A Longitudinal Study of Welfare Exit among American Indian Families

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Data from a longitudinal survey of families from three reservations (Navajo Nation, San Carlos, and Salt River) in Arizona were used to examine their probability of welfare use. Logistic regression models were used to estimate the effects of individual, family, and structural factors on welfare exit. Results indicate that their probability of welfare exit depended largely on economic opportunities on or near their reservations. Respondents from reservations with better employment opportunities were more likely to exit welfare than those who lived in more geographically isolated reservations with a high jobless rate. Other factors, including human capital, assets ownership, marriage, and two-parent family formation, which are known to contribute to welfare exit at the national level, did not have a similar effect on welfare recipients on reservations. Implications of findings are discussed.

KEY WORDS: *American Indian reservations; welfare exit; welfare reform*

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA; P. L. 104–193) of 1996 replaced Aid to Families with Dependent Children (AFDC) with Temporary Assistance for Needy Families (TANF), ending cash assistance to individuals as a federal entitlement and instituting time limits and work requirements for adult welfare recipients. Section 412, Title 1, of PRWORA authorized direct federal funding to tribes that submit their TANF administration plans to the U.S. Department of Health and Human Services (HHS). Since the passage of the PRWORA, many low-income single mothers, particularly urban and suburban women with better health, education, and job experience and with fewer, older, and healthier children, have found jobs and have exited welfare (see, for example, Acs & Loprest, 2003; Moffitt, Cherlin, Burton, King, & Roff, 2002; Rangarajan & Wood, 2000). Not much is known, however, about the welfare exit patterns among the reservation-based single mothers. To understand the factors that contribute to welfare exit among families on Indian reservations, we conducted a longitudinal survey of families living on reservations in Arizona. Specifically, we address the following questions: What are the characteristics of reservation-based welfare recipients? Are current welfare recipients different from former welfare recipients? Is there a significant relationship between respondents' welfare status in 1998 (wave 1) and their welfare status after four years (wave 2)? What factors—individual, family, human capital, assets, structural—influence the odds of welfare exit of families on reservations?

According to PRWORA, able-bodied, working-age individuals with children may receive cash assistance for a maximum of five cumulative years in their lifetimes (or less at state or tribal option) and must engage in employment after two years of receiving assistance. The states must have placed 50% of single parents receiving cash assistance in work programs for at least 30 hours per week (or 20 hours per week for single parents with a child younger than age six) by 2002. States may exempt up to 20% of their caseloads from the five-year lifetime benefit limitation in addition to exempting all American Indians residing on reservations with at least 1,000 individuals and with 50% or higher unemployment rates. The requirement of 1,000 people in residence on a reservation to qualify for exemption was subsequently eliminated, exempting adults residing on reservations of any size with at least 50% jobless rates from the five-year lifetime limit.

Most of the literature on welfare exits has focused on individual and family characteristics, including race, age, marital status, health status, education, employment experience, the number and age of

children, and presence of a disabled family member in the household. Among these factors, race, education, employment experience, and the number and age of children in the household are consistently related to the probability of welfare exits (see, for example, Fitzgerald, 1992, 1995; Olson & Pavetti, 1996; O'Neill, Bassi, & Wolf, 1987; Petersen, 1995; Rank & Hirschl, 1988) Moreover, those who stay on welfare longer often have additional barriers including learning disabilities, physical or mental health problems, or a disabled family member living in the household (Hagen, 1999; Loprest, 2002; Mofitt et al., 2002; Rangarajan & Wood, 2000; Urban Institute, 2005). The effects of age and marital status on welfare exit, however, are mixed. For example, some studies indicated that younger and unmarried recipients stay on welfare longer (Blank, 1989; Blank & Ruggles, 1996; Ellwood, 1986; Sandefur & Cook, 1998); in other studies these factors were unrelated to the welfare exits (Olson & Pavetti; Petersen). According to Porterfield (1998), marriage was the primary mode of welfare exit until the 1980s; since the 1990s, however, employment is the primary mode of welfare exit.

In addition to these individual-level factors, some studies also examined the effect of structural factors, such as regional employment rates, on welfare exit (Fitzgerald, 1995; Hoynes, 1996; Taylor, 1999). Welfare reform occurred in the midst of strong economic growth, and the national unemployment rate remained less than 6% between 1995 and 2002. Not surprisingly, employment was the most common reason for leaving welfare (Loprest, 1999). Historically, local labor market conditions (for example, unemployment rates as well as employment and wage growth) and geographic isolation of low-income populations from jobs had a significant influence on welfare spells and rates of welfare exits (Hoynes; Kasarda, 1989; Wilson, 1987). Other barriers to work include lack of child care, transportation, and job assistance (Swartz et al., 1999).

