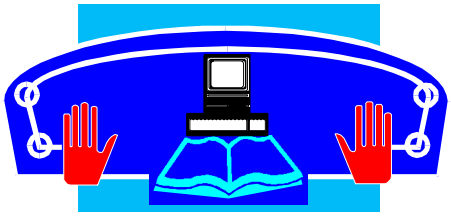

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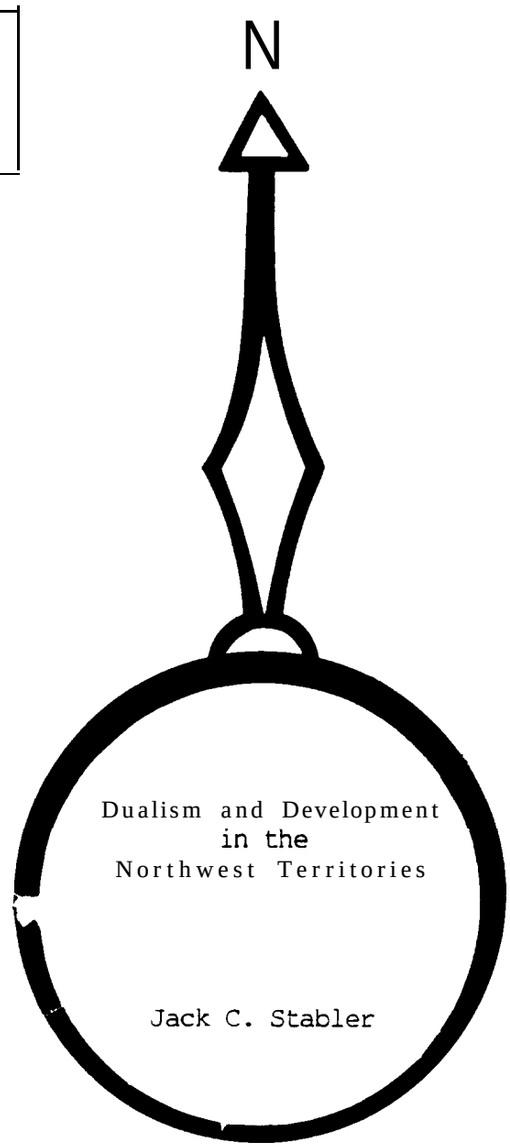

Dualism and Development in the Northwest Territories

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Lakehead Centre
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DUALISM AND DEVELOPMENT IN THE NORTHWEST TERRITORIES

by

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Introduction

With the rapid extension of modern commercial, industrial and government systems into Canada's northern territories during the past three decades, a debate has grown over whether this development has been economically beneficial for the aboriginal people living there.[2] Although a portion of this debate has been completely unstructured, the existence of technologically advanced extractive, processing, service and administrative activities alongside the traditional hunting, fishing and trapping economy has resulted in frequent reference to the dual economy paradigm as a framework within which to advance an argument.[3] Unfortunately, lack of empirical data on activity patterns by ethnicity has been a perpetual problem. Analyses based on factual information have, therefore, either been restricted to a limited number of variables when based on census or Indian and Northern Affairs data, or more inclusive, but limited to a region or an area, when data are collected specifically for an impact study or a socio-economic analysis of a local native economy.'

Recently, however, under the direction of the Northwest Territories Bureau of Statistics, detailed interviews were conducted with 11,164 people between 15 and 64 years (36 percent of the territorial population between these ages). Although inquiries were not made about incomes, responses were obtained to several questions regarding such socio-economic variables as location, ethnicity, education, willingness to relocate and labor force activity (including participation in traditional activities).5

Information compiled from the interviews, coupled with previously unpublished income statistics from the decennial census, provides the empirical basis for the analysis reported in this paper. This substantial body of data makes it possible to investigate several major teneta of the dualism hypotheses covering a period when the modern economy expanded rapidly into an extensive geographic area characterized initially by almost total dependence on traditional activities.

Background

Pre 1950

The closed, self-sufficient economies first observed by Europeans in the eighteenth century were only gradually modified by the establishment of the fur trade. Native people traded food and furs for a limited selection of gooda which made life easier but were not absolutely essential. This activity, therefore, did not lead at the outset to radical changes in the internal means of production and distribution.[6]

It was not until approximately 1900 that the barter system gave way to the widespread use of money which, coupled with the growing availability *of* a greater variety of manufactured goods, began to create a pervasive, on-going, dependence on the modern economy.[7] Even so, relative stability in the terms of trade between furs and manufactured goods until after World War Two permitted continued participation in the traditional economy by the majority of native people into the 1950s. During this interval, native people lived in small semi-nomadic groupa and were self-sufficient with respect to shelter and, perhaps, threequarters or more of their food requirements. Equipment, household durables, some clothing, some foodstuffs and a few luxuries were purehaaed with proceeds from fur sales. Few natives attended school, few worked in the small commercial outposts of the modern economy and virtually none migrated to southern Canada.[8]

Poet 1950

Fur prices declined after World War Two while prices of manufactured gooda rose rapidly. By the mid- 1950s, it appeared that the terms of trade had shifted permanently against furs and that some other means would have to be found to support at least a portion of the population of the Northwest Territories (NWT). In January, 1956, the Territorial Council unanimously passed a resolution stating, in part:

> whereas the real income derived from fur trapping in the Northwest Territories is

less than one-third of its pre-war level . . . and whereas it is not possible for a person to live and to provide the minimum needs of his family at the present prices Of fur . . . [be it resolved that] the Commissioner be requested to ask the Minister of Northern Affairs and Natural Resources to request the Government of Canada most strongly to give immediate consideration to the provision of assistance to the people of the Northwest Territories through the establishment of an appropriate measure of support for the price of fur; or, alternatively, to take all possible measures at the earliest date to stimulate the economic development of the Northwest Territories so that alternative means of employment and income can be provided for these people.[9]

Development was the option chosen, and universal education was seen as a necessity in preparing native people for the jobs this approach was expected to eventually provide. An important consequence of the education program was resettlement. Native people were encouraged to move permanently into communities where schools and housing were being built 10 Income was maintained through universal programs such as family allowance payments and old age security pensions, some extension of wage employment, an increase in welfare payments and continued participation in traditional activities. [11]

From the late 1950s onward the federal government led the attempt to create a modern economy in the NWT. Transportation systems were extended and improved, other infrastructure was added or upgraded in selected locations and a modem city was built at Yellowknife to serve as the administrative capital. Private companies were encouraged to search for and exploit the region's natural resources, usually with government assistance in both exploration and development.[12]

The economy of the NWT has grown rapidly since the end of the 1950s. Total population doubled between 1960 and 1980, partly through in-migration of non-natives, and employment more than doubled.

The occupational and geographical shifts which occur during the process of development are seldom accomplished with tranquility, however, even within a uni-cultural society. The process is typically more traumatic when distinctly different cultures are involved. The experience in the NWT was no exception. The transition from hunter to worker, particularly in the early yeara, was frequently characterized by frustration, anxiety and disappointment for both potential employees and their families as well as for potential employers. At the same time the long-term prospects for earning a living in the traditional sector continued to decline, although intermittent periods of good yields and high prices periodically interrupted the cost-price squeeze produced by continuously rising input costs, erratic prices for furs and shrinking markets occasioned by adverse publicity concerning harvesting techniques.

While certain aspects or selective periods of this expansion are adequately documented, *only* fragmentary information is available on the extent of native involvement in the traditional economy or the growing native participation in the modern economy. It was only with the 1981 census and, in particular, the 1984 survey, that information on activity patterns by ethnicity was obtained on a sufficiently comprehensive basis to permit systematic analysis of the dualism paradigms.

The Concepts of Dualism

A number of concepts, used separately or in combination, characterize the loosely connected streams of thought that comprise the literature on economic dualism.

Theoretical developments have been concerned either with the *dual economy, which* focuses *on* differences between industries, *or* with the *dual labor market,* which is concerned wit h labor market segmentation, a phenomenon which has been largely attributed to factors other than industrial structure.

The Dual *Economy*

In the dual economy literature, which is concerned primarily with developing nations, the central tenet is the existence of two sectors: one modern, the other traditional. The distinction is based largely on methods of production. The modern sector is characterized by the use and continuous adoption of advanced technology, growth of productivity and rising per capita output. The traditional sector, on the other hand, is typically labor intensive and is characterized by the use of an inferior technology, a slow rate of adoption of advanced techniques and little or no productivity growth. Incomes are much higher for those employed in the modem *sector* and there is little or no evidence of convergence. Formal education is largely irrelevant for those engaged in traditional activities.

A second postulate is *that* the modem and traditional sectors interact to only a limited extent. Interindustry *linkages, in* particular, are minimal. The existence of a modern sector, therefore, does little to diminish or eliminate the technological and productivity differences between itself and the traditional sect-m. Some writers in this area go further, contending that expansion *of* the modern economy explicitly imposes costs on the traditional sector either by creating environmental damage, social disruption, or both. [13]

Third, it is argued, in the typical developing country the growth of iob opportunities in the modern sector is insufficient to absorb all of the natural increase in the labor force.

