the poorest families.

Table 3 about here

### AVERAGE INCOME AND THE LATER LIFE COURSE

Since income quintiles provide a relative measure of inequality, an increase in relative income shares of those in the bottom quintiles does not necessarily mean that their absolute incomes have improved. Table 4 shows income in absolute terms (i.e., median

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family income in 1996 dollars) for each quintile from 1973 to 1996.

The most notable trend in this table is the growth of median real income for those in the bottom quintile of the income distribution in old age. Between 1986 and 1991, median adjusted income of families in this quintile increases from $8,900 to $12,363 (or by 40%). This improvement reflects the fact that public pension benefits in Canada are not strongly tied to employment history. Hence, the public pension system is particularly generous to those at or near the bottom of the income distribution. Further, Canada has relatively high minimum public pension benefit levels; thus, Canadians in the lowest quintile just prior to retirement tend to experience no drop in their income upon retirement.

Table 4 about here

On the other hand, the median adjusted family income of the middle and fourth income quintiles decreases from $21,485 and $30,044 at ages 60-64, respectively, to $19,479 and $26,608 at ages 65-69. While old age reduces the standard of living of middle- and upper middle-income families, it is not significant - median income is reduced by only about 10% for both quintiles. This would suggest that the retirement income system is able to maintain, on average, a "reasonable" relationship between income before and after retirement for middle class Canadian families. While those in the top income quintile have considerably higher adjusted incomes both before and after retirement, there is a similar reduction in their standard of living in old age; median income decreases from $46,373 in 1986 to $41,834 in 1991 (or by about 10%).

### SOURCES OF INCOME IN LATER LIFE

The data here show strong support for the hypothesis that inequality in income narrows in old age. The rising tide/transfer redistribution model also assumes that this decline is the result of increased reliance on state benefits, which are largely redistributive, among seniors. This assumption is tested by analyzing the breakdown of public and private sources of family income in old age by income quintiles.

Table 5 shows the percentage of income that the bottom and top income quintiles (and all cases combined) receive from OAS/GIS, C/QPP, investments, private pensions, earnings, and other sources when cohort family heads are aged 70-74 (i.e., in 1996). These data support the assumption that seniors rely heavily on income from government transfer payments. OAS/GIS benefits alone constitute over one-quarter (25.2%) of family income. Further, there is a weighty reliance on government benefits for those in the bottom income quintile; public sources (OAS/GIS and C/QPP) form almost 90% of their income.

Table 5 about here

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Public sources of income make up a large percentage of seniors' overall income because they are less discriminating (i.e., based less on pre-retirement socio-economic status) than private ones. In fact, while the top income quintile has a mean adjusted income (before taxes) of $56,780 compared to a mean adjusted income of only $12,288 for the bottom income quintile in 1996, the latter group receives $160 for each $100 received by the former group from OAS/GIS (i.e., $8,671/$5,542). The income-testing component built into the OAS/GIS program produces this equalizing effect. In terms of the C/QPP, the bottom quintile receives about $40 for every $100 received by the top quintile. Private sources of retirement income are distributed much less equally. The bottom quintile receives only a few dollars for every one hundred dollars received by the top quintile from investments, private pensions, and earnings.

*DISTRIBUTIONAL IMPLICATIONS OF PUBLIC PENSION POLICIES: AN INTERNATIONAL PERSPECTIVE*

The results in the previous sections show that the distribution of income becomes more equal in old age relative to the years just before age 65. The primary reason for this is that public pension benefits in Canada become more important than labour market income, and the former are more equally distributed than the latter. This section looks at how government policy in Canada fairs in reducing old-age income inequality compared to other industrialized, Western nations (i.e., U.S., U.K., and Sweden).

