EVALUTION OF RETENTION, TENURE AND WAGES OF DIRECT SUPPORT WORKERS IN DEVELOPMENTAL DISABILITY PROGRAMS

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Preface

EXECUTIVE SUMMARY

This report presents an evaluation of the retention and tenure of residential and day care (non-residential) direct support workers (DSW) who deliver development disability services that are provided in residential settings in the State of Delaware. The evaluation has been funded in 2002-2003 through a grant from the Developmental Disabilities Council of the State of Delaware. The evaluation encompasses a twofold focus. First, the dimensions of retention (job separation), tenure (length of service), and wages of DSW are investigated. Second, econometric (statistical) analyses are conducted to assess the determinants of DSW retention, tenure and wage.

Following are highlights of the evaluation:

- The level of education of newly-hired Residential and Day Care DSW has been considerable between 1998 and 2002, with at least 60% of the workers having some college education or a college degree.

- Proportionately more Residential DSW have some college education than Day Care DSW.

- The proportion of DSW by education level of both types of DSW has remained stable over the past five years.

- DSW differ geographically between New Castle County –NCC-- and Non-New Castle --NNCC --, (inclusive of Sussex and Kent), counties by gender, race, and education.

- An equal proportion of DSW had prior employment in industries that are related as well as unrelated to direct support care.

- Consistently over the past five years, 60% of all newly-hired DSW had prior experience as DSW.

- The data reveal that most DSW do not have a long-term commitment to their positions, as indicated by low employment tenure.

  A. 44% of DSW stay at their jobs for less than a year.

  B. 67% of DSW have tenure of one year or less.

  C. 78% of DSW remain at their jobs for two years or less.

  D. Only 13% of all DSW stay with their jobs for five or more years.

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- The pattern of tenure is very similar, if not nearly identical, for both residential and for day care DSW.

- A very large (and identical) majority of Residential and Day Care have a maximum length of service (TENURE) of one year of DSW, 67%.

- Tenure of DSW does not differ among DSW in the two regions of the State of Delaware. The length of service of DSW in New Castle County (NCC) parallels that of Non-NCC.

- Between 1991 and 1999 separations have increased from 57% to 79% indicating over this period a greater proportion of DSW are leaving their jobs within three to four years.

- On a statewide basis between 1998 and 2001, DSW separations have ranged from 48% to 63% within two years of their hiring.

- The data confirm that not only are resignations a large problem but also terminations are a considerable difficulty for maintaining a stable DSW workforce.

- Wages play a central role in the separation decisions of DSW. At lower current wage levels (CWAGE), DSW are more likely to leave their support job than when their current wage is higher.

- Providers appear to be compensating employees for their length of services as a DSW. For every year of tenure, DSW receive a 5.5% return in form of wage increases. Nevertheless, while this annual average increment is seemingly sizeable, it appears to be insufficient to retain DSW as evidence by the low retention rate and short tenure of DSW.

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I. SCOPE OF REPORT

A. Objectives

This report presents an evaluation of the retention and tenure of residential and day care (non-residential) direct support workers (DSW) who deliver development disability services that are provided in residential settings in the State of Delaware. The evaluation has been funded in 2002-2003 through a grant from the Developmental Disabilities Council of the State of Delaware. The evaluation encompasses a twofold focus. First, the dimensions of retention (job separation), tenure (length of service), and wages of DSW are investigated. Second, econometric (statistical) analyses are conducted to assess the determinants of DSW retention, tenure and wage.

Both the tabular and econometric (statistical) results have been undertaken with data collected from six service providers: Martin Luther Homes of Delaware, Inc.; Ken Crest Services; Benedictine of Delaware; The Chimes; Opportunity Center; and Easter Seals of Delaware. Within the state of Delaware, several of these organizations are the largest providers of publicly-financed services for development disability clients, and they account for nearly 90% of all clients served. The data covers a period of 1998 to 2002, and it has been collected for every worker employed at each separate residential site and day care site of the participating providers. The variables of the collected data are shown in the Appendix. Where feasible, the analysis will assess geographical (e.g. county) differences. Because of the large volume of data and analyses, many of the supporting tables and equations will be placed in an appendix.

The report contains the following sections. Section 2 presents a brief demographic and employment profile of DSW in Delaware. Sections 3 and 4 encompass the major objectives of the study stated above.

B. Bases of Analyses

Many Delaware providers of residential care for development disabled individuals have reported that their employment of DSW in Delaware has manifested low retention. The present evaluation confirms this detrimental outcome. Such low retention raises concerns because of two potential negative impacts. One, low retention of DSW could result in increased recruitment costs (for the replacement of separated DSW), increased training costs of newly hired DSW, and increased costs for overtime costs until vacant positions are filled. Two, there is likely to be detrimental consequences related to the service delivery to disabled clients. Retention leads to a "temporary" situation of operating below a necessary staff-to-client ratio so that negative actions occur. Clients could be harmed because of inadequate level of staffing to oversee the clients' needs and activities; and due to insufficient staffing on site, stress among DSW and/or their overextension could occur so that the DSW become a source of harm to clients. These harms are reflected by incidence reports that must be filed with the State when harm to clients occur, irrespective of their source, or where infractions are made by DSW that could lead to client harm. An intended objective of the present evaluation was to assess the impacts of retention and tenure on worker replacement costs and negative incidences but data on these items could not be obtained.

The increased financial costs for recruitment, hiring, training and overtime could be reduced or, some could be avoided, if retention and tenure could be enhanced. Likewise, incidences could be mitigated if retention and tenure were decreased. To take action to reduce retention and increase tenure, however, requires that their sources be ascertained so that the determinants can be manipulated through policy changes. The determinants or sources of retention can be investigated by econometric models in which "causes" of (or reasons for) DSW job separation and tenure can be evaluated. Two major hypotheses of why the retention rates and the extent of tenure by DSW occur are that wage levels and the availability of benefits may strongly influence DSW commitment to their jobs. These hypotheses as well as some other significant ones have been explored in the present analysis. The empirical evaluation confirms several import hypotheses, especially wages as determinants of retention and tenure.