Thus a queue is formed consisting of a growing absolute number of unemployed as well as those attempting to leave traditional activities.[14]

The Dual Labor Market

The dual labor market paradigm is usually discussed in the context of developed economies where it has been advanced as an alternative to the neo-classical (human capital) approach. Proponents of this model identify two types of jobs. Primary jobs are characterised by high wages, favorable working conditions and opportunities for advancement. Secondary jobs are characterized by low wages, unfavorable working conditions, unstable employment and limited opportunities for advancement. Positive returns to both education and experience characterize primary sector employment whereas returns to both are low or negligible in secondary jobs. Jobs of each type may simultaneously exist in the same industrial sectors. Advocates of the dual labor market paradigm argue that primary jobs are limited and, as in the dual economy approach, that a queue exists in which people wait for a chance to obtain a preferred job. Dual labor market theorists argue that, since primary jobs are limited, they are rationed. Consequently, employers may utilize discriminatory hiring policies based on either non-economic grounds, such as ethnicity or sex, or on perceived economic grounds such as the alleged poor work habits developed in secondary jobs.[15]

Objectives of the Study

The data recently generated for the NWT permit an investigation of selected aspects of both the dual economy and the dual labor market paradigms. Such an analysis, however, required generalization and consequently abstraction from particular experiences, regional variations and differences between specific traditional pursuits engaged in by the Dene compared with the Inuit. While such fine-grained detail is of considerable interest, and in certain instances could be at variance with overall trends reported here, a substantial body of case studies exists which provides particulars necessarily omitted from this paper.[16]

In the analysis which follows, therefore, an attempt is made to determine, at the territorial level, the extent to which people continue to participate in the traditional *sector* and to ascertain whether there is a queue in which people wait for a job in the modern economy. This is followed by an identification of the types of jobs available in the modem sector and an analysis of the characteristics of employees holding them. Specifically, an

attempt is made to determine, fret, whether the occupational distribution reflects the systematic influence of selected non-economic factors; second, if it does, whether returna to education or experience are negligible for those who are the subject of the discrimination; and third, whether a queue ● xists for primary jobs.

The Dual Economy in the NWT

The hunting-fishing-trapping economy which existed in the NWT at the *time* the modern sector began ita rapid expansion was characterized by many of the attributes conventionally used to classify traditional economies in the Third World. In other respects, however, conditions in the NWT were, and remain, atypical of those found in most Third World countries. Population density, for ● xample, ia very low and the absolute population ia small. A second important difference is that the (nation's) resources available to *effect* development in the NWT are far greater on a per capita basis than is typically' the case for developing countries. Third, a system of social insurance programs such as family allowances, old age pensions, unemployment benefits and welfare payments provide supplements to earnings and, thus, assist in maintaining incomes at a fairly high level. In 1980, for example, the per capita income of native people 15 years and older was $6,059 (U.S.), although price levels considerably above those in southern Canada reduce this figure in real terms.17 Fourth, migration to major urban centers characteristic of Third World nations has, thus far, not occurred in the NWT, possibly because of the income supplements which permit people to maintain a livelihood virtually any place they choose. Finally, the NWT is a territorial unit within the Canadian polity and is technically administered by the federal government although residents enjoy, de facto, political and adminiatrative powers over day-to-day affairs similar to those of the provinces.[18] Circumstances have thus favored a more rapid pace of development in the NWT than in many Third World countries. It is possible that the changes which have occurred in the NWT during the past three decades would have required several generations in the Third World.

The Traditional Sector

Traditional pursuits include a group of renewable resource harvesting activities, each of which is seasonal and depends upon different skills and methods of production, although some of the equipment *may* be used in more than one activity. A participant in all of the tradition pursuits will be occupied on a more-or-leas year-round basis except for

approximately six weeks during the middle of the winter when it is too cold and dark to be outside for prolonged periods.

The majority of native people in the NWT were engaged in traditional pursuits on a year-round basis into the 1950s. Today, however, traditional pursuits provide a year-round occupation for only about one thousand native males between the ages of 15 and 64, 15 percent of all native males in these age groups. This comparison understatea the overall involvement in traditional activities, however, since it is quite possible to limit oneself, with little 10ss of efficiency, to only *one* or two seasonal pursuits.

The summary statistics in Table 1 indicate that only a small number of native males participate in traditional activities year-round, while a much larger number do so on a part-time baais. The only sizeable involvement for female nativea is of a part-time nature; non-native participation is negligible. The statistics in Table 1 also indicate that older males are much more likely to engage in traditional activities than younger males. Year-round participation of males aged 45-64 is nearly twice as great as that of 15-24 year-olds (20 percent of the former group compared with 11 percent of the latter), and 33 percent greater than that of males between 25 and 44, 15 percent of whom are engaged year-round.

Male participants in the traditional economy are further distinguished, in terms of educational achievement, from those who do not participate. Non-participants have, as a weighted average, 62 percent more years of formal education than full-time participants, and between 15 and 25 percent more than those engaged in traditional "activities on a part-time basis.

Finally, the traditional economy appears singularly unattractive as an exclusive occupation. For all participants who are not employed, the number wanting a job in the modern sector exceeds those who do not by nearly 8 to 1. Even for people engaged year-round, those wanting jobs outnumber those who do not by 3.7 to 1. For males engaged year-round the ratio is 4.6 to 1.

In some respects, however, the traditional sector in the NWT, and participation in it, appears to differ from that predicted by the dual economy paradigm. To begin with, 36 percent of NWT natives engaged in traditional pursuits also hold jobs in the modern sector, a proportion which appears larger than what is either implied in the theory of dual economies or revealed in a review of the empirical literature. Further, many native people use the income received as transfer payments *or* ● arned from jobs in the modem sector to

purchase the equipment required to participate. in traditional activities.[19] Consequently, the traditional sector in the NWT is characterized not by the use of a technology that is inferior, but rather *a* technology that is advanced and sophisticated. Nevertheless, interindustry linkages are, as predicted, very limited.[20]

Case studies indicate that except for a few notable exceptions, the *income* plus income-in-kind gained from traditional activities produces only *a* small surplus over the required outlay s.21 Since entry into hunting and fishing is generally not restricted and is only partially restricted into trapping, it would appear that over-participation haa pushed marginal productivity in this sector to a very low level.22 Many continue to participate in the (frequently unrealized) anticipation of earning some extra income, because the wild harvest provides a preferred diet, because it is a form of recreation which perpetuatea a cultural heritage[23] or, perhaps, because it is preferable to being idle. The extent and tenacity of this participation, however, implies that many nativea derive more satisfaction from practicing tradition skills than from *a career es* clerk, equipment operator or administrator. In some respects the situation is similar to that of North *American* farmers forced out of agriculture during the paat several decades. Many would have preferred to stay but eventually came to the reluctant conclusion that it was economically necessary to seek employment in other sectors of the economy.

Participation in tradition activities was 30 percent higher among those not working but wanting a job than for people employed in the modem sector. This, coupled with the fact that 82 percent of the participants who were not working wanted *jobs,* suggests that, in terms of providing a livelihood, engagement in traditional pursuits is an inferior substitute for full time employment.[24]

The null hypothesis, that the age-activity distributiona of male natives engaged in traditional pursuits and those who were not, are equal (i.e., drawn from the same universe), was teated using the Chi-square technique. In ● ach of the four possible comparisons the null hypothesis was rejected at the 0.01 level. A second null hypothesis, that the mean level of formal ● ducation for those not involved in traditional pursuits- is the same as for those who are, was then teated using a t-teat with the separate variance estimate formula. This hypothesis was dao rejected at the 0.01 level in each instance.2S The statistics for these and for later hypothesis teats are grouped together in the appendix.

The Modern Sector

The industrial structure of the modem component of the NWT economy resembles that of other northern frontier regions such as those found in Alaska. or the Yukon. As shown in **Table** 2, a relatively greater proportion of the labor force in frontier regions is employed in **extractive** industries, by governments, and in transportation than is typical of more mature economies, while agriculture and manufacturing are underrepresented. Employment in the combined trade, finance, and service industries is distributed in approximate equality with population, as is typical of regional economies in **developed** countries,

On the **basis** of the swey taken in the NWT in 1984 it was inferred that **17,775** people were employed in the modern economy: 11,643 non-natives and 6,132 natives. These statistics are recorded in Table 3. By the conventional definition, participation rates were 84 and 54 percent for non-natives and natives respectively. Conventional labor force definitions, however, are in some respects inappropriate in a frontier context. The unemployed category, for example, includes **only** those people not working who **were actively** looking for work during the four weeks prior to the survey. In virtually **all** communities and **rural areas** in the NWT, ● veryone will know at **all** times whether there are jobs to be had. It maka no sense, therefore, to **"look"** for a job if it is common knowledge that none are available. An alternative measure of unemployment in the frontier region might be the number of people stating that they wanted a job. This statistic was obtained in the survey and is shown in Table 3.

It will be recalled that 52 percent of the native people not working but wanting **jobs** were also involved in traditional pursuits, **four-fifths** of this number on a part-time basis and **one-fifth** year-round. These people, plus the 48 percent remaining **in** the job-wanted category who did not ● ngage in traditional pursuits, form a queue in which they wait, some perhaps in resignation, for jobs in the modem sector.

The Dual Labor Market in the NWT

The substantial discrepancy between the numbers of natives and non-natives not working but wanting jobs led some observers to imply that discriminatory hiring practices of a non-economic variety were at least partly responsible for the **differences.**[26] Without a comprehensive analysis, however, such a conclusion is premature. It neglects three important

determinants of unemployment. These are: differential migration patterns of natives and non-natives between the NWT and the rest of Canada, difference in levels of educational attainment; and difference in the geographic distribution of native and non-native populations.

Migration Patterns

In the recent past many non-natives have been attracted to the NWT by the offer of a job at an income typically higher than what could be earned in an otherwise similar position in southern Canada. While a few non-natives do establish permanent residence in the NWT, most *never* intend to remain for more than a few yearn. Thus, when there is a downturn in the NWT economy, the planned, as well as the unemployment-hastened return to southern Canada minimizes non-native unemployment in the NWT. Most of the observed non-native unemployment is, therefore, of a cyclical nature, with unemployment ratea approximating those for non-natives of similar ages and educations in southern Canada.[27]

Natives, on the other hand, have not moved to southern Canada "in any numbers but, rather, remain in the NWT during good times and bad, thus swelling the unemployed and job-wanted categories on a secular as well as a cyclical basis. Migration between the NWT and the rest of the world is shown for the 1976-81 period in Table 4.