These structural problems are often magnified on Indian reservations. Compared with urban areas, many reservations have higher poverty, unemployment, and underemployment rates; lower population densities, earnings, availability of child care services; and longer distances to jobs (U.S. General Accounting Office [GAO], 1997, 1998). In 1995, the jobless rates for nine American Indian tribes in Arizona were between 50% and 90% (Stromwall, Brzuzy, Sharp, & Andersen, 1998). Moreover, the barriers to work

on reservations include not only a severe lack of job opportunities, but also a lack of child care and transportation (Pandey, Brown, Scheular-Whitaker, & Collier-Tenison, 2002; Pandey, Brown, et al., 2004; Pandey, Zhan, & Collier-Tenison, 2004). Hence, welfare reform may be working differently for the nation's reservation-based poor families.

WELFARE REFORM AND RESERVATIONS IN ARIZONA

The federal government required that all states implement the 1996 welfare law by July 1, 1997. Arizona obtained a waiver and implemented its version of welfare reform, the EMPOWER (Employing and Moving People Off Welfare and Encouraging Responsibility) program, on November 1, 1995. By 1997, Arizona also provided state maintenance of efforts funds to tribes that received an approval from HHS to administer their TANF plans. Arizona used 1995, 1997, and 1999 Bureau of Indian Affair (BIA) labor statistics, which are higher than U.S. Department of Labor unemployment statistics, to waive time limits for adults residing on reservations with at least 50% unemployment rates (for example, Navajo Nation and San Carlos) but required that they meet other aspects of the welfare law, including work compliance (Pandey et al., 2002; Pandey, Brown, et al., 2004). To calculate the jobless rate, BIA uses all working-age populations within a reservation irrespective of whether individuals are actively looking for a job. Also, if the adult jobless rate fell below 50% on these reservations in any year, the five-year lifetime limit would take effect.

Reservations in Arizona differ in size, geographic isolation, availability of economic opportunities, and levels of welfare dependency (Pandey, Brown, et al., 2004). A closer examination of the three tribes—Salt River, San Carlos, and Navajo Nation—included in this study sheds some light on tribal differences. San Carlos and Navajo are geographically isolated, whereas Salt River is situated in the suburbs of Phoenix and is one of the largest sand and gravel producers in the United States. San Carlos has a gaming industry.

A much higher proportion of children younger than age 18 is growing up in single-parent families on all three Indian reservations compared with the national statistics (see Table 1). This situation has become more pronounced over time. On all three reservations, the number of two-parent families with children age 18 and younger declined between 1990

Table 1: Comparison of the Three Reservations in Arizona, 1990 and 2000

	Reservation						State Total		U.S. Total	
	Salt River		Navajo		San Carlos					
Variables	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Demographics and educational attainment										
Population (1990 census)	4,856	6,403	148,658	180,462	7,239	9,385	3,665,228	5,130,632	248,709,873	281,421,906
% Native American	73	52.6	96.5	96.4	97.5	95.1	5.6	4.9		0.87
% people younger than age 18 with two parents	41.8	34.8	57.4	54.9	58.9	46.9	70.6	70.8	71.8	71.8
Of people 25 and older, % high school graduate or higher	52.9	64.4	41.1	55.9	49.4	57.6	78.7	81.0	75.2	80.4
Of people 25 and older, % bachelor's degree or higher	1.4	4.9	3.0	7.3	2	2.8	20.3	23.5	20.3	24.4
Poverty										
% in poverty all ages	52.7	30.5	57.8	42.9	62.5	50.8	15.7	13.9	13.1	12.4
% in poverty age 18 or younger	58.6	36.8	59.8	46.5	63.2	54.9	22.0	18.9	18.3	16.3
% of families below poverty level	50.5	27.4	55.4	40.1	59.8	48.2	11.4	9.9	10.0	9.2
Income (in dollars)										
Median household income	16,655	24,975	12,702	20,005	11,232	16,894	37,002	40,558	40,382	41,994
Per capita income	5,663	9,592	5,018	7,269	4,263	5,200	18,086	20,275	19,374	21,587
Median income of females who work full time	19,346	25,020	19,071	21,383	18,971	20,773	25,495	27,570	26,294	28,135
Median income of female householder, no husband present, own child younger than 18	6,718	18,281	8,068	13,595	7,165	8,243	18,232	21,517	16,774	20,284
Labor force										
% female 16 and older in labor force	52.4	45.4	38.0	40.6	29.4	42.7	54.8	54.3	56.8	57.5
% female in labor force with own children younger than six	61.2	58.3	47.2	45.6	32.0	37.4	60.2	58.0	61.3	63.5
% people worked 35 hours or more in refer. week	74.3	82.3	80.1	88.8	83.5	84.8	78.6	79.9	78.3	79.0
% females worked 35 hours or more in refer. week	73	80.4	77.6	81.8	81.3	82.4	71.3	72.7	69.4	71.0
% unemployed U.S. census (% not employed, BIA)	17.3 (28)	4.5 (25)	29.5 (52)	11.2 (34)	31.0 (58)	16.4 (53)	7.1	5.6	6.2	5.7