II. PROFILE OF DIRECT SUPPORT WORKERS (DSW)

DSW are profiled according to their demographic characteristics and their employment experience. The review covers the 1998 – 2002 period with some descriptions presented on annual basis.

A. Demographic Characteristics of DSW

The demographic characteristics of both residential and day care (non-residential) DSW are shown in percentage terms on Table 1. The figures refer to the number of DSW hired each year from 1999 to 2002. The actual numbers of each type of worker for the demographic variables are presented in the appendix.

Table 1

Demographic Profile of Residential and Day Care (Non- Residential) DSW by Year of Hire*													
	Residential							Day Care					
	1998	1999	2000	2001	2002	Total		1998	1999	2000	2001	2002	Total
	%	%	%	%	%	%		%	%	%	%	%	%
Gender													
Female	62	74	73	77	84	74		28	31	48	35	14	32
Male	38	26	27	23	16	26		72	69	52	65	86	69
Race													
Caucasian	11	18	17	24	17	18		58	70	49	50	59	58
African American	87	81	82	72	80	79		42	30	51	50	41	42
Other	3	1	1	4	3	3		0	0	0	0	0	0
Education													
Less than H.S.	0	0	1	0	0	1		0	1	1	0	1	1
H.S.	15	12	13	23	2	88		20	31	30	29	34	29
Some College	6	12	9	9	7	55		61	53	54	51	49	53
BA and above	4	6	16	13	4	55		19	15	15	20	16	18
Age													
17-20 years	0	0	0	0	0	0		4	5	6	3	3	5
21-25 years	1	6	10	11	6	37		30	32	22	21	21	24
26-35 years	11	12	25	17	15	97		44	35	30	44	44	37
36-45 years	11	7	16	13	6	78		17	17	22	19	19	20
46-55 years	2	5	13	12	8	56		5	10	12	14	9	10
56-65 years	3	2	1	4	0	15		0	3	1	7	3	3
over 65 years	0	0	0	0	0	2		0	0	0	0	0	0
Marital Status													
Single	18	19	27	18	7	120		69	69	67	70	65	66
Married	10	13	26	20	12	109		31	31	33	30	35	34

*The totals include DSW hired before 1998.
2002 does not include a full year of data

1. Residential and day care DSW differ distinctly and statistically by their demographic characteristics of gender, race, and education (as given by a regression equation shown in appendix),

2. Gender:

    a. Residential DSW have been predominantly female, accounting for 75% of newly hired DSW since 1998.

    b. In contrast, Day Care DSW have been comprised largely of males during the past five years.

3. Race:

    a. A preponderant proportion of newly hired Residential DSW,--approximately 80% between 1998 and 2002,--have been African Americans.

    b. The proportion of Day Care DSW has been equally split between African Americans and Caucasians.

4. Education:

    a. The level of education of newly-hired Residential and Day Care DSW has been considerable between 1998 and 2002, with at least 60% of the workers having some college or a college degree.

    b. Proportionately more Residential DSW have some college education than Day Care DSW.

    c. The proportion of DSW by education level of both types of DSW has remained stable over the past five years.

5. Age:

    a. The age structures of both Residential and Day Care DSW have been relatively similar since 1998.

    b. On annual basis over the past five years, newly-hired Residential and Day Care DSW have been drawn consistently and preponderantly –over 70%-- from the 21 to 45 years of age group.

    c. Hiring by age peaks at the 26 to 35 years of age group.

6. Marital Status:

    a. There has been a steady reliance on recruiting Residential DSW who are single; they have accounted for more than 65% of all newly hired DSW for

the past five years. One implication is that the required work hours of DSW are not attractive to married individuals.

b. For Day Care services, there has been steady decline in recruitment of single individuals, such that the majority of newly-hired single workers in 1998 has been replaced by a majority of newly- hired workers who are married.

Table 2 presents DSW according to the region of their provider employment. All Residential and Day Care DSW hired from 1998 through 2002 are included.

Table 2

Demographic Profile of All DSW by Region				
	NCC	Non-NCC	#	%
Gender				
Female	598 (62%)	289 (70%)	907	65%
Male	363 (38%)	121 (30%)	487	35%
Race				
Caucasian	213 (24%)	134 (34%)	349	27%
African American	672 (74%)	249 (64%)	939	71%
Other	19 (2%)	9 (2%)	28	6%
Education				
Less than H.S.	6 (1%)	1 (0%)	8	1%
H.S.	242 (28%)	148 (40%)	398	32%
Some College	439 (50%)	162 (44%)	614	49%
BA and above	186 (21%)	55 (15%)	241	19%
Age				
17-20 years	32 (3%)	22 (6%)	55	4%
21-25 years	223 (24%)	68 (18%)	296	22%
26-35 years	355 (38%)	127 (33%)	487	36%
36-45 years	195 (21%)	90 (23%)	294	22%
46-55 years	102 (11%)	63 (16%)	167	12%
56-65 years	26 (3%)	17 (4%)	43	3%
over 65 years	6 (1%)	1 (0%)	8	1%
Marital Status				
Single	554 (64%)	218 (59%)	791	63%
Married	305 (36%)	154 (41%)	461	37%

1. Some of the demographic characteristics of all DSW are slightly different according to the regions of the State of Delaware. Specifically, DSW differ

geographically between New Castle County –NCC-- and Non-New Castle --NNCC --, (inclusive of Sussex and Kent), counties by gender, race, and education. (See the appropriate equation in the appendix).

2. While females DSW account for the substantial majority of all DSW in the State (62% in NCC and 70% in NNCC), there is a greater reliance on the hiring of females in NNCC than NCC.

3. Minorities account for the majority of DSW in both NCC and NNCC. However, providers in NCC have greater reliance on minority individuals (at 76%) as DSW than providers in NNCC (at 66%).