Levels of Educational Achievement

Although a universal education program has been in place in the NWT for approximately 25 years, the native population as a whole compares very unfavorably with non-natives in terms of educational achievement, as shown in Table 5. This is due partly to the fact that natives now older than 40 years were adults before the program was initiated. In addition, during the first several yeara the practical value of a formal education was less apparent than it has become, and *many* natives dropped out after attending school only a few years. Non-native migrants to the NWT, by contrast, consist primarily of people drawn from the better educated southern Canadian labor force.

While there are still a number of jobs in the modern sector of the NWT economy which do not require a great deal of formal education, moat at least demand the ability to read, write and speak English and to perform the basic arithmetical operations acquired during the first six to eight years of formal schooling. By these criteria a substantial portion of the native population in the NWT is poorly prepared for participation in the majority of jobs in the modem economy without additional education or training.

Only 47 percent of natives who wanted jobs in the modern sector were employed at the time of the survey, while the corresponding figure for non-natives was 90 percent. Unemployment, defined for this analysis as wanting a job, whether actively looking or not, varied inversely with educational achievement as shown in Table 6. Within each ethnic group people with university, trade or high school educations had considerably lower unemployment rates than did those who had not completed high school.

Geographic Distribution

Unemployment also varied with location. Most of the non-native inhabitants of the NWT, some 85 percent, lived in its six largest communities. While only 25 percent of all natives made their homes in these centers, virtually all natives with university or high school educations lived in the urban centers. For natives with less than high school education, 46 percent of those living in the six larger communities were without jobs but wanting employment, compared with 59 percent in this category who lived in more remote settings. For non-natives the geographical pattern of unemployment was reversed. A total of 17 percent wanting jobs was recorded for urban residents without a high school education, but , for those living in rural areas the figure was 11 percent.

This geographical distribution of population and unemployment appears to reflect a preference on the part of non-natives for an urban environment as similar as possible to that of southern Canada. Native people, on the other hand, seem to prefer to live in smaller villages near areas which have been occupied by their ancestors for generations. The geographic distribution of natives may also reflect a perception, on the part of those with less than high school education, that the probability of unemployment is still very high even in the urban centers, and a conclusion that, if one is to be unemployed anyway, it might as well be in a preferred setting. This interpretation is supported by the fact that 66 percent of rural male natives with less than high school education indicated a willingness to move if *a* job *were* ensured elsewhere.[28] In any case, market-oriented economic activity is not easily generated at these remote villages even though exploration, resource ● xtraction and associated industry does provide ● mployment *near* some of the settlements from time to time. And although some market-oriented production of handicrafts occurs in the remote villages, jobs, in general, are scarce at these small and extremely isolated places.

In this and the two preceding sections, economic causes for differences in observed levels of unemployment between natives and non-natives have been identified: differential

migration ratea, differences in levels of educational achievement and differences in locational preferences. In the following section, tests for non-economic patterna of discrimination are conducted.[29]

Occupational Distribution of the Employed Labor Force

Occupations were identified at a very detailed level and grouped into "white collar" and "blue collar" classifications. Within the former, managerial and clerical categories were identified, while within the latter, skilled and unskilled categories were distinguished. Jobs in the managerial and the skilled labor classifications were assumed to represent the primary jobs of the dual labor market paradigm, while the clerical and unskilled labor classifications represent secondary jobs.[30]

Occupational distributiona of employed people by age, sex, ethnic origin and education achievement were then derived for each of the three levels of education attainment previously utilised, that ia, for university graduates, trade. *or* high school graduates, and for those with less than high school. These data were used to teat for the existence of a dud labor market.

Since this study ia of a developing area inhabited by people *of* two major ethnic groupinga, the investigation of the dual labor *market* focuses explicitly on differences between nativea and non-natives rather than on other possible segmentations such as between males and females. Thus, for example, in the analysis which follows, explicit comparisons are developed between native and non-native males and between native and non-native females rather than between all males and all females.

Five null hypotheses were teated. The first was that there ia no systematic difference in the proportion of primary jobs held by natives compared with non-natives within each age-sex-education category. In order to establish benchmarks for comparison, hypotheses two and three were that neither increased education (2) nor experience (3) leads to an increase in the proportion of primary jobs held by non-natives. Hypotheses four and five were that neither increased education (4) nor experience (5) leads to an increase in the proportion of primary jobs held by natives. If the first three- hypotheses were rejected, while four and five were accepted, plots of the survey data should reveal patterns similar to that shown in Figure 1.[31] If both four and five were also rejected, the lines for natives would have positive slopes but would lie below those for non-natives.[32] Finally, if there is a single labor market (acceptance of hypothesis one and rejection of two through five) there should

be no difference in the distribution of primary and secondary jobs between nativea and non-natives within the same age-sex-education categories.

Tables 7 through 10 are arranged to facilitate the kinds of comparisons suggested in Figure 1. The occupational distribution of employed university graduates is shown in Table 7 and that of employed technical and high school graduates in Table 8. Both these sets of data present some difficulties for comparisons. Although the occupational distribution of native university graduates is concentrated in the managerial classification, and, in fact, is more favorable than the non-native distribution, the numbers are so small as to limit the significance of this observation.

For technical and high school graduates, the numbers for natives are sufficiently large but the comparison with non-natives is complicated by the small number of natives in the 45-64 *age* group and the large number of male natives between 25-44 who did not identify their occupations. It is possible, however, to develop comparisons of the 321 male natives between 15-44 years who did state their occupations with the corresponding group of non-native males, and also to compare the 360 native females in the same age brackets, all of whom identified their occupations, with their non-native counterparts. These comparisons are summarized for easy reference in Figure 2. The percentage of each group holding primary jobs is shown by age group which serves as a proxy for experience. For both natives and non-natives, the percent holding primary jobs was greater in the 25-44 than in the 15-24 age group, implying advancement from secondary to primary jobs for both ethnic groups as experience is gained.33 For both males and females, however, a higher proportion of non-natives initially acquire primary jobs and this advantage increases with age. Specifically, primary employment for male natives, as an index of non-native male primary employment, falls from 88.06 for 15-24 year-olds to 86.01 for the 25-44 age group, although the number of nativea not stating their occupations calls the reliability of the latter observation into question.34 For females the index for the younger group is 88.08 and for the older, 80.38.

In Tables 9 and 10, the occupational distribution of employed persons with less than high school education is shown by ethnicity, age, sex, and averages of highest level of education attained. These data are presented in summary form in Figure 3. Once again the percentage of non-natives holding primary sector jobs exceeds the percentage held by natives of the same sex and age groups and, as previously, the percentages of both natives

and *non-natives* holding primary jobs increase with age. In these comparisons, however, the gaps between natives and non-natives narrow between the 15-24 and 25-44 age groups before widening again for the 45-64 age groups. As indexes of the percentage of *male* nativea holding primary jobs to non-native males holding primary jobs, the figures are 67.27, 73.55 and 72.20 for each higher age group, respectively. For females the indexes are 72.75, 90.71 and 76.08. Further, a comparison of these index numbers with those used to construct Figure 2 indicates that the gape between native and non-native employment in primary jobs are greater for those with less than high school than for technical or high school graduates, except for females in the 25-44 age group.[3s]

Comparisons based on the data in Tables 9 and 10, however, are potentially biased by the fact that nativea who have not graduated from high school have, on average, fewer years of formal education than non-natives within the same age group who have not completed high school. To the extent that job requirements are sensitive to these differences, it would be expected that a higher proportion of natives would be employed in secondary than in primary jobs. In order to compensate for the difference in levels of educational attainment, subsets of data were created for 388 male natives and 398 male non-natives between 25 and 44 years who had not graduated from high school but who had identical years of education. The occupational distributions of these groups were then compared. The results are shown in Figure 4 *on* which the indexes of native to non-native primary employment for male university, technical and high school graduates in the 25-44 age group have been added for reference. These data reveal that male natives who have not graduated from high school do hold a smaller proportion of primary jobs than male non-natives in the same age group with identical years of education, but that even among those who have not completed high school, the difference becomes smaller with an increase in education. Native to non-native primary employment is, at an index of 63.27 for those with exactly 8.0 years of formal education, below the mean for all those who are not high school graduates in the 25-44 age group (73.55). For those with grades of 10.0 and 11.0 yearn, the indexes of native to non-native primary employment are 75.85 and 81.73, respectively. By comparison, the index of native to non-native primary employment is 86.01 for male trade and high school graduates in the 25-44 age group and, for the limited number of university graduates, the index is 107.8.

Thirty Chi-square tests were performed on the occupational distributions, utilizing

both the primary and secondary classifications as well as the managerial, clerical, skilled and unskilled occupational categories, in order to test the five hypotheses referenced at the beginning of this section. The frost hypothesis was that there is no systematic difference in the proportion of primary jobs held by natives and non-natives within each age-sex-education category. This hypothesis was rejected for all comparisons which included people with less than university educations. The second and third hypotheses, that there is no increase in the percent of primary employment for non-natives with either increased education or greater experience, were then tested. Both were rejected for all comparisons. Hypotheses four and five, that neither education nor experience leads to an increase in primary employment for natives, were both rejected for all comparisons. In 28 of the 30 tests, the hypotheses were rejected at the 0.01 level. Statistics are provided in the appendix.