Table 6 shows the distribution of net (post-tax/post-transfer) family income to quintiles of family heads aged 65+, along with the Gini coefficient for each distribution.[19] The differences across countries exist primarily in the top and bottom income quintiles. Sweden has the largest bottom quintile - 12.3% - but just slightly higher than the bottom quintile share in Canada (11.7%). The second and third bottom quintiles in Sweden, however, receive a relatively higher income share than they do in Canada. As a result, Sweden has the lowest income share in the top quintile. This more equal distribution of income is reflected in Sweden's moderately lower Gini coefficient (.191) compared to Canada (.240). By contrast, the U.S. has the lowest share in the bottom quintile compared to the other countries, and the highest percentage in the top quintile. This is reflected in its relatively high Gini (.372). The rate of old-age income inequality in the U.K. (.287) is moderately higher than the Canadian rate, but significantly lower than the U.S. one.

Table 6 about here

While the Canadian retirement income system is structurally similar to the U.K. and U.S. systems, there are many differences in the levels and generosity (especially to lower income persons) of public pension benefits. Wolfson and Murphy (1994), for instance, show that while the average income of seniors is considerably higher in the U.S. compared to Canada, Canadian seniors receive a higher average and proportion of income

from public sources than U.S. seniors.

More income from public sources in Canada is clearly explained by higher levels of public pension benefits, which includes the nearly-universal OAS pension benefit. By way of illustration, in 1988, the maximum public pension (in Canadian dollars) for married couples aged 65+ in the U.S. was about $19,300 (Wolfson and Murphy 1994), compared to approximately $21,500 in Canada (National Council of Welfare 1989). In addition, unlike the public pension system in the U.S. that is significantly tied to employment history (excluding the Supplemental Security Income program), only a part of public pension benefits in Canada (i.e., C/QPP) are based on pre-retirement earnings. Hence, the public pension system in Canada is particularly generous to those at or near the bottom of the income distribution. In fact, the minimum income received from public pension sources by the poorest segment of the elderly population (i.e., unattached individuals with little or no income from earnings-related public or private pensions or savings) was $3,000 higher in Canada compared to the U.S. in 1988 (Wolfson and Murphy 1994).

Given that Canada has a more generous and progressive public pension system, which seniors rely quite extensively on, those in the lowest quintiles of the income distribution just prior to retirement tend to experience no drop in their income at age 65; as shown earlier, it actually increases. Their improved position relative to those at higher income levels contributes to a reduced rate of income inequality in old age.

The reverse trend occurs in the U.S. Studies, using similar measures of economic well-being as those used here, find that the level of income inequality within a cohort increases over the later stages of the life course. Pampel and Hardy (1994a) show that level of inequality in family income (measured by the Theil index) is more than twice as high at ages 70-74 compared to ages 45-49. Crystal and Waehrer (1996) and Crystal and Shea (1990a) show that the Gini coefficient of income inequality steadily increases within a cohort as it leaves the working years and enters the retirement years.

These data suggest that any equalizing impact of government transfers in the U.S. is outweighed by the grossly skewed distributions of earnings and pension/investment income in later life. In fact, LIS data show that aggregate government transfers are only about 44% of gross total income of the 65+ population in the U.S., compared to 72% in Sweden and 54% in Canada.[20] In other words, for every $100 of income received by Swedish seniors, $72 comes from public pensions; while Canadian seniors receive $54 out of every $100 from public sources, U.S. seniors receive just $44. Moreover, while Social Security benefits are based on a somewhat progressive formula, low pensions are received by those with low pre-retirement earnings (Wolfson and Murphy 1994). The relatively high rate of old-age income inequality in the U.S. therefore stems from the importance placed on private pensions/investments and earnings (which are strongly tied to, for example, education, race, and gender (Crystal 1996; Crystal, Shea, and Krishnaswami 1992)) and the corresponding low levels of government transfers.[21]

*Discussion*


Two opposing ideological viewpoints were, and still are, central to the development and revision of pension policy and programs (Guest 1997). First, the "residual" view holds that individuals, through private pension plans and personal investments, and their families should be responsible for providing for their old age. The role of the state is to be limited to the confines of the needy. This market-driven concept of residual welfare was important in shaping public pension policy and programs up to World War II. The opposing view holds that a commitment to collective responsibility, in the form of a comprehensive welfare state, is needed to ensure social and economic well-being. This "institutional" concept of welfare played a central role in molding the post-World War II welfare state.