4. In all areas of the State, individuals with some college education and with BA degrees account for slightly more than two-thirds of DSW employment, as compared to one-third of all DSW who have a high school education or less. However, slightly more workers in NCC than NNCC have more formal education.

B. Employment Experience of DSW

The industry of last employment of <u>only</u> Residential DSW prior to their entering direct support care is shown in Tables 3. Again, the figures refer to the number of newly-hired DSW each year from 1999 to 2002. Data on previous employment by the regional location of DSW, and a statistical model, are provided in the appendix.

Table 3

Industry of Last Employment of DSW by Year												
	1998		1999		2000		2001		2002		Total*	
	#	%	#	%	#	%	#	%	#	%	#	%
Industry												
Banking	2	2	8	6	12	5	11	5	6	5	49	4%
Building Services	9	8	2	1	2	1	5	2	2	2	22	2%
Child Care	0	0	3	2	5	2	4	2	2	2	17	2%
Construction	0	0	1	1	0	0	2	1	1	1	8	1%
Eating/Drinking Establishments	4	3	7	5	10	4	9	4	5	4	42	4%
Education	3	3	6	4	7	3	6	3	3	3	39	3%
Government	7	6	11	8	10	4	15	7	5	4	63	6%
Health Industry (excl. hospitals)	11	9	13	9	27	11	27	12	15	13	128	11%
Hospitals	5	4	3	2	5	2	7	3	2	2	25	2%
Insurance	1	1	0	0	3	1	1	4	2	2	7	1%
Manufacturing	3	3	7	5	10	4	14	6	8	7	51	5%
Miscellaneous	0	0	0	0	0	0	1	4	1	1	2	0%
Religious	2	2	1	1	0	0	3	1	1	1	13	1%
Residential Care	44	38	39	27	100	39	50	22	30	26	363	33%
Retail	8	7	8	6	23	9	13	6	10	8	77	7%
Service-Miscellaneous	7	6	16	11	18	7	34	15	11	9	105	9%
Social Services	2	2	6	4	9	4	6	3	5	4	33	3%
Temporary Agency	8	7	10	7	14	5	13	6	6	5	63	6%
Transportation	0	0	2	1	1	4	2	1	1	1	7	1%

Percentages will add up to greater than one due to rounding.
Finance = banking and insurance.
Health = health industry, and hospitals.
Residential Care = Residential Care.
Retail = retail, eating/drinking.
Service = Service miscellaneous, Temp Agency, Building Services.
Miscellaneous = miscellaneous, construction, manufacturing, transportation.
Social Services = child care, education, religion, social services
Total = total includes all DSW employed during 1998-2002, including those hired prior to 1998.

1. An equal proportion of DSW had prior employment in industries that are related as well as unrelated to direct support care.
   a. Approximately 50% of all DSW had experience in childcare, health industry including and excluding hospitals, residential care, and social services.
   b. Likewise, approximately 50% of all DSW had experience in non-health related fields.
   c. These proportions of prior employment have remained stable over the past five years.

2. No non-health occupations predominate as sources of prior employment. The recruitment from non-health occupations has remained diverse since 1998.

3. A substantial proportion of newly-hired DSW have had prior experience in residential care services before their present DSW position—on average 33 %,--but the draw from this occupation has declined between 1998 and 2002 from 38% to 26%.

4. Compared to DSW in Non-New Castle counties (NNCC), DSW working in New Castle County (NCC) are more likely to have had experience in finance, health, residential services, and social services. Providers in both areas are equally likely to recruit individuals with prior experience in retail and government.

Table 4 shows some elements of the work experience of only Residential DSW. The data is presented according to the year that individuals were hired as DSW from 1998 to 2002 (See the row "Total # Hired). "DSW Experience" indicates the number of newly hired DSW in a given year who had experience as DSW before being hired in their present DSW position. The average number of years of prior DSW experience is also given. "Non-DSW Experience" shows work experience of newly-hired DSW in a given year who held non-DSW jobs prior to their hiring as a DSW.

Table 4

Work Experience of Residential DSW Prior to Hiring as DSW by Year												
	1998		1999		2000		2001		2002		Total*	
	#	%	#	%	#	%	#	%	#	%	#	%
Total # Hired	114	100	140	100	248	100	222	100	118	100	1098	100
DSW Experience	68	60	83	59	162	65	123	55	72	61	683	62
Avg. no. of Years	2.4	-	2.1	-	2.7	-	2.6	-	2.2	-	2.6	-
Non-DSW Experience	46	40	57	41	86	35	99	45	46	39	415	38
Avg. no of Years	2.7	-	3.3	-	3.5	-	5.2	-	4.2	-	3.8	-

Total=total includes all DSW employed during 1998-2002, including those hired prior to 1998.

1. Consistently over the past five years, 60% of all newly-hired DSW had prior experience as DSW.

2. The average number of years of prior DSW job experience for these newly-hired DSW was fairly consistent at 2.6.

3. One obvious implication is that former DSW are a considerable source of employment for DSW job, and that many former DSW return to jobs as caregivers.

4. Conversely, consistently between 1999 and 2002, 40% of all newly-hired DSW did not have any DSW job experience previous to their employment in a DSW job.

5. However, over the five year period, the average number of years of newly-hired DSW with non-DSW job experience has varied considerably from 2.7 years to a high of 5.2 years.

6. An interpretation of this variation is that recruitment of individuals who have job experience in other fields of work may well depend upon the prevailing economic conditions.

III. TENURE, RETENTION, AND WAGES OF DSW

The three interrelated dimensions of DSW jobs,--tenure, retention, and wages--, are investigated in this section. For each dimension, various profiles are provided, and then econometric models of the determinants of (reasons for) retention, tenure and wages are tested and the results are interpreted. The econometric models for each dimension are specified (designated) with various classes of independent variables: (a) social, economic, and demographic characteristics of DSW, (b) organizational (internal) characteristics of the providers for whom the DSW work, and (c) exogenous (external) forces that could influence the selected DSW dimensions.