Notes: BIA = Bureau of Indian Affairs. Information on Navajo Nation includes entire Navajo reservation and Trust Lands in Utah, New Mexico, and Arizona. On Arizona portion of Navajo Nation, the total population in 1990 was 90,763, with 87,502 (96.4%) Native Americans. For comparison purposes 1989 income values have been adjusted to 1999 constant dollars by dividing 1989 dollar values by the deflator factor of 0.744298.

Sources: U.S. Census Bureau. (1990, 2000). Social and economic characteristics: American Indian and Alaskan Native areas. Washington, DC: Author; Bureau of Indian Affairs. (1995). Indian labor force report. Washington, DC: U.S. Department of the Interior.

and 2000. Salt River in particular has the lowest amount (35%) of all children living with two parents. Although all three tribes improved their educational attainment between 1990 and 2000, they lagged far behind compared with national figures. Salt River has the highest percentage of people 25 years and older with at least a high school degree. Although the three reservations are economically better off today than a decade earlier and their median household income and per capita income grew while the poverty rate dropped, median incomes on these reservations are distressingly lower than the comparable statistics at the state or national level (Table 1). Also, the three tribes continue to experience a very high poverty rate. Among the three tribes, the poverty rate is the lowest on Salt River (30.5%).

Overall, labor force participation of men and women on reservations is lower than state or national labor force participation. However, on all three reservations, the percentage of men and women who worked at least 35 hours per week rose between 1990 and 2000, and these figures exceeded the state or national labor statistics. The unemployment rate dropped on all reservations and nationally between 1990 and 2000; this figure was low on the Salt River reservation (4.5%) but remained high on Navajo (11.2%) and San Carlos (16.4%).

In terms of welfare dependency, as of June 1998, there were 153 cases (or families) on Salt River, 572 cases on San Carlos, and 3,718 cases on the Arizona portion of Navajo Nation. Caseloads of these three tribes amounted to approximately 71% of all reservation-based cases in Arizona. Also, Navajo Nation is the largest reservation-based tribe in the United States.

Welfare reform implementation strategies varied by tribes. Salt River began self-administering its TANF programs on June 1, 1999. This reservation aimed to maintain the 60-month lifetime limit, attain 25% work participation rate by 2001, and require single parents to work 20 hours per week and two-parent families to work 40 hours per week. Navajo Nation began self-administering its TANF programs on October 1, 2000. This reservation also maintained a 60-month lifetime limit (if the jobless rate fell below the 50% mark) and aimed at placing 20% of recipients to work a minimum of 20 hours per week. Arizona continued to administer the TANF programs on San Carlos.

By the end of the 1990s, the number of TANF recipients had dropped dramatically both nationally and at the state level (HHS, 2000, 2002). Welfare caseloads in urban and suburban areas dropped more dramatically than in rural areas. Nationally, TANF recipients declined by 62% between January 1995 and January 2002 (Table 2). During the same period, Arizona experienced a decline of TANF recipients by 55%. Although the reservations in Arizona also experienced a decline in the number of individuals receiving TANF (15% change), the rate of decline was modest. Indeed, the number of TANF recipients increased by 20% on San Carlos; on Navajo and Salt River they decreased by 16% and 15%, respectively.

METHOD

The planning phase of this research began in September 1997, shortly after the mandatory implementation of PRWORA on July 1, 1997. This phase lasted one year, during which we worked with the

Table 2: TANF Cases and Recipients on Reservations in Arizona, January 1995–January 2002

	TANF Cases			TANF Recipients		
Tribes	Jan 1995 Cases	Jan 2002 Cases	% Change 1995–2002	Jan 1995 Recipients	Jan 2002 Recipients	% Change 1995–2002
Navajo Nation[a]	4,583	3,705	−19	14,225	11,990	−16
Salt River	234	198	−15	736	622	−15
San Carlos	571	694	22	1,551	1,862	20
Reservation total, AZ	7,920	6,682	−16	23,838	20,309	−15
Total nonreservation, AZ	65,702	32,059	−51	178,043	70,597	−60
State total	73,622	38,741	−47	201,881	90,906	−55
U.S. total[b]	4,963,071	2,094,797	−58	13,930,953	5,242,707	−62

Sources: Arizona Department of Economic Security, Phoenix; U.S. Department of Health and Human Services.
[a]Data include only the Arizona portion of Navajo Nation.
[b]Information on U.S. total came from the U.S. Department of Health and Human Services/Administration for Children and Families.

tribal representatives and the staffs of Arizona Department of Economic Security (DES), Inter Tribal Council of Arizona (ITCA), and BIA–Phoenix and obtained tribal resolutions from the tribal councils of Salt River, Navajo, and San Carlos to conduct the current study. The second phase of research began in September 1998 and lasted four years.