The residual concept is again playing a significant part in shaping today's old-age welfare states (Myles and Street 1995). Population aging, fiscal constraints, and generational equity are often sited by neo-conservatives as reasons for re-examining (i.e., reducing) commitment to collective responsibility for the aged. This laissez-faire ideology is a connecting thread running through most social policy reforms in industrial nations. Even Scandinavian countries, with highly developed and generous welfare states, have been influenced by right-wing thinking (Townson 1994).

This study has demonstrated the importance of universal and high minimum-level public pension benefits for leveling old-age income inequality. Cohorts entering old age today in Canada experience a drop in the overall level of income inequality partly because of the relative importance placed on public pensions, which are distributed more equally than labour income. A few decades ago, when Canada's public pension system was just taking shape and earnings and other private income were the main sources of economic well-being for seniors, the level of income inequality likely did not drop at age 65. A reduction in the state's involvement in social security (i.e., returning social programs to a social assistance function for those most in need, while encouraging market place solutions for income security and maintenance) would likely lead to an increase in rates of poverty and income inequality among future generations of Canadian seniors.[22] A large role for the state in providing for seniors is therefore essential to maintaining economic well-being and stability among lower and middle class persons, and equalizing the distribution of income in old age.

## TABLE 1
Gini Coefficients of Family Income Inequality, 1973 to 1996: Family Heads born between 1922 and 1926

|  | Year | | | | |
|---|---|---|---|---|---|
|  | 1973 | 1981 | 1986 | 1991 | 1996 |
| *Age* | *47-51* | *55-59* | *60-64* | *65-69* | *70-74* |
| Gini[a] | .321 | .350 | .385 | .312 | .303 |
| Gini[b] | .300 | .317 | .348 | .254 | .244 |
| Gini[c] | .297 | .318 | .360 | .305 | .286 |
| n | 2,301 | 2,910 | 2,199 | 2,809 | 1,914 |

a. Coefficients are based on after-tax family income (i.e., no adjustments were made to the data).
b. Coefficients are based on after-tax family income adjusted for family size only.
c. Coefficients are based on after-tax family income adjusted for family size and underreporting of income components.
Source: Survey of Consumer Finances, 1973-1996, Economic Family files.


## TABLE 2
Gini Coefficients of Adjusted[a] Family Income Inequality, 1973 to 1996: Family Heads by Cohort, Year, and Age

| | Year | | | | |
|---|---|---|---|---|---|
| *Cohort* | *1973* | *1981* | *1986* | *1991* | *1996* |
| *1917-1921* | | | | | |
| Age | *52-56* | *60-64* | *65-69* | *70-74* | *75-79* |
| Gini | .319 | .354 | .316 | .308 | .293 |
| *1922-1926* | | | | | |
| Age | *47-51* | *55-59* | *60-64* | *65-69* | *70-74* |
| Gini | .297 | .318 | .360 | .305 | .286 |
| *1927-1931* | | | | | |
| Age | *42-46* | *50-54* | *55-59* | *60-64* | *65-69* |
| Gini | .292 | .306 | .338 | .364 | .282 |

a. Coefficients are based on after-tax family income adjusted for family size and underreporting of income components.
Source: Survey of Consumer Finances, 1973-1996, Economic Family files.