A. Profile of DSW Job Behavior

Both retention and tenure are directly related. <u>Tenure</u> is the extent of the job longevity that individuals have as DSW. That is, tenure measures the amount of time (in months or years) that individuals have remained active as a DSW with a particular employer. <u>Retention</u> represents the decisions that have been made by either the provider or DSW about the separation from, or continuation of, employment as a DSW after a

period of (long or short) tenure. Put differently, retention measures whether an individual decides to continue (or remain) a DSW, leaves voluntarily (or quits/resigns), or is terminated (or fired) by the provider. Tables 5 through 9 provide an overview of various perspectives of the retention and tenure of DSW in Delaware between 1998 and 2002.

The tenure of both Residential and Day Care DSW in Delaware is presented on Table 5 for the combined years of 1998 through 2002. The longevity of DSW as employees of one provider is given according to the number of years that the DSW have remained at their position after their hiring. The data reveal that most DSW do not have a long-term commitment to their positions, as indicated by low employment tenure. That is, DSW remain in their care jobs for only a limited number of years.

Table 5

Tenure - Years Worked By Residential and Day Care DSW For A Provider			
Years	#	%	Cumulative %
Less than one year	610	44%	44%
One year	323	23%	67%
Two years	158	11%	78%
Three years	74	5%	83%
Four years	52	4%	87%
Five years	39	3%	90%
Six or more years	140	10%	100%
Total	1,396	100%	

1. 44% of DSW stay at their jobs for less than a year.
2. 67% of DSW have tenure of one year or less.
3. 78% of DSW remain at their jobs for two years or less.
4. Only 13% of all DSW stay with their jobs for five or more years.

Table 6 provides a breakdown of the tenure of DSW into two separate categories. In Part A, the tenure of residential and day care are shown separately. In Part B, the tenure behavior of all DSW combined are given for the regions of NCC and NNNC.

Table 6

Tenure--Differences By Type of DSW and Region						
Part A: Residential and Day Care Comparison						
	Residential			Non-residential		
	#	%	Cumulative %	#	%	Cumulative %
DSW Length of Service						
Less than one year	475	43%	43%	135	46%	46%
One year	262	24%	67%	61	21%	67%
Two years	127	12%	79%	31	11%	78%
Three years	58	5%	84%	16	5%	83%
Four years	44	4%	88%	8	3%	86%
Five years	35	3%	91%	4	1%	87%
Six or more years	101	9%	100%	39	13%	100%
Part B: Regional Comparison of Residential and Day Care DSW						
	NCC			*Non-NCC*		
	#	%	Cumulative %	#	%	Cumulative %
DSW Length of Service						
Less than one year	418	44%	44%	184	45%	45%
One year	225	22%	66%	90	24%	67%
Two years	116	12%	78%	38	9%	76%
Three years	48	5%	83%	24	6%	82%
Four years	41	4%	87%	11	3%	85%
Five years	25	3%	90%	11	3%	87%
Six or more years	88	9%	100%	52	13%	100%

1. The pattern of tenure is very similar, if not nearly identical, for both residential and for day care DSW.

2. A very large (and identical) majority of both types of DSW, 67%, leave in the first year of service.

3. Only a minority of residential and day care workers (9% and 13 % respectively) remains as DSW for more than five years.

4. Tenure of DSW does not differ among DSW in the two regions of the State of Delaware. The length of service of DSW in NCC parallels that of NNCC.

5. Respectively 66% and 67% of DSW in NCC and NNCC leave their DSW jobs after on year of service.

This short-term adherence—or conversely, lack of long-term commitment-- of DSW to their jobs can be seen by the comparison of the hiring and separation of DSW in

the past five years. This comparison yields the retention of DSW. Table 7 shows the profile of Residential and Non-Residential DSW tenure according to the year of hiring by a provider. The data covers DSW hired by providers from 1984. The table displays the number and proportion of hired employees who have remained employed as DSW ("Still Employed") <u>as of 2002</u> according to their year of hire. It also shows the number of DSW who were separated from their position according to the year in which the separations occurred ("Resignations" and "Terminations"), given the year of their hiring.

Table 7

Residential and Day Care DSW - Employment Status by Year of Hire									
Year Hired	# of Hires	Still Employed As of 2002		Number of Separations: Resignations and Terminations					
		#	%	1997	1998	1999	2000	2001	2002
1984	5	4	80%	0	0	0	0	0	1
1986	1	1	100%	0	0	0	0	0	0
1987	5	5	100%	0	0	0	0	0	0
1988	5	3	67%	0	1	1	0	0	0
1989	17	7	54%	0	1	5	3	1	0
1990	13	7	56%	0	2	1	1	2	0
1991	11	4	43%	0	2	1	3	1	0
1992	15	6	44%	0	4	3	2	0	0
1993	13	4	25%	0	2	1	5	0	1
1994	42	18	44%	2	4	5	9	3	1
1995	33	11	31%	0	7	5	5	3	2
1996	44	17	46%	1	10	5	7	3	0
1997	128	24	19%	3	47	19	25	10	1
1998	144	28	19%	0	26	48	27	15	0
1999	171	35	21%	0	0	47	61	21	7
2000	312	89	31%	0	0	0	97	90	35
2001	278	143	52%	0	0	0	0	83	50
2002	158	118	75%	0	0	0	0	0	40
Total	1,394	524	38%	6	106	141	245	232	138
Missing: 2 Data collected for 2002 was not for the complete year.									

1. It must be recognized that the DSW <u>retention ("Still Employed")</u> covers the year of initial hire to the year of 2002. As a result, the retention for DSW hired in later years may be understated since the passage of time is shorter for these hired DSW than those hired in the earlier years. Retention for those hired within the years of 1984-1997 are overstated as data was not collected on DSW that left prior to 1998.

2. Concomitantly, the bulk of DSW separations (resignations and terminations) occur within three to four years of hiring.