Sampling Procedures
We began by contacting all 21 reservations in Arizona, and with the help of ITCA, we organized a meeting with tribal representatives in Phoenix at which we presented the purpose of our study. Next, we visited five tribes—Navajo Nation, San Carlos Apache Tribe, Salt River Pima-Maricopa Indian Community, Hopi Tribe, and White Mountain Apache Tribe—whose representatives had shown an initial interest in being a part of our study. Finally, of these five tribes, we received an approval from tribal councils of three reservations (Salt River, San Carlos, and Navajo) to proceed with the study. We worked with a tribal liaison person from each of these three tribes throughout the project period. In 1998, the tribes identified six qualified tribal interviewers, two from each reservation; we trained them on interview methods and ethical and human subjects issues. Also, the tribes obtained a list of TANF cases on their reservation with contact information from the DES and made the list available to us. This list was made available to the trained interviewers.

The interviewers mailed a letter introducing themselves and their role in this study, along with a project overview, a screening form, and a self-addressed stamped envelope to potential participants. To be included in the sample, residents had to have at least one dependent child younger than 18, be on AFDC/TANF (currently or in the past two years), be at least 18 years old, and be willing to be interviewed. Hence, the sampling method was nonprobability convenience.

Human Subjects
The Human Subjects Committee of Washington University reviewed and approved the study. In addition, this study was approved by tribal councils of each of the three tribes and was implemented in collaboration with the tribal liaison of each tribe. Each trained tribal interviewer provided a cover letter detailing the purpose of the study, role of the respondents, and risks and benefits of participating in the study and obtained a written consent before

conducting the interview. Every effort was made to protect the respondents and to maintain confidentiality. For instance, tracking information was stored separately from the questionnaire and no identifying information was collected on the questionnaire.

Data Collection
The first wave of person-to-person interviews was conducted between November 1998 and August 1999 with those who met the screening criteria. Interviews were conducted in mutually agreeable places (for example, respondent's home or a park) and lasted approximately 45 minutes. Respondents were compensated with $20 for their participation in the study. In total, 445 respondents from the three reservations—Salt River ($n = 72$), San Carlos ($n = 164$), and Navajo ($n = 209$)—were interviewed. Using the same approach, these respondents were interviewed annually for the next three years (wave 2 in November 1999–August 2000; wave 3 in November 2000–August 2001; and wave 4 in November 2001–August 2002).

Measures
The structured questionnaire included demographic, welfare-, and employment-related questions, among others. The dependent variable was welfare status of respondents at wave 4 or approximately four years after the first wave of interviews. The respondents who were receiving TANF at wave 4 were coded as 1, and those who were not receiving TANF were coded as 0. The predictor variables included individual characteristics, family characteristics, human capital, assets, income and benefits, welfare status, and reservation-based differences. All predictor variables were from wave 1 data. Individual characteristics included age, marital status, and physical and mental health status of respondents. Two dummy variables were created to represent marital status. Respondents who were married at wave 1 were labeled as such. Those who were never married were labeled as such, and those who were separated, divorced, and widowed were labeled as "ever married." In the logistic regression, the never-married respondents were used as a reference group. Physical and mental health status were self-reports of their overall health status on a scale ranging from 1 = very poor to 5 = excellent. Family characteristics include household size and number of children younger than age 13. Human capital variables include education and current or previous

work experience. Education involved two dummy variables—those with a high school diploma or a GED and those with more years of education—and a reference group that included those without a high school degree. Current or previous paid work experience were nominal variables. Those with any paid work experience were labeled 1 and those without were labeled 0. Assets included holding a bank account and vehicle ownership. Respondents with a bank account (savings or checking) were coded 1 and those without one were coded 0. Also, respondents who owned a vehicle were coded 1 and those who did not were coded 0. Income and benefits included monthly income (income earned or received in the previous month of interview date) from employment, TANF, food stamps, and the respondent's welfare status. Only about 10% of the sample received any earned income; this variable was, therefore, dummy coded (those with earned income = 1; those without any earned income = 0). TANF and food stamps incomes were the total amount received by the household in the previous month of the interview. A respondent's welfare status was measured by asking whether the respondent was receiving TANF at the time of the interview (yes = 1; no = 0). Finally, because reservations vary in their economic conditions and may affect welfare status, we included Navajo and San Carlos as dummy variables, and Salt River, which is less geographically isolated, as the reference group.