A Supplementary Observation on Income Distribution

Data collected in the 1971 and 1981 censuses makes it possible to compare samples of incomes of employed native and non-native family heads by yeare of formal ● duration. Even though the income data refer to different groups of individuals and are arranged differently from those collected in the 1984 survey used for this analysis, the patterns revealed are generally consistent with those just described.[36]

For both 1970 and 1980 the incomes of native family heads are below those of non-native family heads with similar educational qualifications, and, as with access to primary employment, the differences narrow with increased ● duration. As shown in Figure 5, the curve for native to non-native family income for 1980 is below that for 1970 for all educational levels through high school, but is above it for the three classifications for post-secondary educations. Even so, the overall ratio of native to non-native family incomes rose from 46 percent in the 1970 sample to 53 percent in the 1980 sample, as the average level of education of employed native family heads increased substantially between these datea. For example, 79 percent of employed native family heads had less than grade 9 educations in the 1970 sample compared with 44 percent in 1980. Unfortunately, access to the primary data is not possible; thus, statistical teats on income distributions cannot be performed.

Conclusions

General

The analysis contained in the previous sections indirectly demonstrates that many of the objectives set at the outset of the development program initiated in the late 1950s have been realized. A modern economy, integrated with that of southern Canada, has been created in the NWT. Most native people have acquired some formal education and those in younger age groups are remaining in school for more yearn than their parents or older brothers and sisters did. With respect to employment, natives now hold over 6,000 jobs in the modern economy, 38 percent of which are in the managerial and skilled categories. Thirty years ago only a handful of natives held jobs in the modern economy, virtually all of which were of a menial variety. These gains obviously represent accomplishments of some note.

The Dual Economy

The results of the analysis confirm the existence of both traditional and modem sectors within the NWT economy. Both sectors reveal interesting departures from the predictions of the conventional paradigms, however, and thus raise the question of whether the patterns observed in this study are unique to the NWT or whether they are typical of circumstances in other circumpolar regions where modern industry has expanded into areas previously characterised by traditional economies.

The traditional sector in the NWT occupies approximately 1,200 native people year-round and an additional 5,300 seasonally. Tests on the sample data establish that those who participate in traditional pursuits are older, hold fewer jobs in the modern sector and have less formal education than non-participants. The proportion *of* participants who also hold jobs in the modem sector (36 percent), however, seems greater than what ia ● ither implied by a *priori* theory or revealed by previous empirical analyses. A second departure from the theory concerns the use of an advanced rather than an inferior technology by those engaged in traditional pursuits. In spite of the modern technology, nevertheless, low returns are realised by those engaged in traditional activities due, apparently, to an excess number of participants.

Native people engage in traditional activities for a variety of reasons, some of which are non-economic and many undoubtedly leave this way of life only because they are compelled to do so by economic necessity. Given the substantial majority stating that they

want jobs in the modern economy, however, it is clear that for many, participation in "traditional pursuits is a way of occupying oneself while waiting in the queue for a job in the modern economy.

The Dual Labor Market

Two major tenets of this paradigm, segmentation and the existence of a queue, are supported by the analysis. On the other hand, and somewhat surprising, is the observed increase in the proportion of primary jobs held by natives associated with both experience and higher educations, implying greater mobility from secondary to primary jobs than what previous empirical research involving minority ethnic groups would indicate.[37]

Hypothesis tests established the statistical significance of observed differences between the proportions of natives and non-natives with less than high school and with high school or trade school diplomas holding primary jobs for each age-sex group.

Pre-market segmentation is implied by the significant differences between natives and non-natives, for all educational levels below university graduate, at the time of entry into the modern sector.

Within-market segmentation is observed to perpetuate initial differentiation for any given level of education. Although the proportion of both natives and non-natives holding primary jobs increases with experience, it is not clear that equal years of experience raises the ratio of native to non-native primary employment, holding level of education constant. In some comparisons it does somewhat, in others it does not,

Encouragingly, however, both pre-market and within-market segmentation appears to diminish with increased education. At each higher educational level, for each age-sex category, the difference between the proportion of natives and non-natives holding primary jobs diminishes until, for the few university graduates, the difference is reversed.

Taken together these observations appear to support the *following* interpretation.

Primary sector employers, as a group, discriminate against native people. The degree of discrimination may or may not be reduced as experience is gained, but it is definitely reduced with increased education.[38] Nevertheless, employed natives are crowded into secondary jobs. Thus, it may be said that a queue exists in which native people wait in secondary occupations for a primary job. This crowding would also assist in explaining the observed differences in incomes of family heads with similar levels of educational achievement.

Notes

[1]I would like to thank Ralph Joyce, Territorial Statistician, and Nunda Rao of the NWT Bureau of Statistics for their substantial assistance in configuring and tabulating the survey data to meet the requirements of this study. Thanka are also due to Doug Norris of Statistics Canada for providing access to previously unpublished data on native migration, and for the special tabulation comparing a sample of incomes of native with non-native heads of households. Finally, I would like to thank Robert Bone, Lee Huskey, Larry St. Louis and two anonymous referees who made several constructive suggestions on an earlier draft. Capable research resistance was provided by Ruthanne Stabler.

[2]People of native ancestry made up 58 percent of the total population of the Northwest Territories at the time of the 1981 census. The Inuit (Eskimo) are the largest native group, comprising approximately 57 percent of the native population. The Dene (Indian) and Metis (mixed ancestry) account for 27 and 15 percent, respectively. Canada, 1981 *Census:* Native *Peoples Microfiche Documentation* (Ottawa: Census of Canada, 1981).

[3]Peter J. Usher, *A* Northern *Perspective on the Informal Economy* (Ottawa: The Vanier Institute, 1980); Mel Watkins, "From Underdevelopment to Development," in Mel Watkins, cd., *Dene* Nation: *The Colony Within* (Toronto: University of Toronto Press, 1977); and Gurston Dacks, A *Choice of Futures: Politics* in the Canadian North (Toronto: Methuen Publications, 1981).

'Labor force statistics provided in the Canadian census focus on people engaged in the modern economy and on the unemployed actively seeking wage ● mployment. People without jobs who are not actively looking for wage employment as well as those engaged in traditional or subsistence activities are largely omitted. Native *Peoples* Microfiche. A tantalizing, but disappointing, manpower survey conducted in the Yukon and NWT between 1969 and 1971 included oniy natives, thus precluding comparisons of the type required co teat the dual labor market hypothesis. The survey also excluded those engaged in traditional activities whose participation did not generate a cash income, thereby

complicating any investigation of the dual economy paradigm. See Sheila M. Meldrum and Marian Helman, "Survey of the Statistical Data From the DIAND Northern Manpower Survey Program in the Yukon and NWT: 1969-1971," (Ottawa: Department of Indian Affairs and Northern Development, 1975). A substantial bibliography of (mainly) case studies on training and employment written between 1970 and 1986 is found in J. C. Finlay and C. R. Goodwin, eds., *The Training and Employment of Northern* Canadians (Calgary: The Arctic Institute of North America, 1986). Highly useful income and product accounts were compiled for the NWT beginning in 1967, first by John Palmer and later by Marry Pavich. Unfortunately they were discontinued in 1978. DIAND, Economic *Accounts,* Yukon *and NWT* (Ottawa: Department of Indian Affairs and Northern Development, annually, 1967- 1978). These records provide conventional income accounting data but do not, of course, identify ethnicity of income recipients. Further, the methodology used in incorporating traditional activities into these accounts has been justifiably criticized. See Peter J. Usher, "Evaluating Country Food in the Northern Native Economy," Arctic, 20, 1976, and Peter J. Usher and George Wenzel, "Native Harvest Surveys and Statistics: A Critique of Their Construction and Use," Arctic, 40, 1987. Some recent impact studies' have produced comprehensive information for specific regions, although methodologies often differ from one study to the next. Two detailed analyses of the Mackenzie Valley are found in DIAND, Regional *Impact of an* Arctic *Gas Pipeline,* 7 vols. (Ottawa: Department of Indian Affairs and Northern Development, 1973) and Thomas R. Berger, *Northern* Frontier, Northern *Homeland: The Report of the Mackenzie Valley* Pipeline Inquiry, 2 vols. (Ottawa: Supply and Services Canada, 1976). Numerous case studies of small, village-centered areas provide fine-grained detail *on* socio-economic conditions in remote northern communities. See, for example, E. Treude, "Pond Inlet, Northern Baffin Island: The Structure of an Eskimo Resource Area," *Polar Geography,* 1, 1977 and N. C. Quigley and N. J. McBride, "The Structure of an Arctic Microeconomy: The Traditional Sector in Community Economic Development," Arctic, 40, 1987.

'The survey was based on systematic samples in the NWT's six largest communities. In all other communities an effort was made to interview persons in every dwelling. Northwest Territories, *Labour Force Survey:* Preliminary *Report* (Yellowknife, NWT: Bureau of Statistics, April 1985).

[6]K. J .Crowe, A *History of the* Original *People of Northern Canada* (Montreal and

London: Arctic Institute of North America, McGill-Queen's University Press, 1974); Peter J. George and Richard J. Preston, " 'Going in Between': The Impact of European Technology on the Work Patterns of the Weat Main Cree of Northern Ontario," *Journal of* Economic *History*, 47, 1987; Usher, A *Northern Perspective* . . . ; and Michael Asch, "The Dene Economy," in Watkins.

[7]Asch, p. 51.