TABLE 3

Percentage Distribution of Adjusted[a] Family Income by Income Quintiles, 1973 to 1996: Family Heads born between 1922 and 1926

| | | | Year | | |
|---|---|---|---|---|---|
| Quintile | 1973 | 1981 | 1986 | 1991 | 1996 |
| Age | 47-51 | 55-59 | 60-64 | 65-69 | 70-74 |
| Bottom | 7.0% | 6.8% | 6.4% | 9.7% | 10.3% |
| Second | 13.6 | 12.7 | 11.5 | 12.4 | 13.1 |
| Middle | 18.7 | 17.9 | 16.6 | 15.9 | 16.0 |
| Fourth | 24.2 | 24.3 | 23.3 | 21.7 | 21.6 |
| Top | 36.5[b] | 38.3 | 42.2 | 40.3 | 39.0 |

a. Distributions are based on after-tax family income adjusted for family size and underreporting of income components.
b. May not total exactly to 100% due to rounding.

Source: Survey of Consumer Finances, 1973-1996, Economic Family files.


TABLE 4

Adjusted[a] Median Family Income (in 1996 dollars)[b] by Income Quintiles, 1973 to 1996: Family Heads born between 1922 and 1926

| | | | Year | | |
|---|---|---|---|---|---|
| Quintile | 1973 | 1981 | 1986 | 1991 | 1996 |
| Age | 47-51 | 55-59 | 60-64 | 65-69 | 70-74 |
| Bottom | $8,740 | $10,298 | $8,900 | $12,363 | $12,442 |
| Second | 16,172 | 17,785 | 14,582 | 15,205 | 15,445 |
| Middle | 21,770 | 24,874 | 21,485 | 19,479 | 18,680 |
| Fourth | 28,279 | 33,641 | 30,044 | 26,608 | 25,195 |
| Top | 38,730 | 47,925 | 46,373 | 41,834 | 39,111 |

a. Medians are based on after-tax family income adjusted for family size and underreporting of income components.
b. Dollar figures were adjusted for inflation using Statistics Canada's Consumer Price Index.

Source: Survey of Consumer Finances, 1973-1996, Economic Family files.

TABLE 5

Percentage Distribution of Adjusted[a] Family Income within Top and Bottom Income
Quintiles, by Source of Income, 1996: Family Heads born between 1922 and 1926

| | Quintile | | | | | |
|---|---|---|---|---|---|---|
| Source | Bottom | | Top | | All Cases | |
| OAS/GIS[b] | 70.6% | ($8,671)[c] | 9.8% | ($5,542) | 25.2% | ($6,733) |
| C/QPP | 19.0 | (2,332) | 11.1 | (6,280) | 18.6 | (4,976) |
| Investment | 1.0 | (124) | 33.9 | (19,230) | 20.0 | (5,334) |
| Private Pension | 2.6 | (324) | 26.7 | (15,136) | 21.8 | (5,824) |
| Earnings | 0.4 | (54) | 14.6 | (8,279) | 9.1 | (2,417) |
| Other Income[d] | 6.4 | (783) | 4.1 | (2,313) | 5.3 | (1,422) |
| Total[e] | 100.0 | (12,288) | 100.0 | (56,780) | 100.0 | (26,706) |

a. Distributions are based on before-tax family income adjusted for family size and
   underreporting of income components.
b. Includes spousal and provincial income supplement programs, which aim to assist the
   poorest elderly.
c. Mean incomes are in brackets.
d. Other income is that from other government and private sources.
e. May not total exactly to 100% due to rounding.
Source: Survey of Consumer Finances, 1996, Economic Family files.


TABLE 6

Percentage Distribution of Adjusted[a] Family Income by Income Quintiles and Gini
Coefficients, for Selected Countries,[b] Family Heads Aged 65+

| | Country | | | |
|---|---|---|---|---|
| Quintile | Canada | U.S. | U.K. | Sweden |
| Bottom | 11.7% | 6.5% | 10.1% | 12.3% |
| Second | 14.3 | 11.2 | 13.5 | 16.2 |
| Middle | 16.6 | 15.8 | 15.6 | 18.5 |
| Fourth | 21.6 | 22.6 | 21.0 | 21.1 |
| Top | 35.9[c] | 43.9 | 39.5 | 31.8 |
| Gini | .240 | .372 | .287 | .191 |

a. Distributions/coefficients are based on after-tax family income adjusted for family size.
b. The following LIS datasets were used: Canada, 1994; U.S., 1994; U.K., 1995; and
   Sweden, 1995.
c. May not total exactly to 100% due to rounding.
Source: Luxembourg Income Study, Family files.