Attrition and Missing Values

Although we used the full sample from wave 1 in our descriptive statistics, our sample dropped in the longitudinal analyses because of sample attrition and missing values. Of 445 respondents from wave 1, 373 participated in wave 4 interviews. Of the 373 respondents, four cases did not answer whether they were receiving TANF in wave 4, which is the dependent variable in this study. Deleting these four cases resulted in 369 cases. An additional 10 cases did not answer the same question at wave 1 and were deleted. The remaining 359 cases had missing values on other predictor variables. Missing values on categorical variables—employment income, marital status, car ownership, bank account ownership, educational attainment, previous employment experience, and current work status—were deleted listwise. This process resulted in 308 cases or 69.21% of the original sample. There were some missing values in the remaining variables. Age, physical health status,

and mental health status had four or fewer values missing and number of children younger than age 13 had 28 values missing; these missing values were substituted by the mean of these variables. Household size, income from TANF, and food stamps did not have any missing values.

Given that the sample dropped from the original sample of 445 to 308, we compared the demographic characteristics of these 308 respondents with the 137 cases with missing values (or the nonrespondents) using the wave 1 data. The respondents were similar to the nonrespondents in terms of age, marital status, physical and mental health status, household size, number of children younger than age 13, previous work experience, current work status, educational status, and car ownership. Also, they were similar in their welfare use or TANF income. These two groups, however, differed significantly in terms of bank account ownership. Twenty-five percent of the nonrespondents had an account compared with 14% of the respondents ($\chi^2 = 7.8$; $p = .005$). Similarly, nonrespondents were almost twice as likely to have employment income than respondents (18% versus 10%), and the difference was statistically significant ($\chi^2 = 6.33$; $p = .01$). Respondents received a significantly higher amount in food stamps ($292/month) compared with the nonrespondents ($252/month) ($t = -2.39$; $p = .02$). Finally, the nonrespondents were more likely to be from Navajo Nation than from the other two reservations.

Data Analysis

We used univariate and bivariate statistics and logistic regression. Using bivariate statistics, we compared the characteristics of respondents by reservation and by welfare status in wave 1 in terms of their individual and family characteristics, human capital, assets, and income and benefits. For our longitudinal analyses, we used logistic regression and examined the effect of various factors from wave 1 on respondents' welfare status at wave 4. This method uses maximum-likelihood estimation to predict the likelihood of a person receiving TANF at wave 4. We used a comprehensive array of barriers including individual and family characteristics, assets, human capital characteristics, and structural factors to predict welfare use.

RESULTS

Wave 1 data show that 70% of the respondents were receiving TANF at the time of the interview

(Table 3). Only 19% of the respondents were married, with the never-married respondents being the largest group (45%). Only 11% of the respondents were employed, and more than half the respondents (52%) lacked paid job experience. More than two-thirds of the respondents did not have a GED or a high school degree. In terms of assets, only 17% had a checking or a savings account, and 74% did not own any automobile.

The respondents on the three reservations were similar except in their employment, education, and assets holdings. Respondents from Salt River were twice as likely to have employment experience as the other two tribes. Only 3% of the respondents from San Carlos had employment income compared with 10% and 20% of the respondents from Salt River and Navajo, respectively. At the time of interview, 5% of respondents on San Carlos were working for pay compared with 16% for Salt River and 15% for Navajo. In terms of education, a higher percentage of respondents on Salt River reservation lacked a GED or a high school degree compared with San Carlos or Navajo. A higher proportion of respondents from Navajo had attained postsecondary education (11%) compared with San Carlos (2%) or Salt River (6%). In terms of assets, Navajo had the highest percentage of respondents (31%) owning an automobile, whereas San Carlos had the lowest percentage of respondents (4%) with a savings or checking account.

How Are Current Recipients Different from Former Recipients?

At wave 1, respondents receiving TANF were similar to those not receiving TANF in their marital status, household size, number of children, mental

Table 3: Tribal Comparison of Respondents in Wave 1				
Variables	**Salt River (N = 72)**	**San Carlos (N = 164)**	**Navajo (N = 209)**	**Total (N = 445)**
Individual characteristics				
Mean age	35	36	37	36
Marital status				
% married	14	20	21	19
% never married	44	45	44	45
% separated, divorced, or widowed	42	35	35	36
Mean score on physical health status	3.9	4.5	4.0	4.2
Mean score on mental health status	3.7	3.8	3.5	3.7
Family characteristics				
Mean household size	5.8	4.3	5.0	4.9
Mean number of children younger than 13	2.6	2.3	2.4	2.4
Human capital				
% has ever worked for pay	89	41	48	52
% currently working at a job for pay	16	5	15	11
Educational level				
% participants without GED or high school	71	68	66	68
% participants with GED or high school	23	30	23	25
% participants beyond high school	6	2	11	7
Assets				
% owns an automobile	20	17	31	24
% has saving/checking account	30	4	23	17
Monthly income/benefits ($)				
% with any employment income (respondent)	10	3	20	12
TANF (household)	245	302	252	269
Food stamps (household)	268	313	259	280
Welfare receipt status				
% receiving TANF at wave 1	62	82	63	70