[8]F. G Vallee, *Kabloona and Eskimo in the Central Keewatin* (Ottawa: Northern Co-ordination and Research Centre, 1962), and W. G. Devitt, "History of Education in the Northwest Territories," in *Education North of 60, A* Report prepared by Members of the Canadian Association of School Superintendents and Inspectors (Toronto: Ryerson Press, 1965). see also Asch, and Usher, *A Northern Perspective* . . . .

[9]Quoted *in* Asch, pp. 52-53.

[10]M. R. Hargrave, "Changing Settlement Patterns Amongst the Mackenzie Eskimos of the Canadian North West Arctic," in W. C. Wonders, cd., *Canada's Changing North* (Toronto: McClelland and Stewart, Ltd., 1971), and Scott Rushforth, "Country Food," in Watkins. Farley Mowat, The *People of the Deer* (Boston: Little, Brown and Co., 1952, chap. 20), identifies periodic food shortagea as an additional reason for encouraging permanent settlement in locations which could be routinely supplied from southern Canada. See also Asch, pp. 53-55, and George and Preston, p. 451.

[11]See Vallee, and D. B. Shimkin, "The Economy of a Trapping Center: The Case of Fort Yukon, Alaska," Economic *Development and Cultural Change,* 3, 1955, for case studies from the 1950s. For the late *1960s* see Chun-Yan Kuo, A *Study of Income and Income* Distribution in: (1) the Mackenzie District, (2) The *Arctic Coast and Baffin Regions, and (9) the Keewatin District of Northern* Canada (Ottawa: Department of Indian Affairs and Northern Development, 1972, 1973 and 1974).

[12]Edgar J. Dosman, The *National* Interest: *The Politics of Northern* Development (Toronto: McClelland and Stewart, Ltd., 1975); David Judd, *"Canada's* Northern Policy: Retrospect and Prospect, " *Polar Record,* 14, 1969; and J. C.- Stabler and M. R. Olfert, "Gaslight Follies: The Political Economy of the Western Arctic, " Canadian Public Policy, *6,* 1980.

[13]In the northern Canadian context it is argued by some that exploitation of non-renewable resources in particular creates the risk of substantial environmental damage, such

as would follow a major oil spill in arctic waters. Further, pipelines and roads could interfere with caribou migration routes, calving grounds or areas used for nesting grounds by migratory birds. On the social side, it is said, the prevailing ideology of an industrial society depreciates traditional or subsistence activities and glorifies wage employment and economic status, thus undermining the foundation of native societies. These views were vigorously advanced in the presentations made to the Berger inquiry and are sympathetically reported in Berger. An investigation of these propositions is, of course, beyond the scope of this analysis.

[14]The initial exposition of the theory of the dual economy was by J. H. Boeke, *Economics and* Economic Policy *of Dual Societies (New* York: Institute of Pacific Relations, 1953). The concept was given greater *(economic)* focus by Benjamin Higgins, "The Dualistic Theory of Underdeveloped Areas," *Economic Development and Cultural Change,* 4, 1956. Other early related contributions were made by W. Arthur Lewis, "Economic Development With Unlimited Supplies of Labour," *The Manchester School of* Economics *and Social* Studies, 22, 1954, and Harvey Leibenstein, "The Theory of Underemployment in Backward Economies," *Journal of Political Economy, 65, 1957.* The evolution of the literature on the dual economy can be traced through Michael Todaro, "A Model of Labor Migration and Urban Unemployment in Less Developed Countries," *American* Economic *Review,* 59, 1969; John R. Harris and Michael P. Todaro, "Migration, Unemployment and Development: A Two Sector Analysis, " American *Economic Review, 60, 1970;* W. H. Singer, "Dualism Revisited: A New Approach to the Problems of the Dual Society in Developing Countries," Journal *of Development Studies,* T, 1970; William E. Cole and Richard D. Sanders, "A Modified Dualism Model for Latin American Economies, " Journal *of* Developing *Areas,* 6, 1972; Lisa R. Peattie, "Anthropological Perspectives on the Concepts of Dualism, the Informal Sector, and Marginality in Developing Urban Economies," International Regional Science *Review,* 5, 1980; Lynne G. Zucker and Carolyn Rosenstein, "Taxonomies of Institutional Structure: Dual Economy Reconsidered, " American Sociological Review, 46, 1981; and Saral Tielhet-Waldorf and William H. Waldorf, "Earnings of Self-Employed in an Informal Sector: A Case Study of Bangkok, " Economic *Development and Cultural Change,* 31, 1983. Several useful case studies have also been published by the International Labour Office.

[15]The notion of labor market segmentation can be traced at least as fax back as the

writings of J. S. Mill and Karl Marx in the nineteenth century. Modern contributors, however, acknowledge Clark Kerr, "The Balkanization of Labor Markets," in E. Wright Bakke, et of., *Labor Mobility and Economic opportunity (Cambridge: MIT* Press, 1954), as an important predecessor in the development of the theory of the dual labor market. Another early modem contributor was Robert T. Averitt, *The Dual Economy (New* York: Norton, 1968). Probably the best known contemporary proponents are P. B. Doeringer and M. J. Piore, *Internal Labor Markets and Manpower Analysis* (Lexington Heath, 1971). These writers have made numerous additional contributions to this literature during the 1970s and 1980s and their work has stimulated much debate and research. See, for example, Nicholas Bosanquet and Peter Doeringer, "Is There a Dud Labour Market in Great Britain?" The Economic *Journal*, 83, 1973; Paul Osterman, "An Empirical Study of Labor Market Segmentation," *Industrial and Labor Relations Review, 28, 1975; Glen G. Cain,* "The Challenge of Dud and Radical Theories of the Labor Market to Orthodox Theory," American *Economic Review, Papers and Proceeding 05, 1975;* David C. Smith, The *Dual Labour Market Theory: A Canadian Perspective* (Kingston: Industrial Relations Centre of Queen's University, 1976); Joseph Persky, "Dualism, Capital-Labor Ratios and the Regiona of the U.S.," *Journal of Regional Science,* 18, 1978; Michael Reich, "Segmented Labour: Time Series Hypothesis and Evidence," *Cambridge Journal of Economies,* 8, 1984; and William T. Dickens and Kevin Lang, "A Test of Dual Labor Market Theory," *American* Economic *Review,* 75, 1985.

[16]An impressive bibliography of regional case studies of native harvests is found in Usher and Wenzel, "Native Harvest Surveys and Statistics," while numerous studies of training programs, employment options and work experiences are critiqued in Finlay and Goodwin.

[17]Canada, *1981 Census:* Native *Peoples* Microfiche *Documentation.* Canadian dollars converted to U.S. dollars. For a discussion of price levels see W. T. R. McLean and M. E. Styles, *Cost of Living* Study for the *Northwest Territories* (Edmonton: Marketing Information Studies Ltd., 1974), and Donna H. Green and Milford B. Green, "The Food Retailing Structure of the Northwest Territorial," Arctic, 40, 1987. In addition, Statistics Canada conducts periodic spatial retail price surveys at approximately 50 communities in the NWT. This information is used in the development of isolated-post allowances for federal civil servants. The most recent indexes list 40 of 51 NWT communities with "living cost

"differentials" at least 40 percent higher than the major southern city with which the comparison is made (Ottawa Statistics Canada, n.d.).

[18] The powers and responsibilities now accorded to the NWT are much the same as the powers of a province, the major exception being that the ownership, control and administration of non-renewable resources resides with the government of Canada. See Gordon Robertson, *Northern Provinces: A Mistaken Goal* (Montreal: The Institute for Research on Public Policy, 1985). While most northerners fervently believe that their well-being would be enhanced by ownership of non-renewable resources, this would not have been the case into the mid- 1980s. For non-renewable resource programs, the administration costs have historically just about equalled revenues collected in the NWT. Nor is it unequivocally clear that ownership in the future would be preferable to some of the revenue-sharing schemes that have been recently proposed. Jack C. Stabler, "Fiscal Viability and the Constitutional Development of Canada's Northern Territories," *Polar Record, 23, 1987.*

[19] Charles W. Hobart, "Impacts of Industrial Employment on Hunting and Trapping Among Canadian Inuit," in M. M. R. Freeman, cd., *Renewable Resources and the Economy of the North* (Ottawa: Association of Canadian Universities for Northern Studies, 1981). See also George and Preston.

*"Jack C. Stabler, "Interindustry Relations of a Frontier Economy," *Canadian Journal of Regional Science*, 7, 1984.

'l Peter J. Usher, *The Banksianders:* Economy *and Ecology of a* Frontier Trapping Community (Ottawa Department of Indian Affairs and Northern Development, 1970); L. Muller-Wille, "Cost Analysis of Modern Hunting Among the Inuit of the Central . Canadian Arctic," *Polar Geography, 2, 1978;* Heather Myers, "Traditional and Modern Sources of Income in the Lancaster Sound Region, " *Polar Record, 21, 1982;* and R. Riewe, "The Utilization of Wildlife in the Jones Sound Region by the Grise Fiord Inuit, " in L. C. Bliss, cd., *Truelove Lowlands, Devon Island, Canada: A High Arctic Ecosystem* (Edmonton: University of Alberta Press, 1977); and Quigley and McBride. See also G. F. Hartman, "Managing Non-Native Renewable Resource Use in the North: Rising Expectations in Unproductive Ecosystems," in Freeman.

