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UNEMPLOYMENT TRANSITIONS AMONG BRAZILIANS IN THE U.S. AND CANADA

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INTRODUCTION

This study is part of a project designed to examine the labor force experiences of Brazilian immigrants to the United States and Canada. While the focus of this paper is on unemployment transitions, forthcoming analyses will examine job shifts and occupational mobility among these recent immigrants to North America.

Some believe unemployment to be "the central economic challenge of our times" (Sinclair, 1987, p. vii). Yet this topic remains somewhat neglected (Hujer and Schneider, 1990) both in the U.S. and abroad. This is especially unfortunate as unemployment represents an underutilization of labor and a failure of the economic system to efficiently use its scarce resources (Joll et al., 1983), and in some cases a tragic waste of people's lives. Although a great deal of debate exists concerning which theories and models best explain unemployment patterns and trends among the "general" population, there are nonetheless many such explanations from which to choose. However, when it comes to immigrant unemployment in North America and elsewhere, this aspect of their labor market experience is not very well understood (Sassen, 1995; Duleep and Wunnava, 1996). The goal of this study is to determine which theories and variables best explain the unemployment transitions of recent immigrants to the US and Canada by studying a new and rapidly growing group, the Brazilians.

WHY STUDY BRAZILIAN IMMIGRANTS TO NORTH AMERICA?

Brazilian immigration to North America continues to grow at a rapid pace. United States Department of Naturalization and Immigration statistics indicate that in fiscal year 1998 Brazil was the number six recipient of non-immigrant visas to the US as over 953,000 such visas were issued to Brazilian nationals (U.S. Dept. of State, 2000). Canadian statistics also reflect similar patterns of recent growth among that country's Brazilian population (EIC, 1993). Goza (1994) demonstrated that as recently as 25 years ago there were almost no Brazilians residing in North America. Today it is conservatively estimated that well over 200,000 Brazilians reside in the US and thousands more live in Canada (Goza, 1999). And, as mentioned above, these numbers continue to quickly increase.

Because of the recent nature of Brazilian immigration to the US and Canada (Goza and Simonik, 1992; Margolis, 1994), this movement is considered part of the newest wave of North American immigration. This flow is but one component of the rapidly growing "south-north" migration currently occurring in many parts of the globe. Very little is

known about the unemployment experiences of south-north migrants in general, and even less is known about the specific experiences of Brazilians in the North American workforce.

Recent studies (Goza, 1994, 1999; Margolis 1994) have indicated that although many Brazilian travelers will stay in North America only a very short time, there are others who will remain on a more permanent basis, regardless of the type of visa originally issued. Most of these individuals will opt to seek employment, and some among this group will eventually decide to permanently remain in North America. Many desire to provide a better life for families left behind. Others desire to save as much as possible for eventual investment purposes back in Brazil. Still others hope to remain permanently in either the US or Canada and to make investments in their newly adopted country. In all of these cases it is of fundamental importance that a worker find employment in order to earn and save the funds required for them to meet their economic goals. Because of similar tendencies among many other "new" immigrant groups to North America we expect that our results may also be generalizable to other immigrant populations, especially those that contain a large portion of undocumented individuals.

To date most studies of the labor force experiences of these new immigrants have been descriptive in nature (e.g., Margolis, 1994). However, this comparative study of Brazilian work experiences in the US and Canada will be different because the binational data sets we examine were collected almost simultaneously using very similar instruments. As such they both contain the same monthly employment and unemployment variables, something that will permit our analyses to move beyond pure description and to determine which factors are the most important in predicting the transition from unemployment to employment. Such factors are of extreme importance to the long-term economic well being of all labor force participants, but especially to economic migrants who often have few financial resources to sustain them during long periods of unemployment. Such monthly unemployment data also make it possible to employ *survival* or *event history analysis* as a means of determining those variables which best predict how long Brazilians will remain unemployed in the US or Canada. Given the tenor of current political debate, and the ever increasing number of foreign born residents throughout North America, this is an especially timely issue. Lastly, the examination of binational data sets makes it possible to compare and contrast predictors across North American countries.

Thus far Brazilians in the US and Canada seem to correspond to the general labor force patterns experienced by many earlier immigrants. That is, after a difficult initial period a slow process of adaptation begins, frequently leading to some upward occupational mobility. Despite these similarities, numerous differences do exist in the experiences of Brazilian workers in the US and Canada (Goza, 1994). First, more Canadian immigrants desired to permanently remain in North America while, more US immigrants were "target-earners" or people with a specific financial goal in mind who planned to return home once they saved enough money to satisfy their goals. Second, more Canadian residents utilized government social programs than did US inhabitants. Lastly, the majority of Brazilians in Canada had filed for refugee status (Goza, 1999), an option not open to those in the US. Given these rather different social environments, we

expect to observe significant differences in unemployment durations and predictors for these two countries.¹