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[1]All individuals 65+ who meet a residence requirement automatically receive an OAS pension. However, higher income pensioners repay part or all of their benefit through a "claw-back" introduced in 1989. OAS pension payments start dropping when an individual's income tops around $55,000 and seniors with net incomes of about $85,000 receive no OAS pension benefits.

[2]Following most studies on economic well-being in later life, persons aged 65+ (the normal age of eligibility for retirement benefits) are used as a proxy for the retired population.

[3]Because the SCF covers only private households, the aged are not as well represented as other age groups in this study (i.e., a higher percentage of them reside in institutions).

[4]Given that the SCF is available from 1973 onward, this cohort is selected since it crosses both the middle and later stages of the life course.

[5]It is possible to compare SCF data from different years since the sampling procedure used in all SCF surveys is the same.

[6]It is important to point out that the same set of individuals is not examined at each point in time. Rather, the data at each point in time are based on a different random sample of individuals born between 1922 and 1926. Hence, snapshot data for one year at a time are essentially used as proxies for lifetime income statistics. This pseudo-panel data is a reasonable substitute for genuine panel data, and indeed may produce more reliable estimates than longitudinal data; that is, using a series of random samples from the same cohort eliminates the problems caused by attrition in real panels (Browning, Deaton, and Irish 1985).

[7]Four countries are selected for analysis: Canada, United States, United Kingdom, and Sweden. Canada, U.S., and U.K. are chosen because they represent "liberal" welfare states where market income plays a large role in the economic well-being of the aged, while Sweden is the epitome of the "social democratic" model based on comprehensive, universalistic, and generous income maintenance programs (Esping-Andersen 1990).

[8]Since there is more inequality in wealth than in income (Osberg 1981), and given the cumulative nature of wealth, the dispersion in the distribution of economic well-being over the life course would likely be greater with the inclusion of wealth in the analysis. However, using a combined annual cash income/wealth estimate of economic well-being, analysis of age groups from the 1984 SCF wealth survey reveals a similar pattern of changes in inequality rates over the later life course to those observed in this paper. Hence, annual money income can be used as a proxy of economic well-being with a relatively high level of confidence (i.e., in testing the three models of economic well-being and the life course).

[9]While family income rather than personal income is a more appropriate measure, it is difficult to analyze the actual economic position of each individual within a family. Personal income data are therefore also used to separate individual income from the income of other family members, and to supplement the main family income findings.

[10]A more inclusive approach would be to use the person as the unit of analysis, while

utilizing family income as the income measure. This approach (i.e., focusing on family income of persons) has the advantage of being more representative because it would include, for example, the aged living in non-elderly headed families (Crystal 1996). However, similar to other Canadian income datasets, the SCF only permits analysis of family income of family heads.

[11]Prior to 1981 Statistics Canada made adjustments for non-response through weighting, and not imputation.

[12]Another challenge to this research is age-specific socio-economic differences in mortality and morbidity. Since persons of lower income are more likely to die at earlier ages (Mustard et al. 1997), it is possible that longitudinal studies inflate income levels in later life. However, Prus (1998) finds that when compensating for the selective effects of mortality levels measures of economic well-being (i.e., income inequality), even in old age, do not dramatically change. Also, Henretta and Campbell (1976) find that after re-weighting income data for the effects of education differences in mortality estimates of post-retirement income change very little. Therefore, the data here are not adjusted for age-specific socio-economic differences in mortality.

[13]Like G, the CV satisfies all "desirable" conditions of a robust measure of inequality (Love and Wolfson 1976).