health status, and paid work experience (Table 4). In both groups, most respondents were not married (never married, separated, divorced, or widowed), with a smaller proportion of respondents married. Respondents receiving TANF were significantly younger, healthier, less educated, less likely to have assets or employment income, and more likely to be unemployed compared with respondents not receiving TANF. As expected, the former received significantly more TANF monies and food stamps compared with the latter.

How Did the Welfare Status Change Over Time?

A cross-tabulation of welfare status at wave 1 and approximately four years later at wave 4 showed that the two variables were significantly related (Table 5). Respondents receiving TANF at wave 1 were much more likely to receive it even after four years

(61.33%). Similarly, those who were not receiving TANF at wave 1 were much less likely to receive it after four years (60.19%). In other words, a slightly lower percentage of the TANF recipients at wave 1 exited TANF (38.67%) by wave 4 compared with those who entered the program (39.81%) over the four-year period.

What Are the Odds of Welfare Exit for Reservation-based Families?

The variables from wave 1 listed in Table 4, including their welfare status, served as independent variables in logistic regression predicting their welfare status after four years (see Table 6). To control for the tribal differences, we included the three tribes as dummy variables and Salt River as the reference group. Before employing the logistic regression, we conducted regression diagnostics. The interval and continuous variables were normally distributed

Table 4: Characteristics of Respondents, by Welfare Status in Wave 1 ($N = 434$)			
Variables	**Receiving TANF** $(n = 303)$	**Not Receiving TANF** $(n = 131)$	**Bivariate Comparison**
Individual characteristics			
Mean age	35.6	38.5	$t = 2.8, p = 0.00$
Marital status			
% married	17	24	$\chi^2 = 3.57, p = 0.17$
% never married	47	40	
% separated, divorced, or widowed	36	36	
Mean score on physical health status	4.3	4.0	$t = -2.25, p = 0.03$
Mean score on mental health status	3.7	3.6	$t = -0.62, p = 0.54$
Family characteristics			
Mean household size	4.8	5	$t = 1.1, p = 0.25$
Mean number of children under age 13	2.4	2.5	$t = .53, p = 0.60$
Human capital			
% has ever worked for pay	50	57	$\chi^2 = 1.80, p < .18$
% currently working at a job for pay	4.8	25	$\chi^2 = 38.90, p = .00$
Educational level			
% participants without GED/high school	67	66	$\chi^2 = 12.13, p = 0.00$
% participants with GED/high school	29	21	
% participants beyond high school	4	13	
Assets			
% owns an automobile	21	30	$\chi^2 = 3.46, p = 0.06$
% has saving/checking account	12.5	28	$\chi^2 = 14.77, p = 0.00$
Monthly income/benefits ($)			
Employment income (respondent)	6.6	26	$\chi^2 = 31.44, p < .00$
TANF (household)	314	165	$t = -9.27, p < .000$
Food stamps (household)	312	201	$t = -6.13, p = 0.00$

Note: Bivariate calculations are based on valid cases.

Table 5: Comparison of Welfare Status of Respondents at Wave 1 and Wave 4

Welfare Receipt Status in Wave 4		Welfare Receipt Status in Wave 1		
		No	Yes	Total
No	Frequency	62	99	161
	Percentage of total	17.27	27.58	44.85
	Row percentage	38.51	61.49	
	Column percentage	60.19	38.67	
Yes	Frequency	41	157	198
	Percentage of total	11.42	43.73	55.15
	Row percentage	20.71	79.29	
	Column percentage	39.81	61.33	
Total		103	256	359
		28.69	71.31	100

Note: $\chi^2(1, N = 359) = 13.75, p \leq .000$.

and the multicollinearity among the independent variables was well within the acceptable range; the tolerance values ranged from .34 to .89 (Fox, 1991).

The logistic regression model was significant ($\chi^2 = 33.12, p = .02$). A closer look at the model shows that having employment income at wave 1 significantly reduced the likelihood of receiving TANF in wave 4 (odds ratio = .30). In other words, the odds of receiving welfare at wave 4 for someone with employment income in wave 1 were about 70% lower than the odds for someone without employment income. All the other individual-level variables, including education and marital status, were not statistically significant predictors of welfare exit over time. Age and health status were significantly associated with welfare status in the bivariate analyses of wave 1 data, but not so in the longitudinal multivariate analysis. Similarly, education, household-level welfare income (including TANF and food stamps), and asset variables (vehicle ownership and having a savings or a checking account) were significantly associated with welfare status in cross-sectional bivariate analyses of wave 1 data; in the longitudinal multivariate analysis, however, the effect of these variables on welfare exit was erased. Also, respondents' welfare status at wave 1 was not significantly related to their welfare status at wave 4 in the multivariate analysis.