REVIEW OF UNEMPLOYMENT LITERATURE

This study will primarily focus on three theoretical frameworks used to explain and predict unemployment. These theories are job search, human capital, and labor market segmentation. We believe all three frameworks can contribute to our understanding of unemployment transitions among immigrants. However, we also expect that a composite model that integrates ideas from all three, while also incorporating variables unique to the immigrant experience, might lead to the best model for explaining immigrant transitions from an unemployed to an employed state. Variables that fall into the latter category include number of relatives present in country of destination, ethnicity of employer, and predominant ethnicity of co-workers. Thus far these variables have largely gone untested because most data sets do not contain them. However, the data analyzed herein will permit us to examine the effects of these unique variables on the unemployment transitions of immigrants. Below we present a brief discussion of the three theories and develop specific hypotheses that will enable us to test various aspects of each framework.

Search theory, simply put, assumes that the expected completed duration of an unemployment spell will depend on two probabilities. These are the probability of receiving a job offer and the probability of accepting the offer (Lynch, 1989). Offers are extended to those who appear most desirable to an employer, while the probability that an offer is accepted is determined by the unemployed worker's minimal acceptable wage, or "reservation" wage. Offers coming in below the reservation wage will be turned down, while those equal to or above it will be accepted. This theory predicts that as the duration of unemployment increases one's reservation wage will fall, something predicted to lead to an increasing hazard of reemployment.

Job search theorists further suggest that the gathering of employment information is a costly undertaking. It also assumes that searching for a new job is impossible when one is employed. Accordingly, search theory tends to treat unemployment as a voluntary event, whereby a person opts to be unemployed in order to engage in a productive search for a better job (Sørensen, 1990). Certain conditions, such as the receipt of unemployment compensation or welfare, are assumed to enable one to survive longer periods of unemployment as their search continues. It is also assumed that those with alternative sources of income, such as married individuals with working spouses, the low-paid, and young single workers will tend to have longer unemployment spells, as their losses are relatively small and the knowledge they acquire through experimenting with

¹ Note, however, that the recent arrival of Brazilians to both countries makes it possible that all of our results will continue to evolve. As such, we suggest that the conclusions presented below be viewed as those of a baseline; i.e., a starting point for future analyses to be undertaken once this flow has become fully incorporated into the North American workforce.

different jobs is assumed to be beneficial to the maximization of their lifetime income stream.

Choice and luck are two important aspects of search theory. Choice because a worker is free to lower his or her reservation wage, which should reduce the unemployment duration, but as a consequence also lead to lower earnings. Luck because two identical workers could end up with unequal wage rates because of the dispersion of wage offers likely to be encountered at any time in a less than perfect world of information.

The job search situation of immigrants is unique to that of the host population because we expect to see substantially more job mobility occur among most if not all newcomers as they attempt to acquire more knowledge about the workings of the labor market in their new host society. Such moves are expected to be associated with periods of voluntary unemployment as they exit jobs to acquire this information. In most cases, however, we expect the completed durations to be relatively brief. Among the general population such job sampling is generally only witnessed among young workers (Joll et al., 1983). Immigrants and young workers are similar, however, in that both groups are initially unfamiliar with the employment options available. Numerous studies also demonstrate that immigrant job searches are greatly facilitated by ties to other co-ethnics, a relationship that will be examined in additional detail below. Similarly, we expect that the more familial contacts one has in their nation of residence the more access to information they will have. For this reason we will incorporate the variable "number of relatives present" as part of our job search theory model.

As mentioned above, in order for workers to accept a job offer, one first needs to be offered. Job search theory permits one to hypothesize that employers would screen workers based on their past unemployment histories. That is, we expect those with lengthy histories of prior unemployment and few skills to offer will be less likely to receive offers of employment.

Human capital theory posits that the type of position and the wages immigrants are able to obtain are essentially determined by the skills they possess. In other words, it is believed that unemployment results because of discrepancies between individual skills and the qualifications required. Although this model has been criticized for ignoring the macro or structural factors that affect immigrant employment and wages, it has shed light on the importance of individual level characteristics in the labor market. If we concentrate on workers residing in a clearly defined labor market, as is done in this study, human capital theory would predict that those with more specific skills or human capital, at any skill level, will have lower probabilities of leaving unemployment than others. Meanwhile, unskilled workers are expected to have shorter unemployment durations because their skills are more marketable and their training, recruitment and severance costs are lower for employers. In sum, the above arguments suggest that when confined to a given locale unemployment duration will be positively related to skill level.

Although human capital theory predicts when confined to a given locale those with more human capital will likely experience longer periods of unemployment, it also predicts that it is the unskilled who will experience the highest number of unemployment spells. This is expected because they are typically the least expensive to discharge when demand subsides and to rehire once it recovers (Joll et al., 1983). Because the recruitment and training costs of skilled workers are much higher than they are for the unskilled, it is

expected that those possessing the desired characteristics will be coveted employees. As such, human capital theory predicts that those who have had little time to acquire the necessary skills, the young, those most recently hired, and the unskilled, will account for the majority of the unemployment spells.