3. Only 38% of all DSW hired between 1984 and 2002 were still employed in 2002 as a DSW.

4. Conversely, over the same period, 62% of all hired DSW have left their job as a DSW.

5. Retention of DSW appears to have been strong from 1984 to 1990, with a retention rate above 50%.

6. Between 1991 and 1999, separations have increased from 57% to 79% indicating over this period a greater proportion of DSW are leaving their jobs within three to four years.

7. Put differently, between 1991 and 1999 separations have increased from 57% to 79%, indicating over this period a greater proportion of DSW are leaving their jobs within three to four years.

8. For 2000, 2001 and 2002, DSW retention is higher and the separation of DSW is lower than previous years, but these numbers understate retention since they cover a shorter time frame over which larger separations are likely to occur as shown by past behavior.

9. The pattern of DSW separations has been very similar in both New Castle County (NCC) and the two southern counties (NNCC), and parallels the statewide perspective. (See the Appendix for the tables on NCC and NNCC).

10. The Statewide pattern of DSW separations obscures the difference between Residential and Day Care DSW. Day Care DSW manifest greater separations within five years than Residential DSW. That is, for each year after their hiring, a larger proportion of Day Care DSW leave their job than do Residential DSW. (See the relevant tables in the Appendix).

The scope of the DSW retention problem can be put in stark perspective by determining the number and proportion of DSW hires that were separated (both terminations and resignations) from their provider within the first year of their hiring and

within the first two years of their hiring. This comparison is given for the years 1998 through 2002 in Table 8.

Table 8

Comparison of Separations With Hires								
Separations Within One Year								
	Statewide			Residential			Day Care		
Year	No. of Hires	Separations		No. of Hires	Separations		No. of Hires	Separations	
		No.	%		No.	%		No.	%
1998	144	26	18	115	22	19	29	4	14
1999	171	47	27	136	43	32	35	4	11
2000	312	97	31	247	68	28	65	29	45
2001	278	83	30	220	63	29	58	20	34
2002	158	40	25	123	30	24	35	10	29
Separations Within Two Years								
	Statewide			Residential			Day Care		
Year	No. of Hires	Separations		No. of Hires	Separations		No. of Hires	Separations	
		No.	%		No.	%		No.	%
1998	144	74	51	115	59	51	29	15	52
1999	171	108	63	136	84	62	35	24	69
2000	312	187	60	247	140	57	65	47	72
2001	278	133	48	220	98	45	58	35	60
2002	158	na	na	123	na	na	35	na	na

na: not applicable.

1. On a Statewide basis, between 1999 and 2002, the proportion of newly hired DSW who were separated from their job in the first year of service ranged from 18% to 31%.

2. The separations of Residential DSW within the first year of their hiring were relatively greater than that of Day Care DSW for 1998 and 1999. However, the separations of Day Care DSW within their first year of their hiring were relatively higher than that for Residential DSW.

3. The number of separations for the newly-hired DSW has risen very significantly in the second year of their hiring.

4. On a statewide basis between 1998 and 2001, DSW separations have ranged from 48% to 63% within two years of their hiring.

5. Specifically, for the years 1998, 1999, 2000, within two years of their hiring, more than half the newly hired DSW have left their care giving job, and this large departure was slightly lower (45%) in 2001.

6. Residential and Day Care DSW have differed only by a small margin between 1998 and 2002 with Day Care workers manifesting a slightly higher separation rate than Residential workers.

The reasons for the separations of Residential DSW from 1998 to 2002 inclusive are shown on Table 9. The reasons are classified according to interpretation of data provided in the personnel records of the participating providers.

Table 9

Reasons for Separations of Residential DSW Positions		
Reason	#	%
A. Still working	530	38%
B. Terminations	321	23%
C. Resignations	422	37%
• Another job	130	9%
• Education	31	1%
• Health	34	2%
• Home responsibilities	16	1%
• Job conditions	40	3%
• Money	5	0%
• None given	200	14%
• Personal	55	4%
• Relocation	32	2%
D. Total	1,128	100%

1. At the time of analysis (2003), 38% of Residential DSW included in the data records for the years 1998 to 2002 were still employed as DSW.
2. Providers terminated 23% of the total number of DSW within the five year time frame.
3. Resignations (quits) of DSW account for 37% of all separations between 1998 and 2002. Unfortunately the largest category of voluntary leaves was for "none given".

4. The data confirm that not only are resignations a large problem but also terminations are a considerable difficulty for maintaining a stable DSW workforce.

Tables 10 and 11 provide a perspective on the wages of DSW. The figures on the tables are nominal wages, i.e., not adjusted for inflation.

Table 10

	DSW Initial Hourly Wage	DSW Avg. Hourly Wage-All	Hourly Wage at Prior Occupation	National Minimum Wage	DE Minimum Wage
Average Wages of DSW by Year of Hire					
Year					
1995	7.38	n/a	7.24	4.25	4.25
1996	7.60	n/a	7.51	4.75	4.75
1997	8.00	n/a	7.90	5.15	5.15
1998	7.91	7.99	7.89	5.15	5.15
1999	8.38	8.50	8.47	5.15	5.65
2000	9.11	9.21	9.23	5.15	6.15
2001	9.56	9.64	10.09	5.15	6.15
2002	9.67	9.73	9.51	5.15	6.15

Table 11

Average Wage, Study Direct Care Employees and Selected Occupations, Delaware	1995	1997	1998	2000	2001
Child Care Workers	5.99	7.03	6.94	7.69	7.92
Cashiers	6.38	7.1	7.41	7.56	7.98
Retail Sales	7.46	8.12	8.81	9.58	10.07
Wait Staff	5.38	6.14	6.23	6.58	6.9
Maids/ Cleaners	6.28	7.02	7.2	7.54	8.11
Home Health Aides	8.22	8.25	8.68	8.93	9.16
Data Entry	8.56	9.35	9.43	10.78	11.22
General Office Clerks	9.64	10.18	10.29	10.67	11.06
Tellers	8.81	9.45	9.74	9.86	10.26
File Clerks	7.74	8.91	9.6	9.88	10.15