One of the most striking findings was that the reservation-based differences had significant effects even after controlling for various individual, family, human capital, assets, and income characteristics. The predicted odds of a Navajo respondent receiving welfare after four years were 3.43 times the odds for a Salt River respondent. The odds ratio was higher

for San Carlos; the predicted odds of a respondent from this reservation receiving welfare after four years were 3.58 times the odds for a respondent from Salt River. In other words, the odds of a respondent from San Carlos reservation receiving TANF was 258% higher than the odds a respondent from Salt River. Similarly, the odds of a respondent from Navajo Nation receiving TANF were 243% higher than a respondent from Salt River.

DISCUSSION

Analysis of Main Findings

We examined the effects of micro and structural factors on welfare exit among reservation-based families. Welfare recipients on reservations faced different barriers to welfare exit than did recipients off reservations. Studies have noted that individual, family, human capital, and employment-related factors are linked to welfare exit. These variables, however, failed to predict welfare exit on American Indian reservations. Indeed, on reservations, age, marital status, physical and mental health, human capital, and assets of respondents who were on welfare and those who exited welfare were similar. Having previous job experience and assets in the form of a savings or a checking account were influential in bivariate analyses but were not significant in logistic regression.

Neither marital status nor education was a significant predictor of welfare status. Married women were equally likely to receive TANF, as were never- or ever-married women. This is an important finding in light of the current policy focus on two-parent family formation. Also, our multivariate analysis did not find any relationship between education and

welfare exit. It is not clear whether a bachelor's degree would have made any difference; we could not examine the effect of a bachelor's degree on welfare exit because only 17 of 308 respondents (or 5.5%) had education beyond high school. Nevertheless, it is important to remember that welfare recipients on reservations have very low educational attainment compared with their counterparts nationally. For instance, nearly 71% of respondents on Salt River did not have a high school degree. These women are not equipped to exit welfare without additional job preparation. Governments will have to make long-term educational opportunities available to these women to help them compete in the labor market (Pandey, Brown, et al., 2004). Other national studies also indicate that investment in college education will speed up the transition from welfare to more stable employment (Pandey, Brown, et al.; Zhan & Pandey, 2004a, 2004b).

Next, to determine the effect of structural variation on welfare exit, we included reservations as dummy variables in our multivariate model (Table 6). When individual differences were controlled, community-level differences became more pronounced. Respondents on Salt River reservation were significantly more likely to exit welfare compared with the respondents from the other reservations. This finding suggests different policy emphasis for different reservations. For instance, in general Salt River has lower unemployment and poverty rates and a higher educational attainment rate (Table 1). At the same time, Salt River's welfare cases had a much lower educational accomplishment (see Table 3), an indication that on Salt River, only those with very low education applied for welfare benefits. On the other hand, Navajo and San Carlos had a higher proportion of respondents with a high school degree who relied on welfare. Boosting educational attainment of current and former welfare recipients may be a strong welfare-to-work strategy on the Salt River reservation. At the same time, scarcity of job opportunity is a major impediment to exiting welfare on the Navajo and San Carlos reservations. Creating jobs is one of the most important steps in realizing the policy goals of the federal welfare reform legislation of 1996 on these reservations.

Finally, this study shows that welfare caseloads on reservations have not dropped as dramatically as they have nationally or regionally (see Table 2). Indeed, caseloads have risen on six reservations, which also have very high jobless rates (Pandey,

Zhan, et al., 2004). This finding is consistent with the GAO (2002) study that surveyed all 370 tribal chairpersons around the country. According to the report, on 57 reservations more than 50% of families had incomes below the federal poverty level. Three-fourths of reservations experienced the same or increased poverty since 1996, with TANF caseloads remaining constant or rising on 49 reservations. The current decision to maintain TANF funding at the 1996 level and to increase funding for support programs (such as child care and transportation) for low-income families is based on the premise that caseloads have declined considerably and that jobs are available for those who want to work. Many reservations are geographically isolated and do not share the national trends of job growth, decline in unemployment rates, or drop in welfare caseloads (Pandey, Brown, et al., 2004). The GAO report also noted that many reservations lack some of the key factors (for example, skilled workforce, easy access to markets) associated with economic growth. Also, although some tribes encourage private investors who are not tribal members to invest on their reservations, 86 tribes preferred to promote tribally owned enterprises to stimulate the economy on their reservations (GAO). There is also evidence that not all tribally owned enterprises (including the gaming industries) are generating a substantial income. For example, the tribally owned casino on San Carlos barely generates enough funds to cover its costs (GAO).