The two theories discussed above have emphasized either individual choice or individual attributes rather than the social structure or labor market context that conditions these choices (Sørensen, 1990). Segmentation theory takes into account the notion "that over time the labor market has become divided into self-contained segments composed of non-competing groups of workers" (Joll et al. 1983, p. 379). This position is in stark contrast to the neoclassical vision of the labor market, where it is assumed to be homogeneous.

Different segmentation theorists have given distinct names to the various sectors, but suffice it to say that most scholars agree that not all segments present the same opportunities to their participants. For example, Wilson and Portes (1981) divided the economy into three sectors, the primary, secondary and ethnic enclave. The primary sector labor market corresponds to the center economy and possesses the positive characteristics of stability, chances for promotion, high wages, and good working conditions. The secondary labor market consists of peripheral firms characterized by limited job security, few opportunities for advancement, low wages, and poor working conditions. In the enclave economy ethnic co-workers receive returns on their prior human capital investments which are higher than those of the secondary sector, and may even approach primary sector returns.

In the present paper we examine the effects of ethnicity of employer and predominant ethnicity of co-workers in an attempt to see if working with and/or for co-ethnics leads to shorter unemployment spells; something we hypothesize will occur based on the social network literature. These measures will give us some notion of the importance of the enclave hypothesis amongst Brazilians.

Currently no direct measures of the primary or secondary sectors will be analyzed. However, we will utilize the same technique used by Sørensen (1990) to distinguish between the primary and secondary sectors, which he refers to as closed and open segments, respectively. To do this the measures race and labor force experience in North America will be used as indicators of labor market experience. We assume that immigrants, just like minority members and inexperienced individuals, will more likely to be found in the secondary sector, especially when the immigrants are undocumented.

DATA, VARIABLES AND METHODOLOGY

The data analyzed in this paper come from independent samples collected in the US and Canada. The first was collected in August and September of 1990 and the second was collected during the same months of 1991. The US sample was collected in a medium sized city located in the northeastern region of the country which we will refer to as *Cidade Congelada*. We use this pseudonym because of the large number of undocumented individuals interviewed in that city. The Canadian sample was collected in the Toronto metropolitan region. In each sample approximately 200 people were interviewed. Each respondent provided information for numerous questions that covered a variety of topics. Included was an employment history matrix that recorded over 15

measures for every workforce position ever held in North America. For a more detailed description of this data see Goza (1994). Keifer (1988) has indicated that any careful evaluation of unemployment requires accurate data on the duration of unemployment. Because our employment history matrix compiled data on a monthly basis, we not only possess detailed data, but we are able to examine employment shifts with *event history* or *survival analysis* techniques.

The analyses presented in this paper are based on 620 unemployment spells of 186 Brazilian immigrants residing in the U.S. and 435 Brazilian immigrants residing in Canada. Spells are normally created by people leaving or being forced out of a job. They are terminated when people reenter the labor force. In the present analysis the period between time of arrival in North America and the initiation of one's first job was also considered as an unemployment spell. Because nearly 30% of these immigrants began their first job within 7 days of arriving we believe this is an appropriate modification. Forty-two censored spells (i.e., those in progress at the time of interview) comprise part of our sample. Completed unemployment spells vary considerably in length. Some lasted less than a week, while others continued for over a year. The median unemployment spell was one week, and the range was from 3 days to 60 months. Men and women respondents residing in both the U.S. and Canada were pooled together into one sample for the purposes of analysis.

Predictors. --

Table 1 presents a list of the variables to be included in our analyses examining transitions from an unemployed to an employed state. This table also indicates how these measures were defined. In addition, unemployment was defined such that a spell began any time an individual experienced a transition from an employed state to an unemployed state and was available and looking for work.

Table 1

Variable Name	Definition	Distribution
BRAZBRAZ	1 if co-workers and owner are Brazilian, 0 if otherwise	1= 6.1% 0= 93.9
BRAZCO	1 if co-workers are Brazilian, 0 if otherwise	1= 24.2% 0= 75.8
BRAZOWN	1 if owner is Brazilian, 0 if otherwise	1= 9.2% 0= 90.8
CANADA	1 if Canadian resident, 0 if otherwise (Contrast: Respondents residing in the U.S.)	1= 29.8% 0= 70.2
CENSOR	1 if uncensored, 0 if otherwise	1= 93.2% 0= 6.8
CHRTLT30	1 if age is less than 30 at beginning of unemployment period, 0 if otherwise	1= 69.0% 0= 31.0
EDUC8_10	1 if respondent has 8 to 10 years of education, 0 if otherwise	1= 28.9% 0= 71.1
EDUC11	1 if respondent has 11 years of education, 0 if otherwise	1= 49.2% 0= 50.8
EDUC12_15	1 if respondent has 12 to 15 years of education, 0 if otherwise	1= 15.2% 0= 84.8
EDUC15	1 if respondent has 15 or more years of education, 0 if otherwise.	1= 6.8% 0= 93.2
ENGLISH	1 if English speaking ability was self-reported as begin good, very good or fluent, 0 if otherwise	1= 63.5% 0= 36.5
FEMALES	1 if respondent was female, 0 if otherwise	1= 21.6% 0= 78.4
ILLEGAL	1 if respondent entered the country illegally and is still illegally residing in host country, 0 if otherwise	1= 14.8% 0= 85.2
ILL_LEG	1 if respondent entered the country illegally and is now legally residing in host country, 0 if otherwise	1= 25.0% 0= 75.0
KIDS	1 if respondent has children, 0 if otherwise	1= 45.0% 0= 55.0
LEG_ILL	1 if respondent entered the country legally and is now illegally residing in host country, 0 if otherwise.	1= 53.4% 0= 46.6
MARRIED	1 if respondent is married, 0 if otherwise	1= 35.6% 0= 64.4
TARGET	1 if respondent is target earner, 0 if otherwise	1= 64.5% 0= 35.5