[22] Since native people have moved into permanent settlements, the largely unrestricted utilization of resources in the vicinity of the communities appears to have led to a situation in which it is difficult to continuously earn more from the consumption and sale of the

harvest than it costs to collect it. While resources may be more plentiful in areas remote from the settlements, they are also more costly to harvest. See Scott Rushforth, "Country Food," in Watkins; B. F. Friesen and J. G. Nelson, "An Overview of the Economic Potential of Wildlife and Fish Resources in the Canadian Arctic," in R. F. Kieth and J. B. Wright, eds., *Northern Transitions*, Vol. 2 (Ottawa: Canadian Arctic Resources Committee, 1978); and W. A. Fuller and B. A. Hubert, "Fur, Fish and Game in the Northwest Territorial: *Some* problems of, and Prospects for, Increased Harvests," in Freeman. For a critique of the methods used to evaluate native harvests, see Usher and Wenzel.

[23]N. S. Novakowski and V. E. F. Solman, "Potential of Wildlife as a Protein Source," *Journal of Animal* Science, 40, 1975, and Peter J. Usher, *"Sustenance or* Recreation? The Future of Native Wildlife Harvesting in Northern Canada," in Freeman.

[24]It is possible that the exit of a substantial number of people engaged in traditional activities (or programs that increased the sustained yield of renewable resource harvests), would lead to a rise in marginal productivity and that participation following such an adjustment would be viewed more favorably.

[25]The hypothesis was further tested in 36 pairwise comparisons, within given age groups, of males not engaged in traditional pursuits with those who were. In 30 of the comparisons the hypothesis was rejected, 21 at the 0.01, 4 at the 0.05 and 5 at the 0.10 level.

[26]Berger, vol. I, p. 123; Watkins, "From Underdevelopment to Development," pp. 88-89; and Hugh Brody, The *People's Land: Eskimos and Whites in the* Eastern Arctic (Middlesex: Penguin Books, Ltd., 1975), pp. 222-223.

[27]See Jack C. Stabler, "Development Planning North of 60 Requirements and Prospects," in Michael S. Whittington, The *North* (Toronto: University of Toronto Press for the Royal Commission on the Economic Union and Development Prospects for Canada, 1985).

[28] Because of the income supplements previously mentioned, cash income for native people without jobs varies little between urban and rural settings, or between rural unemployment and sporadic employment in urban jobs at minimum wage. Thus urban centers are seen as attractive primarily by those whose expectation of obtaining a permanent job is reasonably high, that is, people with university or high school educations. The

probability of an affirmative *response* to the willingness to relocate question was directly related to- level of education and inversely related to age.

[29]There were no affirmative action programs in force in the NWT prior to or at the time of the 1984 survey. Some developments requiring government (regulatory) approval were subject to a "northern preference" hiring policy under which all qualified northern residents were given preference.

[30]Job descriptions, given by respondents during the interviews, were coded into occupational classifications by the author following the occupational classification system used for the Canadian census. By utilizing the census classifications, standard groupings are maintained and the individual researcher's subjective judgement is minimised. For more on this and other methodological questions, see Paul Ryan, "Segmentation, Duality and the Internal Labour Market," in Frank Wilkinson, cd., The *Dynamics of Labour Market Segmentation (New* York: Academic Press, 1981). Whether one agrees with the definition of primary and secondary jobs used in this paper, the managerial and skilled occupations are clearly observed to be "superior" while the unskilled and clerical occupations are "inferior." Increased education or experience (age) is observed to be associated with an increase in the proportion of employment in managerial and skilled and a reduction in clerical and unskilled occupations. A similar classification scheme is used by Linda Datcher-Loury, "Racial Differences in the Stability of High Earnings Among Young Men, " *Journal of Labor Economics*, 4, 1986.

[31]Figure 1 is adapted from Dickens and Lang.

[32]See Ryan.

[33]This observation remains true regardless of what type of occupation those not stating are actually employed in.

[34]This general conclusion is valid as long as no more than 47 of the 57 natives not stating their occupations are in fact employed in primary jobs.

[35]The comparisons reported in the text are for all natives and all non-natives with less than high school educations. Comparisons baaed on separate urban and rural classifications indicate that, although urban dwellers, both native and non-native, hold a somewhat higher proportion of primary jobs than rural dwellers, the relative relationships are unchanged.

[36]There were 1,700 native and 3,310 non-native family heads in the 1970 data. The

1980 data included 2,845 native and 4,770 non-native family heads. The comparisons shown in Figure 5 include people of both sexes and all ages.

[37]Sam Rosenberg, "Male Occupational Standing and the Dual Labor Market," *Industrial Relations*, 19, 1980, and Bradley R. Schiller, "Relative Earnings Mobility in the United States," American *Economic Review, 57, 1977.*

[38]There ia one additional consideration that should be mentioned. The market is sensitive to unmeasured heterogeneous skills not identified within the data base used for this study. Grouping by age, sex and education reduces but doea not eliminate individual diversity. See Frank M. Gallop and Dale W. Jorgenson, "Sectoral Measures of Labor Cost for the United Statea, 1948- 1978," in Jack E. Triplett, cd., The *Measurement of Labor Cost* (Chicago: University of Chicago Press, 1983), and Daniel S. Hamermesh and James Grant, "Econometric Studies of Labor-Labor Substitution and Their Implications for Policy," *Journal of Human Resources.* 14, 1979. In a recent study based on a 4 percent sample of prime age white males from the 1980 U.S. Current Population Survey by James J. Heckman and Guilherme Sedlacek, "Heterogeneity, Aggregation, and Market Wage Functions: An Empirical Model of Self Selection in the Labor Market," *Journal of Political Economy, 93,* 1985, accounting for unmeasured heterogeneity reduced aggregate wage inequality by approximately 11 percent when compared with a random sectoral assignment of workers with similar measurable characteristics. It is possible that unmeasured heterogeneity does account for some of the differences between natives and non-natives within the same age-sex-education categories observed in this study. Given the magnitude of the differences and the pervssiveness, both of pm-market and within-market segmentation, over both sexes, all ages and all educational levels below university graduate, however, corrections of the magnitude observed by Heckman and Sedlacek would not alter the qualitative conclusions.

Table 1 Participation[a] in Traditional Pursuits by **NWT** Natives Between 15 and 64 Yeara, **by** Age., Sex, Modern Labor Force Participation and Average Years of Formal Education,[b] 1984[c]

	Males							
	15-24		25-44		45-64		Row	
	No.	Grade	No.	Grade	No.	Grade	Totals	Mean
Not Engaged in Traditional Pursuits								
Employed	432	9.04	944	8.98	234	2.85	1610	8.14
Not Working-Want Job	579	8.27	498	8.05	156	4.35	123S	7.45
Do Not Want Work	31	5.28	31	6.90	72	1.56	134	3.59
Column Totals	1042		1473		462		2977	7.77
Engaged in Traditional Pursuits								
One to Three Months								
Employed	220	8.21	528	7.90	165	2.23	913	6.94
Not Working-Want Job	532	7.52	451	6.47	186	1.25	1169	6.13
Do Not Want Work	42	7.02	12	4.42	86	0.81	140	3.00
Column Totals	794		991		437		2222	6.26
Four to Six Months								
Employed	62	9.07	140	8.55	53	3.86	255	7.69
Not Working- Want Job	220	7.25	188	7.61	78	1.58	486	6.52
Do Not Want Work	12	6.16	14	2.95	29	0.86	55	2.59
Column Totals	294		S42		160		796	6.64
Seven to Eleven Months								
Employed	18	8.26	47	9.03	12	1.71	77	7.74
Not Working-Want Job	47	6.S1	54	6.44	23	1.19	124	5.53
Do Not Want Work	2	3.00	5	4.38	11	0.00	18	1.96
Column Totals	67		106		46		219	6.14
All Year								
Employed	59	7.72	241	6.15	100	0.50	400	5.01
Not Working-Want Job	176	7.29	253	5.40	119	1.15	548	5.07
Do Not Want Work	2s	6.53	34	5.04	63	0.54	120	2.91
Column Totals	258		528		282		1068	4.80

Continued

multicolumn9cTable 1 (concluded)

	Females							
	15–24		25-44		45-64		Row	
	No.	Grade	No.	Grade	No.	Grade	Totals	Mean
Not Engaged in Traditional Pursuits								
Employed	614	9.10	1087	9.25	248	4.96	1949	8.66
Not Working-Want Job	992	8.19	745	6.84	261	2.20	1998	6.91
Do Not Want Work	175	8.10	295	6.84	201	1.58	7s1	5.29
Column Totals	1781		2127		770		4678	7.40
Engaged in 'Traditional Pursuits								
One to Three Months								
Employed	190	8.59	298	0.13	83	1.19	571	6.22
Not Working- Want Job	340	7.57	350	5.54	177	0.92	867	5.39
Do Not Want Work	54	7.54	95	5.64	115	0.73	264	3.39
Column Totals	584		743		375		1702	5.44
Four to Six Months								
Employed	21	9.28	42	7.74	23	1.48	86	6.40
Not Working-Want Job	49	7.13	8S	4.56	44	1.45	178	4.51
Do Not Want Work	11	7.91	21	6.36	48	0.75	80	3.14
Column *Totals*	81		148		115		344	4.67
Seven to Eleven Months								
Employed	12	8.96			4	0.76	16	6.80
Not Working-Want Job	4	8.44	14	4.33	6	1.03	24	4.13
Do Not Want Work	9	5.00	5	4.00	7	0.00	21	3.64
Column Totals	25		19		17		61	4.78
All Year								
Employed	9	6.18	14	6.55	8	0.18	31	4.79
Not Working-Want Job	17	6.61	26	4.89	17	0.00	60	3.96
Do Not Want *Work*	10	5.98	18	4.69	17	2.31	45	4.05
Column Totals	36		58		42		136	4.18

source: NWT, Bureau of Statistics, *1984 Labor Force Survey.*

[a] In addition to the totals itt the table, 283 males attd *70* females participated in traditional pursuits but did not indicate the number of mont Its. Information regarding participation in traditional activities was not ● vailable for 118 males and 187 females.