Source: Delaware Department of Labor

Figure 1

Average Wage, 2000

(Bar chart showing average hourly wages for: Wait Staff ≈7.00, Child Care ≈8.00, Cashiers ≈8.00, Cleaners ≈8.00, Home Health ≈9.25, Study ≈9.75, Retail ≈10.10, File Clerks ≈10.25, Tellers ≈10.35, General Office ≈11.20, Data Entry ≈11.50)
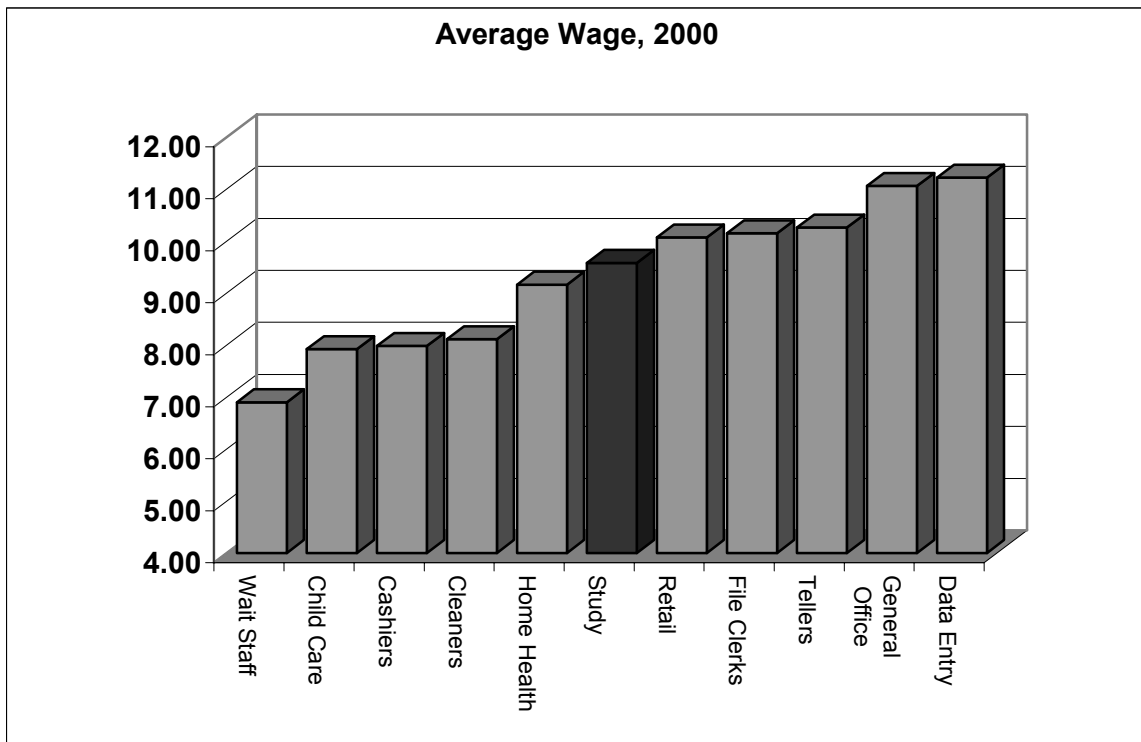
1. The initial hourly wage of DSW, given in column 1 in Table 10, is the average starting hourly wage among all providers for all newly hired DSW.

2. The initial hourly wage has risen, on average, by 3.5% per year between 1995 and 2002. However, this average annual increase does not consider an adjustment for the rate of inflation.

3. Column 2 shows the average hourly wage of DSW after their hiring. The difference between the average initial DSW and the average wage of a non-newly-hired DSW is very small, ranging from 8 cents to 12 cents an hour. This indicates that there may not be much wage growth for DSW that is attributed to their experience after they have obtained their position.

4. The hourly wage at the prior occupation of DSW are shown in column 3 of Table 8. These wage levels do not differ very much from the initial starting DSW wage. The wage differential does not appear to be a motivating factor of changing one's occupation to a DSW. This potential linkage will be explored in the final report

through a calculation of individual differences in DSW wages and wages of the prior occupation of DSW. In addition, other factors that contribute to seeking DSW employment will be examined.

5. Column 4 and 5 present respectively the national and the Delaware minimum (required) wage for each year of the DSW initial hourly wage.

6. Over the time frame, 1995 and 2002, the initial hourly wage of DSW has been approximately $2.50 to $3.00 higher than the Delaware minimum wage. Nevertheless, the amount of annual income earned by a DSW at the initial hourly wage is limited in all years, and for 2002 it was respectively $18,605 per year or $20,113 per year for a 37 hour and 40 hour work week.

7. Table 11 and Figure 1 allow a comparison of DSW initial hourly wage with wage levels in occupations that could compete with the DSW. The impact of competing wages of these alternative occupations are explored statistically in the next section.

B. Statistical Analyses of DSW Job Behavior

High separation rates of direct support workers employed to deliver services for individuals who are either the developmentally disabled and mentally retarded have prevailed over the past decade in many American states. This problem has occurred in Delaware as indicated by the above tables. Because of high turnover rates of DSW in state financed disability programs of many states, including Delaware, policy concerns have arisen over the quality and the continuity of care of developmentally disabled clients. As a consequence, in the recent literature of the disability service field, numerous articles have been concerned with the reasons for DSW tenure and retention, with particular attention directed at the role of DSW wages and benefits as sources of DSW behavior.

One focus of research has been on positing the causes of separation, especially the voluntary leaving by DSW. These conceptualizations have considered a range of explanations—psychological (e.g., stress, values), organizational (e.g., provider structure, authority patterns and responsibilities) and economic (e.g., wages and benefits). There

also have been several empirical studies that employ regression models to ascertain why DSW leave their positions. In addition, one empirical study has used a regression model to explain the wage levels of DSW since wages have been viewed as the central explanation of worker retention activities. These studies have relied on cross-sectional data of one time period, using <u>national</u> data in which the <u>unit of observation</u> is day care and/or residential care sites. The same unit of observation has been employed for several empirical studies that evaluate DSW retention/turnover within a state.