Hypotheses.--

The section that follows will outline some of our key hypotheses as they correspond to the three theories discussed above. We then discuss variables to be examined that are unique to immigrants. Note, however, that some of the variables analyzed may correspond to one or more of the three theories discussed above.

Our presentation begins with a discussion of variables that test job search theory. As mentioned above, we expect to find significant contrasts across the two countries. The variable CANADA will monitor these differences in Models 2, 3 and 4. In addition, Model 4 will examine the effect of the interaction between the variable CANADA and the log of time unemployed. Because most Brazilian immigrants to Canada initiated refugee claimant proceedings, they were able to freely access many of the public services available there. Thus, we hypothesize that these alternative sources of income enabled them to endure longer periods of unemployment, an idea advanced by job search theory, than occurred among US residents who generally received no such aid. As such we expect to see a negative coefficient for Canadian residents in our models predicting transitions from an unemployed to an employed state.

The variable LASTWAGE, or wage at last job prior to unemployment, serves as a proxy for one's reservation wage. We expect to observe a positive duration coefficient as those with higher wages are expected to be more selective about the jobs they accept and to hold out for greater remuneration.

Measures monitoring prior employment (i.e., number of previous jobs, North American work experience and duration at last job) and unemployment experiences in North America (i.e., cumulative time unemployed) were earlier discussed as variables that employers could use to screen prospective employees. As such we expect that those demonstrating a great deal of instability and little work experience on this continent will likely be those individuals least likely to be hired. Thus we expect to observe longer durations of unemployment or positive duration coefficients for these measures.

Search theory also suggests that because of discrimination certain groups of workers will be denied job offers available to others. Our variables RACE and FEMALE will monitor this possibility. We expect that because of discrimination non-whites and women will experience longer durations of unemployment.

Also suggested by this theory is the notion that those with limited labor market experience, and hence the relatively young, will be less likely to be offered positions and more likely to encounter longer periods of unemployment duration. This negative relationship between age and unemployment has been well documented by numerous studies in economics and sociology (DiPrete, 1981). Still, the overall effect is likely to be somewhat curvilinear since the older one is, the longer it takes to become reemployed (Sinclair, 1987; Joll et al., 1983). We examined the pattern of coefficients for age and determined that the effect was stronger for ages less than 30. Therefore for reasons of parsimony we opted to dichotomize this as a dummy variable with two categories, those less than 30 and those 30 and older. These categories will be used in the models presented below.

The last measure to be examined that is frequently included in job search theory models is EDUCATION. Since higher levels of education generally make workers more

attractive to prospective employers, we expect this measure to be associated with negative duration coefficients.

In an attempt to fine tune the job search theory model to more accurately depict the immigrant reality we also examine the variable RELAHERE (i.e., the number of relatives present in the country of destination). We hypothesize that immigrants with large numbers of relatives present, regardless of country of residence, will have access to more and better quality information about employment possibilities than those with no familial contacts present. As such, we expect these individuals to experience shorter periods of unemployment as they presumably have easier access to the information needed to make the transition to employment.

To test the human capital model we will examine several variables commonly included in such models. These include: age, education, marital status, and North American workforce experience. Our hypotheses include those generally advanced for these measures and discussed above. The only variable that warrants additional discussion is marital status (MARSTAT). We hypothesize, as generally done by human capital theorists, that those married will demonstrate a greater attachment to the labor market and experience shorter unemployment spells.

In the present analyses segmentation theory is examined only indirectly with several of the variables already discussed. These are AGE, RACE, and EXPERIENCE in North America. Like Sørensen (1990), we expect that younger workers, non-whites and those with limited labor force experience will be confined to the secondary sector of the labor market. Thus we expect to see positive duration coefficients for non-whites, and negative relationships for AGE and EXPERIENCE.