[b] Information was ● vailable for 275 males and 207 females on participation and labor *force* activity but not on highest grade completed. These people are included in the ● ppropriate totals shown but were excluded in calculating the means for yeare of ● ducatkn.

[c] There were 1,437 native people between the ages of M cod S4 who were full time students aod did not want a job. No information wee obtained ● bout thie group regarding either labor force activity or participation in traditional activities.

Table 2. Percentage Distribution of Labor Force in Northern Economies by Industry and Ethnic Origin — Early **1980s**

Industry	Alaska		Yukon		NWT	
	Non-Native	Native	Non-Native	Native	Non-Native	Native
Total Labor Force[a]	139,898	15,762	11,485	1,480	11,895	7,290
Agriculture	3.0)	4.0)	0.7	–	–	–
Forestry, Fisheries	)	)	0.8	2.7	0.6	3.5
Mining	3.2	1.4	11.3	7.1	14.5	6.6
Construction	8.3	7.9	7.3	8.5	4.5	6.5
Manufacturing	6.0	5.7	2.7	2.3	1.4	3.9
Trans-Commun-Util	13.5	10.7	13.6	9.1	12.4	8.9
Trade	18.2	11.2	14.5	7.1	10.8	11.6
FIRE	5.3	2.7	4.s	2.0	3.6	3.9
Bus-Pers Services	28.0	35.0	25.3	22.6	24.9	26.0
Public Admin	15.3	21.3	18.9	34.8	27.0	25.7
Other				3.4	-	3.2

• Figures for the Yukon and NWT refer to the total labor force. Alaska figures are for the ● mployed labor force.

Source: M. J. Levin *d d.*, *A Demographic and Socio-Economic Profile of Alaska Natives: 1980.* U.S. Department of Commerce, Bureau of Census, 1981. Statistics Canada, *Census of Canada*, 1981.

Table 3. Labor Force Activity in the Modern Economy — NWT, 1984

	NWT	Natives	Non-Natives
Persona 15-64 years	31,163	16,299	14,864
Employed	17,775	6,132	11,643
Unemployed	3,534	2,701	833
Labor Force	21,309	8,833	12,478
Participation Rate	68	54	84
Unemployment Rate	17	31	7
Worked in 1984	23,438	10,472	12,966
Job Wanted	8.322	7.011	1.311

Source: NWT, Bureau of Statistics, *1984 Labor Force Survey.*

Table 4. Migration Between the NWT and the Rest of the World by Ethnic Origin, 1976-1981

	Non-Native		Native	
	Absolute	% of 1981 Non-Native Population	Absolute	% of 1981 Native Population
Into NWT	7,985	41.79	815	3.08
out of NWT	9,525	49.85	915	3.46

Source: Statistics Canada, Census worksheets, 1981.

Table 5. Percent of Population 15 Years and Older by Ethnic Origin, and Highest Level of Formal- Education, NWT, 1981 .-

	Native		Non-Native	
Level	Percent	Cumulative	Percent	Cumulative
less than 1[a]	25	25	1	1
1-4	8	33	1	2
5-8	SO	63	5	7
9-13	20	83	25	32
High School Grad	2	85	11	43
Technical[b]	13	98	29	72
Some University	1	99	10	82
University Grad	1	100	18	100

Source: Statistics Canada, *Census of Canada: Native Peoples Microfiche Documentation*, 1981.

[a] Includes kindergarten.

[b] Other non-university certificate or diploma.

Table 6. Employed and Unemployed by Ethnicity and Educational Achievement, NWT — 1984

	University		Trade-High School[a]		Less than High School		Education Data Missing	
	Native	Non-Native	Native	Non-Native	Native	Non-Native	Native	Non-Native
Number	81	2,889	979	5,728	11,644	4,243	439	96
Working	68	2,778	780	5,203	5,084	3,566	200	96
Not Working, Want Job	1s	111	199	525	6,560	677	239	-
Percent Wanting Job	16	4	20	9	56	16	54	

Source: NWT, Bureau of Statistics, *1984 Labor Force Survey.*

[a] Includes people with some university but who do not have degrees.

Table 7. Occupational Distribution of Employed NWT Population Between 15 and 04 Years with University Degree, by Age and Ethnic Origin, 1984

	Natives						Non-Natives					
	15-24		25-44		45-04		15-24		25-44		45-64	
Occupation	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Males												
Not Stated	-		4	9.76	-				7	0.55		
Managerial[a]	-		34	82.93	-		37	52.88	977	76.75	283	88.44
Clerical-Sales	-		3	7.32	-		32	45.71	133	10.45	12	3.75
Skilled Labor	-								103	8.09	25	7.81
Unskilled Labor	-						1	1.43	53	4.16		
Totals			41				70		1273		320	
Females												
Not Stated	-								5	0.54		
Managerial[a]	-		*23*	*95.83*	1	100.00	61	80.26	749	80.45	71	66.36
Clerical-Sales	2	100.00	1	4.17	-		7	9.21	16S	17.51	36	33.64
Skilled Labor	-						8	10.53	14	1.50		
Unskilled Labor	-											
Totals	2		24		1		70		931		107	

Source: NWT, Bureau of Statistics, *1984 Labor Force Survey.*

[a] Includes professional occupation.

Table 8. Occupational Distribution of Employed NWT Population Between 15 and 64 Years with High School," Technical or Trades Diploma by Age and Ethnic Origin, 1984

	Natives						Non-Natives					
	15-24		25-44		45-64		15-24		2544		45-64	
Occupation	No.	%	No.	%	No.	%	TK-	%	*No.*	%	No.	%
Males												
Not Stated	2	2.00	57	20.36			6	0.96	25	1.S6	4	1.09
Managerial[b]	6	6.00	89	31.79			162	26.05	811	44.10	198	53.80
Clerical-Sales	22	22.00	51	18.21	4	80.00	86	13.83	166	9.03	44	11.96
Skilled Labor	52	52.00	79	28.21	1	20.00	252	40.51	778	42.31	105	28.53
Unskilled Labor	18	18.00	4	1.43			116	18.65	59	3.21	17	4.62
Totals	100		280		5		622		1839		388	
Females												
Not Stated									6	0.40		
Managerial[b]	32	30.19	94	37.01	33	97.06	153	27.03	579	38.99	87	26.44
Clerical-Sales	61	57.55	149	58.66	1	2.94	343	60.60	744	50.10	161	48.94
Skilled Labor							41	7.24	102	6.87	71	21.58
Unskilled Labor	13	12.26	11	4.33			29	5.12	54	3.64	10	3.04
Totals	106		254		34		566		1485		329	

Source: NWT, Bureau of Statistics, 194 *Labor Force Survey.*

[a] **Includes people with some university who do not have degrees.**

[b] **Includes professional occupations.**

Table 9. Occupational Distribution of NWT Males Between 15 and 64 Years Without **Diplomas** or Degrees, by **Ethnicity,** Age and Average Years of Formal Education[a-b]

English-Speaking **Males**	Native						
	Age						
	15–24		25-44		45-64		
Occupation	No.	Grade	No.	Grade	No.	Grade	Row **Totals**
Not Stated	23	7.67	33	7.56	6	4.14	62
Managerial[c]	44	9.67	285	9.00	51	7.18	380
clerical-sales	100	8.75	188	8.73	9	9.39	297
Skilled Labor	239	8.46	591	8.17	134	3.67	964
Unskilled Labor	281	7.90	281	7.29	8S	3.71	64s
Column Totals	687		1378		283		2348

English-Speaking Males	Non-Native						
	Age						
	15-24		25-44		45-64		
Occupation	No.	Grade	No.	Grade	No.	Grade	Row **Totals**
Not **Stated**	6	10.00	31	11.29	4	8.00	41
Managerial[c]	27	10.26	372	11.16	192	11.03	591
Clerical-Sales	18	11.39	30	10.92	3	5.53	51
Skilled Labor	203	10.27	848	10.40	364	8.56	1415
Unskilled Labor	115	9.53	124	10.45	42	8.12	281
Column Totals	369		1405		605		2379

Source: NWT, Bureau of Statistics, *1984* Labor *Force Survey.*

[a] Excludes people for whom education data are missing. See Table 6.

[b] Excludes 453 employed males who do not speak English.

[c] Includes professional occupations.

Table 10. Occupational Distribution of NWT Females Between 15 and 64 Years Without Diplomas or Degrees, by **Ethnicity,** Age and Average Years of Formal Education[a,b]

English-Speaking Females	Native						
	Age						
	15-24		2544		-64		
Occupation	No.	Grade	No.	Grade	No.	Grade	Row Totala
Not Stated	18	8.40	15	9.16	6	8.00	39
Managerial'	79	8.76	211	9 900	25	5.79	315
Clerical-Sales	344	8.76	529	8.97	31	4.87	904
Skilled Labor	79	8.84	102	7.42	37	4.96	218
Unskilled Labor	217	8.07	182	7.82	70	5.37	469
Column Totals	737		1039		169		1945
English-Speaking Females	**Non-Nat re**						
	Age						
	15-24		25-44		45-64		
Occupation	No.	Grade	No.	Grade	No.	Grade	Row Totals
Not Stated			6	11.00	11	12.00	17
Managerial'	21	11.39	146	10.93	53	11.40	220
Clerical-Sales	249	10.48	264	10.89	96	10.45	609
Skilled Labor	98	10.14	38	9.86	59	9.82	195
Unskilled Labor	26	9.72	98	7.92	22	7.60	146
Column Totals	394		552		241		1187

Source: NWT, Bureau of Statistics, *1984 Labor Force Survey.*

[a] Excludes people for whom education data are missing. See Table 6.