[14]In a hypothetical, infinite population, a maximum G of one is possible. In a limited population, however, the maximum G is equal to N-1/N.

[15]The Gini coefficients in each row in Table 1 are based on either unadjusted or adjusted income. The most noticeable change between income measures occurs after the data are adjusted for family size. For example, in 1991, when all cohort heads were at least 65+, the Gini index for the unadjusted distribution of family income is .312. However, after an adjustment is made for family size, this index falls to .254. The effect of adjusting for family size in old age is significant because many elderly-headed families (about 50%) consist of an unattached individual. Adjustments for underreporting of income also influence the Gini index, notably in old age. Looking again at the 1991 figures, the ratio increases from .254 (second row of Ginis) to .305 (third row). This increase is the result of the inflation of investment income, which is the largest source of income for the wealthiest seniors. Given that these adjustments have substantial effect on estimates of income inequality, the rest of the analysis is based on data adjusted for family size and underreporting.

[16]To gauge the impact of gender and ethnicity/race on income inequality, separate inequality analyses for male- vs. female-family heads and Canadian-born vs. foreign-born family heads were done. Consistent with the findings in Table 1, the rate of income inequality decreases for all four groups in old age. Generally speaking, the results for both Canadian- and foreign-born cohorts are almost identical to the Gini ratios obtained for the entire cohort. There is, however, somewhat less income inequality among male-headed families compared to their female counterparts during the traditional working years (i.e., up to age 60), indicating that gender plays a role in the overall level of inequality. This would suggest that while some families headed by women are able to overcome income barriers, most are not. In old age, however, this trend is reversed; inequality is

considerably higher among male-headed families. This is largely because public pension programs, and not the labour market, become a key source of retirement income for female headed families, while disparities in private sources of income are more common among families headed by older men.

[17]The validity of these findings is confirmed by coefficients of variation (CV). They indicate the same pattern in inequality from 1973 to 1996; that is, inequality increases up to age 64 then continues to fall in old age. For example, the CV, based on family income adjusted for family size and underreporting, decreases from .438 in 1986 (when cohort heads are aged 60-64) to .416 in 1991 (ages 65-69). The CV decreases even further to .393 in 1996.

[18]The results of a cohort analysis with personal income for all individuals born between 1922 and 1926 also mirrors these findings - there is a positive then negative association between level of income inequality from mid- to late-life. The Gini coefficients for adjusted (i.e., for underreporting) personal income between 1981 to 1996 (SCF personal income files are only available from 1981 onward) are: .349 in 1981 (i.e., for persons aged 55-59), .385 in 1986 (60-64), .361 in 1991 (65-69), and .348 in 1996 (70-74). These figures are only for individuals who reported an income greater than zero in these years. The level of inequality in personal income is in fact considerably higher in 1981 and 1986 when all cases are included because of the significant number of persons with no income (e.g., the chronically unemployed and married women not working in the paid labour force).

[19]Adjustments to LIS income data for underreporting are not made because of the lack of independent aggregate estimates of income sources from some of the countries analyzed here; adjustments are made for family size by dividing total family income by the square root of family size.

[20]Government transfers include basic old age benefits, supplementary old age benefits, and survivor's pensions. Total gross income is government transfers plus private pension and factor (earnings, dividends, interest, etc) income, before taxes.

[21]It is important to note that besides a country's public pension policies, other factors, such as the taxation system, also influence the magnitude of income inequality among seniors (Myles 1981).

[22]Indeed, Murphy and Wolfson (1991) show that over the next 50 years the OAS claw-back (see endnote 1) will result in more and more middle class persons slipping into poverty. Specifically, while all public pension programs are fully indexed to the cost of living, the OAS claw-back ceilings are not. Consequently, more and more seniors will be subject to the claw-back each year. The claw-back at first affects only seniors who are financially well-off, but in the future will extend to middle and lower income seniors.

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