Several variables will also be examined that are unique to immigrants. Already discussed was the variable RELAHERE. We also examine the variable TARGET EARNER. Because these individuals attempt to save as much money as possible, as quickly as possible, we expect them to make the transition to an employed state as soon as possible.

The related variable REMIT monitors the effect of sending remittances to Brazil on transition duration. Many times, but not always, those who remit are supporting family members left behind. Because of this need for continuous income we hypothesize that those who remit will also experience shorter periods of unemployment.

Two self-reported measures of English ability are also examined. These are English ability at time of arrival and current English ability. These important human capital skills are expected to be negatively related to unemployment durations.

The final variable we examine which is unique to immigrants is legal status. Because of the tenuous nature of those present without proper documentation, we expect that they will encounter more difficulties locating employment than those legally in North America, *ceteris paribus*.

STATISTICAL ANALYSIS

Initial explorations of bivariate relationships between the categorical predictors and the duration of unemployment were conducted by plotting estimates of the survival function, stratified by the levels of the predictor (the strata). If \underline{T} represents the duration of unemployment in months, then the survival function is $P(\underline{T} > \underline{t})$, the probability that a

given individual remains unemployed until at least time t . For example, if t is 3 months, then the survival function at three months, $S(3)$, is the probability that a worker is unemployed for at least 3 months. The units of analysis were unemployment spells pooled across individuals in the data set. A total of 620 unemployment spells were available.

For this analysis, estimates of the survival function were calculated using the life-table method (Blossfeld, Hamerle, & Mayer, 1989). In the presence of many tied durations, as was characteristic of our data (see below), the life table approach is more efficient and robust than other nonparametric approaches, such as the Kaplan-Meier estimator (Blossfeld, Hamerle, & Mayer, 1989). The range of duration of unemployment in the current sample was .03 months to 60 months, with a median duration of one month. In the plots, the duration of unemployment in months was grouped into the following intervals: [0 - .2), [.2 - .4), [.4 - .6), [.6 - .8), [.8 - 1), [1 - 2), [2 - 4), [4 - 6), [6 - 8), and [8 - 60] months.

The survival functions for different strata (levels) of a predictor are homogeneous whenever different strata are characterized by the same survival function. In this case, there is no relationship between a given predictor and the hazard of the event of interest. The assumption of homogeneity of the survivor function across strata was tested with the log-rank and Wilcoxon statistics provided by the procedure LIFETEST in SAS. Under the null hypothesis that the survivor functions are the same across levels (strata) of a grouping variable, both statistics are asymptotically chi-squared with degrees of freedom equal to the number of strata minus 1 (Kalbfleish and Prentice, 1980). Both tests were examined, in that the Wilcoxon test stresses the difference in survivor functions early on in the process under study, and the log-rank statistic stresses differences at the end of the process. If either test was significant, the survivor functions were deemed significantly heterogeneous.

Multivariate analysis was conducted using the hazard of reemployment as the response. Once again, if T represents the duration of unemployment for any given unemployment spell, then the hazard of reemployment at time t is defined as

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{P(t \leq T < t + \Delta t | T \geq t)}{\Delta t}$$

That is, the hazard at time t is the instantaneous rate of reemployment at time t (that is, the duration of unemployment is exactly equal to t), given that reemployment has not occurred prior to that time. The model to be used for $h(t)$ depends upon the distribution of the random variable T . If T is characterized by a known distribution, then a parametric model can be used, along with maximum likelihood estimation of model parameters. If not, the most popular alternative is to use Cox's semi-parametric model, which utilizes a partial likelihood estimation technique.

To explore whether the distribution of unemployment duration might follow a parametric form, we employed a graphic method suggested by Blossfeld, Hamerle, and Mayer (1989). We plotted various functions of the estimated survivor function (based on the life-table method) for the entire sample against various functions of unemployment duration. If any of the plots are characterized by a straight-line trend, a particular parametric distribution of time is suggested.

For example, let $S(t)$ denote the survivor function for the population of interest. Then, if, for example, T is characterized by an exponential distribution, a plot of $-\ln(S(t))$ against t should be linear. This follows because if T is exponentially distributed, $S(t) = \exp(-\lambda t)$, where $\lambda > 0$ is a constant. Taking logs of both sides of this equation, we see that $\ln(S(t)) = -\lambda t$, or $-\ln(S(t)) = \lambda t$, an expression that is linear in t . Similarly, for a Weibull distribution to be supported, a plot of $\ln(-\ln(S(t)))$ against $\ln(t)$ should be linear. A plot of $S(t)/S(t+1)$ against t should be linear if a Gompertz distribution characterizes the data. And a plot of $\ln((1-S(t))/S(t))$ against $\ln(t)$ should be linear if a log-logistic distribution is valid for T . Because graphical methods are somewhat inexact, we tested for nonlinearities in the plots in each case by regressing the function of $S(t)$ on the function of t and including a quadratic term to capture nonlinearity. Tests for the exponential and log-logistic distributions each revealed significant nonlinear as well as linear effects, while the test for a Gompertz distribution resulted in no significant trends. The test for a Weibull distribution revealed only a significant linear trend. We concluded that a Weibull distribution was the most reasonable parametric form for unemployment duration.