[b] Excludes 164 employed females who do not speak English.

[c] Includes professional occupations.

Appendix
Results of Hypothesis Tests

The Dual Economy

Null Hypothesis I. The age-activity distributions of male natives not engaged in tradition activities is the as those who are engaged.

Comparisons	Results	Chi-square	d.f.	Level
1. Non-participants vs. year-round	Reject	192.17	9	0.01
2. Non-participants vs. 7-11 months	Reject	41.44	9	0.01
3. Non-participants vs. 4-6 months	Reject	132.24	9	0.01
4. Non-participants vs. 1-3 months	Reject	108.80	9	0.01

Null Hypothesis II. The mean level of formal education of male natives *not* engaged in tradition activities same as those who are engaged.

Comparisons	Results	t	d.f.	Level
1. Non-participants vs. year-round	Reject	21.95	1067	0.01
2. Non-participants vs. 7-11 months	Reject	5.68	218	0.01
3. Non-participants vs. 4-6 months	Reject	7.96	795	0.01
4. Non-participants vs. 1-3 months	Reject	14.78	2221	0.01

The Dual Labor Market

Null Hypothesis I. There is no systematic difference in the proportion of primary jobs held by natives com with non-natives within any age-sex-education category. Comparisons denoted (a) are based on the four occupa categories utilised while (b) refers to the primary-secondary classification.

Comparisons	Results	Chi-square	d.f.	Level
1 (a) Male HS grads 15-44	Reject	67.58	8	0.01
(b) Male HS grada 15-44	Reject	30.19	4	0.01
2 (a) Female HS grada 15-44	Reject	37.50	8	0.01
(b) Female HS grads 15-44	Reject	8.24	4	0.10
3 (a) Mde < HS 15-64	Reject	569.45	12	0.01
(b) Mde < HS 15-64	Reject	541.34	6	0.01
4 (a) Female < HS 15-64	Reject	267.03	12	0.01
(b) Female < HS 15-64	Reject	96.39	6	0.01
5 (a) Male < HS 25-44 controlled for identical grades	Reject	240.96	16	0.01
(b) Male < HS 25-44 controlled for identical grades	Reject	96.39	8	0.01

Null Hypothesis II. Increased education does not lead to an increase in primary jobs held by non-natives.

Comparisons	Results	Chi-square	d.f.	Level
1 (a) Males W/O HS vs. with HS 15-44	Reject	324.01	8	0.01
(b) Males W/O HS vs. with HS 15-44	Reject	1s.74	4	0.01
2 (a) Females W/O HS vs. with HS 15-44	Reject	298.97	8	0.01
(b) Females W/O HS vs. with HS 15-44	Reject	8S.57	4	0.01

Null Hypothesis III. Greater experience does not lead to an increase in primary jobs held by non-natives.

Comparisons	Results	Chi-square	d.f.	Level
1 (a) Males and Females with HS 15-24 vs. 25-44	Reject	231.05	8	0.01
(b) Males and Females with HS 15-24 VS. 25-44	Reject	154.80	4	0.01
2 (a) Males and Females without HS 15-24 vs. 25-44	Reject	450.52	8	0.01
(b) Males and Females without HS 15-24 vs. 25-44	Reject	244.26	4	0.01

Null Hypothesis IV. Increased education does not lead to an **increase** in primary jobs **held by nativea.**

Comparisons	Results	Chi-square	d.f.	Level
1 (a) Males W/O HS vs. with HS 15-44	Reject	101.49	8	0.01
(b) Males W/O HS vs. with HS 15-44	Reject	18.76	4	0.01
2 (a) Females W/O HS vs. with HS 15-44	Reject	1S9.60	8	0.01
(b) Females W/O HS vs. with HS 15-44	Reject	23.99	4	0.01

Null Hypothesis V. Greater experience does not lead to an increase in primary jobs held by natives.

Comparisons	Results	Chi-square	d.f.	Level
1 (a) Males and Females with HS 15-24 vs. 25-44	Reject	64.74	8	0.01
(b) Males and Females with HS 15-24 VS. 25-44	Reject	11.08	4	0.05
2 (a) Males and Females without HS 15-24 vs. 25-44	Reject	212.95	8	0.01
(b) Males and Females without HS 15-24 VS. 25-44	Reject	131.19	40.01	

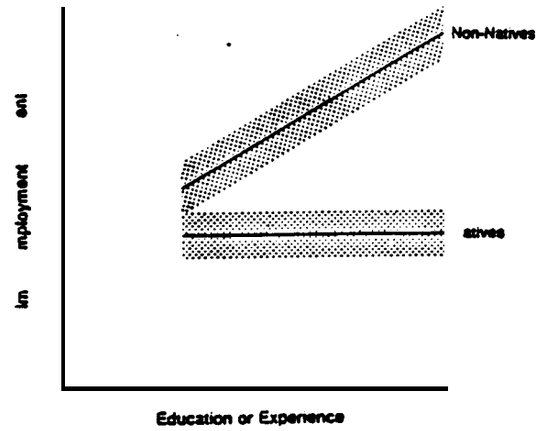

Figure 1 Hypothetical scatterplot-dual labor market theory

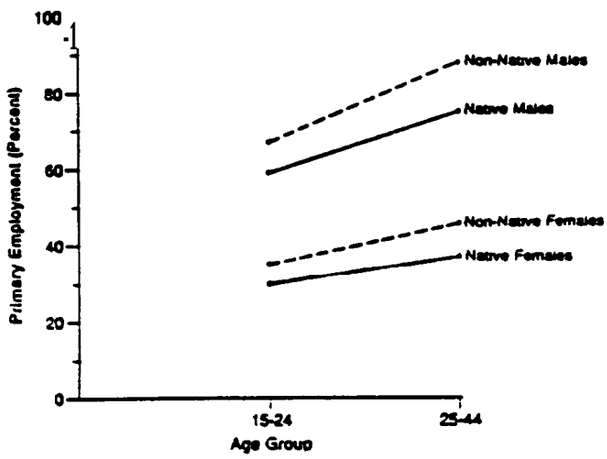

Figure 2 Percent employment of technical and high school graduates in primary jobs, by ethnicity, sex and age groups, NWT 1984

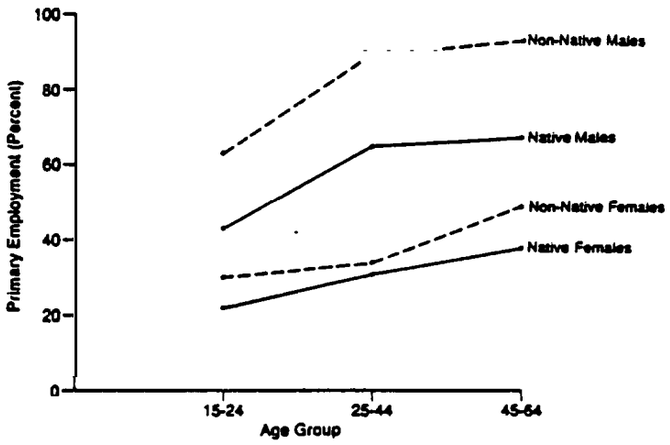

Figure 3 Percent employment of people with less than high school educations in primary jobs, by ethnicity, sex and age groups, NWT 1984

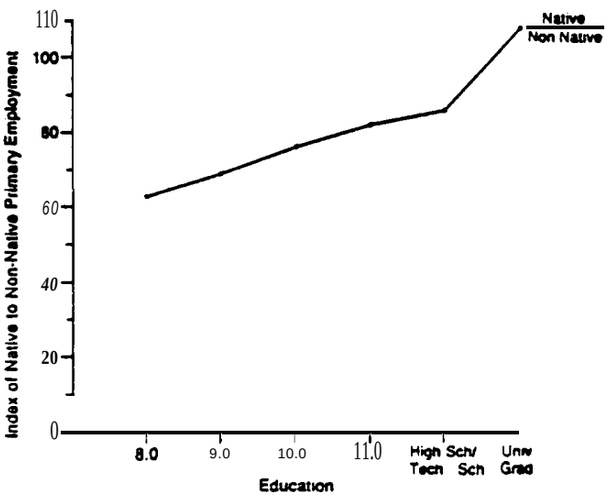

Figure 4 Index of male native m non-native primary employment, 2544 age group, by level of educational achievement, NWT 1984

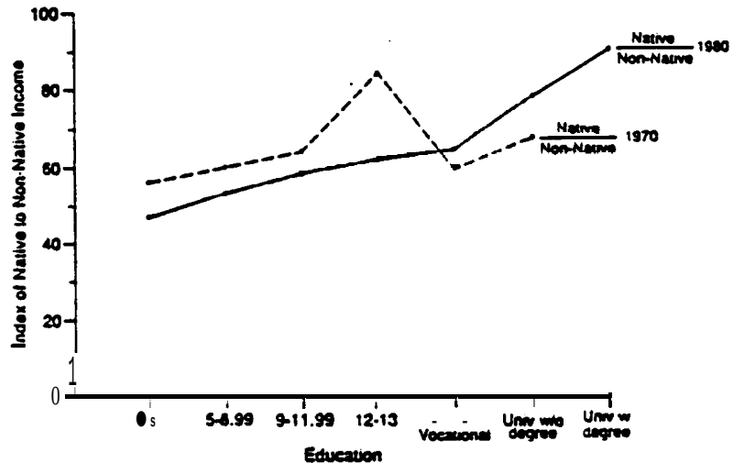

Figure 5 Index of incomes of employed native to employed non-native family heads, by level of education, NWT 1970 and 1980

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