Study Strengths and Limitations

To the best of our knowledge, this is the only longitudinal study that monitored the effects of welfare reform on reservation-based families right after the passage of the welfare reform act of 1996. The follow-up response rate was high; nearly 84% of the respondents from wave 1 were interviewed after four years. We used multiple sources of data (including national, state, tribal, and individual) in our study. Still, there are a number of limitations to this study. The sample frame included only families who were residing within the three reservations. Anyone residing outside the reservation boundary was excluded. The sampling procedure may have resulted in an oversample of people who were known or were easily accessible to the interviewers. There was no meaningful way to compare the characteristics of those included in this study with those excluded.

Table 6: Results from Logistic Regression Predicting Respondents' Probability of Welfare Receipt at Wave 4

Variables	Coefficients	Wald Chi-square	Odds Ratio
Individual characteristics			
Age	−0.03	3.07	0.97
Marital status			
Married	0.14	0.13	1.15
Divorced, widowed, or separated	0.26	0.73	1.30
Never married (reference group)			
Physical health status	−0.05	0.17	0.95
Mental health status	0.03	0.05	1.04
Family characteristics			
Household size	0.10	1.53	1.11
Number of children under age 13	0.22	3.50	0.80
Human capital			
Work experience			
Has ever worked for pay (1 = yes; 0 = no)	0.22	0.55	1.24
Currently working at a job for pay (1 = yes; 0 = no)	−0.01	0.00	0.99
Educational level			
Without a high school diploma (reference group)			
High school diploma	−0.18	0.37	0.84
Beyond high school degree	0.37	0.39	1.45
Assets			
Owns an automobile (yes = 1; no = 0)	−0.34	1.01	0.71
Has saving/checking account (yes = 1; no = 0)	0.13	0.12	1.14
Mean monthly income/benefit ($)			
Employment income (respondent) (yes = 1; no = 0)	−1.20*	5.08	0.30
TANF (household)	0.00	2.00	1.00
Food stamps (household)	−0.00	0.22	1.00
Respondent's welfare status at wave 1	0.25	0.59	1.28
Tribal comparison			
Salt River (reference group)			
San Carlos	1.28**	9.20	3.58
Navajo	1.23**	9.07	3.43
Intercept	−0.03	0.00	
Model Chi-square (likelihood ratio)	33.12*		
Degrees of freedom	19		
N	308		

*$p < .05$. **$p < .001$. Missing values = 137.

Also, we were not able to access a demographic breakdown of welfare recipients by each tribe. We know, however, that the 445 respondents interviewed in wave 1 included approximately 47% of the TANF cases on Salt River, 29% on San Carlos, and 6% on Navajo Nation. The sample respondents may have been slightly better educated than the overall adult welfare populations on these reservations (GAO, 2002). On Navajo Nation, however, the TANF recipients served by the Native Employment Works (NEW) program in 1998 had levels of education similar to those of our sample respondents. Of the 833 NEW program participants, about 54% did not have a GED or a high school education; in our sample, 66% did not. About 37% had graduated from high school or received a GED; in our sample, 23% had. And about 9% had attained some college education; in our sample, 11% had

(Navajo Department of Workforce Development, 1999). Therefore, although our findings might not be substantively different from the overall TANF populations on these reservations, the generalizability is limited to the respondents interviewed in this study because of the nature of sampling procedure used. In addition, the effect of support for child care on welfare independence could not be estimated because very few families used a formal child care facility (Pandey et al., 2002). Finally, sample attrition in the longitudinal study posed an additional limitation and further limits generalizability of this study.

IMPLICATIONS FOR POLICY

How might we refine our future social policies so that the nation's most vulnerable populations are not further marginalized? Although this study has many limitations, there is evidence that the welfare caseloads on reservations in Arizona have not followed the national trend in terms of caseload decline, and that structural factors (such as regional unemployment rate) are more important in welfare case reduction than individual- or family-level interventions, such as two-parent family formation. In the long run, governments (federal, state, and tribal) should focus on economic development and job creation, particularly on or near reservations with a large concentration of welfare caseload. For example, governments may strengthen policies that provide incentives to tribal investors who invest on or near reservations. Also, tribes may explore the possibility of promoting investment from private investors. In the short run, governments will have to allocate resources disproportionately in favor of tribes experiencing a slower decline (or even growth) in caseloads on their reservations. SWR

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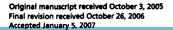
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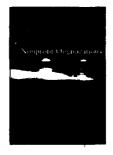
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