Ideally, we would have liked to have estimated a Weibull model using a continuous-time specification. However, the distribution of unemployment duration in our data was characterized by too many tied event times for a continuous-time model to be advisable. (For example, about 34 percent of the unemployment spells ended after exactly one month.) When there are many ties in the data, continuous-time models eventuate in parameter estimates and standard errors that are biased (Blossfeld, Hamerle, & Mayer, 1989). Instead, we used a discrete-time approximation to a hazard model in the following manner. In that time is to be specified according to discrete intervals, we let $h(t)$ denote the probability that an individual is reemployed in the t th interval, given that he or she has not experienced reemployment prior to that interval. We then employ the complementary log-log function to model $h(t)$ as a linear function of the covariate set:

$$\log(-\log(1 - h(t))) = \mathbf{a}_t + \sum \mathbf{b}_k X_k$$

This specification is especially attractive because when the data are really generated by a continuous-time model--as they are in this case--discrete-time estimates obtained through this specification are also estimates of the underlying continuous-time model (Allison, 1982). To approximate the Weibull model, we further allowed α_t to equal $\alpha_0 + \alpha_1 \log t$ by including the log of unemployment duration as a covariate in the model (see also Sørensen, 1990, for an illustration of this technique). The intervals used for unemployment duration were less than one month, 1-2 months, 2-4 months, 4-6 months, and more than 6 months.

Because unemployment is a repeatable event, many of our respondents contributed multiple unemployment episodes to the data. The analysis of multiepisode data assumes that individual spells are conditionally independent, given covariates representing an individual's event history. Such covariates typically describe factors that would make individuals more or less prone to experience repeated events in succession. In this analysis, therefore, all models control for cumulative unemployment duration in months, cumulative employment duration in months, the number of previous jobs held in North America, total time in North America in years, and the duration of the last job in

months. All of these factors refer to the beginning of the current unemployment episode. Additionally, the variable education was collapsed into several categories prior to its inclusion as a predictor. In preliminary analyses it was discovered that the effect of education was not linear and was additionally only poorly captured by a quadratic term. Therefore education was entered into the model as four dummies representing 8 to 10 complete years of schooling, exactly 11 years of schooling, 12-14 complete years of schooling, and 15 or more years of schooling. Less than 8 years of schooling was the reference category.

In the analyses that follow four different discrete-time approximations to the Weibull model will be presented. In the first we examine a subset of labor force measures. In the second a subset of demographic and sociological variables are added. In the third we examine several variables related to the importance of ethnic networks and the fourth, or full model, includes the interaction effect of Canadian residence and time unemployed.

RESULTS

Analytical Results.--

Table 2 presents the results of our discrete-time approximation hazard models. This table contains parameter estimates and associated statistics that will allow us to compare our various models. Note that many variables which were theoretically important (e.g., RACE, REMIT and current English ability) failed to ever achieve statistical significance. These variables are excluded from the models presented in Table 2.

Table 2
Discrete-Time Approximations to the Weibull Models for Hazard of Re-Employment for Brazilian Immigrants in U.S. and Canada

Independent Variable	Model 1	Model 2	Model 3	Model 4
Intercept	-1.1630	-1.1100	-1.2260	-1.5974
Cumulative Unemployment	-.0160	-.0043	-.00704	-.00273
Cumulative Duration on Job	.0065	.00874	.00865	.01030
Months in North America	-.0810	-.1427	-.13700	-.16020
Number of Previous Jobs	.02480	.0052	.01080	.01360
Log of Time	1.0355 ****	1.1935 ****	1.2088 ****	1.71980 ****
Duration on Last Job	-.0240 **	-.0309 **	-.03170 ***	-.03050 **
Monthly Income at Last Job	.0000	.0000	.000034	.000036
Female		-.3410 **	-.33940 **	-.32270 **
Children Present		-.1178	-.09840	-.09230
Married		-.0888	-.10960	-.12090
Number of Relatives in NA.		.0142	.01660	.01930
Age < 30 at Time of Unemployment		.1970	.22620 *	.22380 *
Education				
8 to 10 Years		.1687	.17540	.18710
11 Years		.2281	.21700	.22380
12 to 14 Years		.5567 ***	.59680 ****	.60500 ****
>= 15 Years		.1145	.11490	.12480
English Ability at Arrival:				
Good, Very Good or Fluent		-.5434 **	-.53300 **	-.48680 *
Living in Canada		-.0946	-.05140	.40640 *
Target Earner		.3200 ***	.29740 **	.29950 **
Entered Illegally, Presently Illegal		-.5648 **	-.63560 **	-.60660 **
Entered Legally, Presently Illegal		-.4065 *	-.41660 *	-.38630 *
Entered Illegally, Presently Legal		-.4975 **	-.49140 *	-.50120 **
Brazilian Owner at Last Job			-.12620	-.15760
Brazilian Coworkers at Last Job			.29980 *	.30960 *
Brazilian Coworkers and Owners			.02490	.00315
Canada * Log of Time				-.69240 **
χ^2	169.637 ****	231.914 ****	238.538 ****	250.357 ****
df	7	22	25	26
? $\chi^2(df)$		62.277(15) ****	6.624(3)	11.819(1) ***