For all these studies, the selected dependent and independent variables in the analysis measure only the average value at each residential site. That is, these variables represent an aggregation of characteristics and dimensions that exist at the sites. For example, the dependent variable for tenure is the average longevity of all workers at a particular care facility. Such an approach, however, limits the ability to ascertain how varying levels or values of significant variables would influence or affect the behavior of worker with particular characteristics. For example, a change in average wages paid at a site could only predict average or gross impact on a proportion of all DSW separations but it does not clarify the specific reasons and the specific values of forces that impel certain types of <u>individuals</u> to make a separation decision. Moreover, the "average" approach does not permit the evaluation of certain (categorical) variables, which measure DSW demographic characteristics that could directly affect DSW retention decisions. For instance, the proportion of DSW of different racial groups or gender at a site may verify whether the composition of a workforce and its size is associated with turnover; but it does not allow determination of whether the race or gender of an individual DSW influences his/her decisions to remain at or leave the DSW job.

The approach taken here to explain tenure and retention of DSW in developmental disabilities services in Delaware differs from prior research. First, the unit of observation is not the characteristics of sites but rather the individual DSW. This allows the assessment of the impact of specific individual characteristics such as race gender, education, age and marital status on separation decisions and wages. Second, rather than relying on cross section data, pooled time-series and cross section data are utilized. This orientation permits the evaluation of how changes in various dimensions

over time (time-series data) affect DSW behavior as well as how individual DSW behavior varies because of different provider dimensions (cross-section data). Third, insight into separation and wages are drawn from the field of labor economics, which has a considerable history of theory and empirical studies that can guide rigorous analysis of workforce activities and conditions. Labor economics has provided the formulation of the econometric (statistical) models and the selection and interpretation of variables that could account for DSW actions. A basic premise of labor economics literature is that tenure and retention and wages are intertwined, each impacting upon the other. Fourth, if they are robust when tested[1]--as have been confirmed in the present study--, the econometric models of retention, tenure, and wage outcomes should provide the capability to predict accurately the impact of (statistically) significant policy variables (i.e., variables that can be manipulated in their values) on the separate outcomes.

THE CENTRAL POLICY ARGUMENTS

The central policy argument is that retention and tenure of DSW in Delaware is due to their wage levels and the extent of the benefits that they receive. Conversely, as stated in the labor economics literature, the value of wages received by (DSW) employees is also influenced by worker tenure. Put differently, the extent to which DSW are compensated for their tenure, as reflected by the impact of tenure on wage payments, can indicate whether wage remuneration is an adequate incentive for remaining as a DSW. If these relationships are affirmed, then these two factors (or policy variables) could be adjusted (increased as would be expected) to enhance the retaining of DSW. The hypothesis that employment benefits determine commitment of DSW to their present employer could not be tested however. Most types of benefits were very similar or identical among providers and thus could not be evaluated. Some types of benefits were examined but proved to be correlated with other important determinants of tenure and

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[1]An econometric model or equation is robust if its statistical results confirm expected relationships between the independent variable and the dependent variable, in this case retention, tenure or wages. Robustness is manifested by statistically significant relationships that account for a considerable amount of the variation (or differences) in the dependent variable(s).

retention as well; therefore the variables representing benefits have been excluded form the equations.

Of course, while these arguments point out the main hypotheses of the present study, other variables could be responsible for separation decisions, and some of these variables could be amenable to change by managerial and/or governmental actions. The other variables can be categorized as socioeconomic characteristics of DSW, organizational characteristics of provider worksites and working conditions, as well as external organizational of economic conditions and forces.

The central arguments of separation and wages and the impact of other potential determinants can be verified by formulating separate regression models (or equations) for tenure, retention, and wage levels, which are dependent variables. The measurement of these dependent variables is presented on Table 12.

Table 12

Dependent Variables of Separate Equations		
Variable and Its Name	Variable Definition	Variable Measurement
Tenure (TENURE)	Length of DSW service with a particular provider	Natural Log of tenure measured in months of service
Retention (RETENTION)	Three categories: 1. Still employed 2. Resigned 3. Terminated	Resigned = 1 vs. Still employed = 0, Resigned = 1 vs. Terminated = 0, Terminated vs. Still Employed = 0
Current Wage (CWAGE)	Wage paid to DSW in the present year	Natural log of current wages measured in dollars
Initial Wage (IWAGE)	Wage paid to DSW at hiring	Natural log of initial wages measured in dollars

The four basic models or equations that have been tested are:

(1) $\text{TENURE} = B_0 + B_1\text{CWAGE} + B_2\text{BENEFITS} \ldots.+ B_n X_n$

(2) $\text{RETENTION} = B_0 + B_1\text{CWAGE} + B_2\text{BENEFITS} + B_3\text{TENURE}\ldots.+ B_n X_n$

(3) $\text{CWAGE} = B_0 + B_1\text{EDUC} + B_2\text{EXPER} + B_3\text{EXPER}^2 + B_4\text{TENURE}\ldots.+ B_n X_n$

(4) $\text{IWAGE} = B_0 + B_1\text{EDUC}+ B_2\text{EXPER} + B_3\text{EXPER}^2 + B_4\text{TENURE} \ldots.+ B_n X_n$

Where:

the variables on the left side of the = sign are the dependent variables as defined on Table 13,

EDUC is the education level of a DSW,

BENEFITS is the employee benefits received by a DSW,

EXPER is the work experience of DSW prior to DSW job.

X_n are independent variables (family or child characteristics) hypothesized to explain the differences on an issue as measured by responses to a survey question, and

B_0 through B_n are regression parameters/coefficients that indicate the extent of the impact of the independent variables.