*p<=.05, **p<=.01, ***p<=.001, ****p<=.0001

Model one represents the baseline model that includes only labor force measures. This model was highly significant at $p < .0001$. Of the variables included, however, only the log of time (i.e., the unemployment duration) and duration of last job prior to the unemployment spell were significant. The positive coefficient for log of time indicates, not surprisingly, that the longer individuals are unemployed the more likely they are to become reemployed. The coefficient for duration of last job prior to unemployment is negative, meaning that the longer individuals were at their prior position the longer the spell of unemployment. This outcome suggests that the more time people put into a given position the more specific are the job skills they acquire. Such specialized training may not be easily transferred to other positions, a possibility supported by the negative hazard for exiting unemployment. Although the variable monthly income at last job was intended to directly test the effect of one's reservation wage it failed to ever attain statistical significance. However, the variable duration of last job prior to unemployment might serve as an indirect measure of reservation wage since presumably the longer people are at the same job the more they will to earn. Should this be the case, then these results do conform to job search theory expectations as those earning more (i.e., those on the job longer) are less likely to exit unemployment--presumably because they are awaiting better offers. In all three of the models that follow the variables log of unemployment duration and the duration of last job retain their statistical significance in the same directions. Surprisingly none of the other experience variables (cumulative unemployment, total months in North America, and number of previous jobs) ever attained statistical significance in any of the models.

Model 2 builds on model 1 by including various demographic and sociological variables. Several of these measures were statistically significant as this model resulted in a significant improvement over model 1 ($p < .0001$). Among the core demographic variables included in this model only FEMALE attained statistical significance as women experienced much longer unemployment spells than men. This result also conforms to job search theory which posits that for numerous reasons (e.g., discrimination) women are prevented from accessing the information needed to locate employment or from being offered a position. The significant effect of the variable FEMALE also remains in the next two models.

Another socio-economic measure to attain significance in model 2 was 12 to 14 years of completed education (i.e., the completion of high school to several years of college). People with this amount of education experienced significantly shorter unemployment spells than did the comparison group, those with less than 8 years of education ($p < .001$). Note, however, that those with 15 or more years of education did not significantly differ from the comparison group. This finding suggests two important conclusions. First, the training of relatively skilled immigrants is not always readily transferable. Second, those with some advanced education and skills that are perhaps less specialized are likely to experience shorter unemployment durations than those arriving with advanced degrees. These education results also remain significant in the two following models.

Our examination of the relationship between one's English speaking ability and unemployment duration revealed some rather unexpected results. As mentioned above, the variable current English ability was never significant and is not presented. On the other hand, the variable English speaking ability at time of arrival was always modestly

significant, although in the opposite direction hypothesized. Common sense and human capital theory predict that those who speak English the best should experience the shortest unemployment spells. This was not the case. Instead, those speaking English the best at time of arrival were significantly less likely to terminate an unemployment spell than were those speaking English poorly. This result might be due to the fact that this was a self-reported score rather than an objective test of English fluency. Hence there may be measurement error in this variable that biases the estimate of its effect. Another possibility is that this measure is also related to one's reservation wage as those with more fluency in English might be reluctant to take the first job offer presented and instead hold out for a more highly remunerated position; something that would again support job search theory. At any rate this rather puzzling result warrants additional analyses, especially as this negative and significant result is also found in the next two models.

The variable TARGET EARNER, a measure unique to the immigrant experience, was very significant in the predicted direction. Target earners, workers who indicated they planned to return to Brazil after achieving their financial goals, experienced significantly shorter unemployment spells than those desiring to remain permanently in North America. Since time is of the essence to such individuals it is not a surprising result that they would find employment more quickly. The statistical significance of this variable remains in models 3 and 4.

Model 2 had three other measures that reached statistical significance. All three are dummy variables that examine the legal status of immigrants. The comparison group was those immigrants who were always legal residents of North America. Not surprisingly all three comparison groups (see Table 1) experienced significantly longer unemployment spells. For example, those who never possessed legal documentation represented the group least likely to exit the unemployed state. Results are also significant in the predicted direction for the two other groups (i.e., those who entered without documentation and eventually acquired it and those who arrived with the proper documentation but then became undocumented).

Model 3 adds measures used in an attempt to examine segmentation theory. These variables monitor the effects of the predominant ethnicity of coworkers and the ethnicity of one's employer. More specifically, each variable was set up as a dummy measure such that those working either for a Brazilian employer or predominantly with Brazilian co-workers received a code of 1. All other cases were assigned a code of 0. Model 3, which includes measures of employment within the ethnic enclave, did not result in an improvement over model 2. However, one of these three variables was significant. The dummy variable monitoring whether or not one's coworkers at their last job were primarily Brazilians indicates that those who worked amongst other Brazilians experienced shorter unemployment spells. However, working for a Brazilian owner or in a situation where both the owner and coworkers were primarily Brazilian did not attain significance. Hence we can infer that while Brazilian owners do little to enhance the employment opportunities of their compatriots, links to co-ethnics through the workforce and elsewhere can be beneficial to immigrants' transitions out of unemployment. This result is not surprising given the numerous recent studies which document the importance of ethnic networks in helping immigrants become established. Apparently one important way to become part of this network of information sharing is to work with one's co-ethnics. When viewed in this context this measure could also be perceived as appropriate

for inclusion under the rubric of job search theory, something that has not yet been done elsewhere. This variable is also statistically significant in the final model.

Model 4, our complete model, adds only one interaction term to the variables contained in model 3. The added interaction term monitors the joint effect of Canadian residence and duration of unemployment (shown as log of time in the tables). This addition does result in a significant improvement over model 3 ($p < .001$). The partial slope for the effect of the log of time is $1.72 - .69 * \text{CANADA}$. This means that the impact of the log of time on the hazard of reemployment is more positive in the United States than in Canada. In other words, although the general trend is for individuals to have a greater rate of reemployment as time passes, this effect was stronger in the U. S. than in Canada. Possible explanations for this result are that Brazilians in Canada had more opportunities to partake of a generous social welfare system and/or labor union benefits than did those residing in the United States. These possibilities enabled the Canadian residents to be more discriminating when selecting new labor force positions. All other variables in Model 4 retained their earlier levels of significance as discussed above.

CONCLUSIONS

This study is an attempt to move beyond purely descriptive remarks about the unemployment experiences of Brazilians in the North American labor force. Accordingly, we have provided detailed statistical analyses of those predictors that best explain unemployment transitions among Brazilians in the US and Canada. After examining numerous variables, some of which correspond to job search, human capital and labor market segmentation theories, and some of which were introduced to reflect the uniqueness of recent immigrant populations, we conclude that a composite model is the most applicable for explaining the transition of immigrants from an unemployed to an employed state. Although some theories had more predictive power than others, each of the above theories was found to be at least somewhat effective in explaining the observed transitions.

Of the theories reviewed, job search theory was the most applicable for these immigrants. The variables that enable us to monitor access to information seemed to confirm to the expectations of this theory. Women did not do as well as men and people working primarily with other Brazilians exited unemployment more quickly than those who primarily worked with people of other ethnicities. Still, the number of relatives present in country of destination, something that should also affect access to information, had no effect. Although one's reservation wage did not conform completely as expected (e.g., monthly income at last job had no effect), duration at last job and English ability were statistically significant in the directions hypothesized by the reservation wage concept.

Human capital theory was of limited value in predicting transitions from an unemployed to an employed state among this immigrant population. Perhaps the relative failure of this theory has to do with the transferability of skills. Numerous studies have revealed how difficult this can be for international migrants, something that can negate the value of their formal training and English ability. Still, the fact that those with 12 to 14 years of completed education did significantly better than the comparison group serves to highlight the value of human capital.

Although segmentation theory was only indirectly evaluated, it seems to have the potential to warrant continued explorations. For example, those who worked primarily with other Brazilians experienced shorter unemployment spells than the comparison group. This finding lends support to the notion of ethnic networks and perhaps even the ethnic enclave hypothesis. Still, results for those variables examined herein were generally weak, and as mentioned before, more work needs to be done in this area.

The variables considered unique to the immigrant experience that we added to these analyses were frequently significant. Although variables like RELAHERE and REMIT were insignificant predictors, others like TARGET EARNER and LEGAL STATUS produced highly significant results in the predicted directions. Such findings serve to highlight the need to treat immigrants as a population distinct from those currently living where they were born and raised.

Finally, this study also attempted to determine whether the predictors of immigrant unemployment transitions were different in the US and Canada. For the most part all variables examined had similar effects regardless of country of residence. However, the interaction term introduced in model 4 that monitored Canadian residence and log of duration unemployed generated a statistically significant result, one that demonstrated that immigrants in Canada were more likely to endure longer periods of unemployment. This result conformed to expectations. We believe this is because in Canada, regardless of legal status, immigrants had greater access to public services.

In sum, this study has revealed several important findings about the nature of unemployment transitions among Brazilians working in North America. It is possible that these findings will also be generalizable to other new groups of North American immigrants. As such, we believe these findings represent an important baseline study for future investigations into this topic. Still, given the relatively recent arrival of these individuals, it is possible that the patterns documented here will continue to evolve in directions that are impossible to accurately predict.

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