All models have a set of independent variables on the right hand side of the equation, i.e., the right side of the = sign. The independent variables represent hypotheses that are tested with the estimation of a particular model. A hypothesis provides an explanation for the expected/predicted relationship between an independent variable and the dependent variable. Put differently, a hypothesis clarifies why a social, or characteristic or factor would influence DSW separation or wages. Hypotheses and thus the independent variables of a regression model are not the same for all issues. Although the regression models will differ in the composition of their independent variables, there is a common set of independent variables on the right hand side of all the equations. These variables and their measurement are shown in the Table 13. The tables indicates which variables are included in the RETENTION WAGE, OR TENURE equations

Table 13

Variable	Variable Measurement and Name	CWAGE	IWAGE	RETENTION	LTENURE	Variable Measurement and Name*	Variable Measurement	CWAGE	IWAGE	RETENTION	LTENURE
						Common Set of Independent Variables Used in the Various Equations					
Gender	FEMALE = 1 Male =0	Y	Y	Y	Y	Type of Employment	FULL TIME = 1 ONCALL = 1 Part time = 0	Y	Y	Y	Y
Race	MINORITY = 1 White = 0	Y	Y	Y	Y	Promotion while in DSW service	PROMOTION = 1 No promotion = 0	Y	N	Y	Y
Education	COLLEGE = 1 SOME COLLEGE = 1 High School or less = 0	Y	Y	Y	Y	Jobs prior DSW job	JOBS: count of the number of prior jobs preceding DSW job	Y	Y	Y	Y
						Work load requirement	Ratio of clients to caregiver	Y	Y	Y	Y
Marital Status	SINGLE (single and divorced = 1 Married = 0	Y	Y	Y	Y	Tenure or job longevity of DSW at a provider	TENURE: number of consecutive months DSW employed by a provider	Y	N	Y	N
Caregiver	CAREGIVER = 1 Supervisor = 0	Y	Y	Y	Y	Work Experience Prior to DSW Job	YEARALL: Years of Prior Work Experience	Y	Y	Y	Y
County of provider site	NCC (New Castle) = 1 Other (Sussex of Kent) = 0	Y	Y	Y	Y	Work Experience Prior to DSW Job Squared	YEARALL2: Years of Prior Work Experience Squared	Y	Y	N	N
						Current Wage	CURWAGE: current hourly wage of DSW in dollars	N	N	Y	Y
Work experience in counseling prior to DSW job	COUNSEL = 1 Other = 0	Y	Y	Y	Y	Unemployment Rate	UNEMPL. RATE: Monthly unemployment rate in Delaware lagged one month behind the dependent variable	Y	Y	Y	Y
Retail Wage	RETAIL WAGE: Average Wage paid in the retail sector in the same month of the dependent variable	Y	Y	Y	Y	Service Wage	SERVICE WAGE: Average Wage paid in the retail sector in the same month of the dependent variable	Y	Y	Y	Y

*Upper case indicates the name of the variable in the equation

Two different types of regression models and estimation have been employed. The type of model used, and thus the type of estimation undertaken was based on the measurement of the dependent variable. The following models and estimations that have been utilized are presented in Table 14.

Table 14

Models of Regression Employed in the Analyses			
Type of Model	Measurement of Dependent Variable	The Dependent Variable	Model
Ordinary Least Squares (OLS)	Variable with interval scale	LTENURE CWAGE IWAGE	Equations 1, 3, 4
Multi-nominal logistic analysis	Multiple mutually exclusive categories	RETENTION	Equation 2

An independent variable can be concluded to have an impact on a dependent variable if the particular independent variable is statistically significant at the .05 level of significance, (p. < .05). Since the dependent variables are measured in natural logs (for testing LTENURE, IWAGE and CWAGE), the value of a statistically significant coefficient can be interpreted for the OLS equations in one of two ways. If the independent variable is measured as an interval scale, -- e.g., CWAGE, hourly wage in dollars, -- the coefficient would indicate the percentage change in the dependent variable that would occur with an absolute change of one unit (a dollar) in the independent variable. If the independent variable is categorical variable, -- e.g., caregiver (= 1) or not (= 0), -- the coefficient would indicate the percentage difference in the dependent variable that would occur with one category versus the other. For example, in the LTENURE model (equation 1), if the independent variable CWAGE were found to be statistically significant with a coefficient of .20, then a one dollar change in the hourly wage would yield a 20 percent change in DSW tenure. This would indicate that tenure is very responsive to wage levels. The independent variables in the estimated equation, if statistically significant, can be interpreted in a similar way for the models of binary logistic analysis and multinomial logistic analysis, and cumulative logistic analysis. The estimated regression coefficients yield odds ratio[2] that indicates the comparative probability of an occurrence of the dependent variable based on the value of the independent variable. Some examples regarding the dependent variable of RETENTION1 can illustrate a concrete interpretation to a statistically significant coefficient. If a categorical independent variable, say RESIDENTIAL, has a positive sign and a coefficient with an odds value of 2, then residential caregivers have 2 times the

odds of day care caregivers, as the reference category, to separate from a DSW job. Alternatively, residential caregivers are twice as likely to leave DSW jobs as day care caregivers. If an independent variable with an interval scale, e.g., wages in dollars, produced an odds ratio of 1.5 with a positive sign, then for every unit increase in the independent variable, $1.00 in wages per hour, the odds of retaining the DSW would increase by 50% (1.50-1.00 or 150%-100%).

Because of the mathematical complexity of the equations and because their interpretations are not readily accessible to most readers, all estimated equations and their relevant statistical results are shown in an appendix. Technical dimensions of the various models and their analyses are confined to footnotes and citations. The statistical results are reported in the form of general statements of what (independent) variables/factors are significant determinants of issue differences (the dependent variable).

TENURE: THE LTENURE MODEL, EQUATION 1

Equation 1: $LTENURE = B_0 + B_1\, PWAGE + B_2\, Benefits \ldots B_n X_n$

A central hypothesis of this model is that the level of current wages paid to DSW influences their job longevity, i.e., tenure, with a provider. The implication of such a positive relationship is that higher wages would extend the length of time that DSW would remain at their work position. Conversely, the positive relationship of tenure and wages indicates that low wage levels account for DSW separating from their present job.

Findings:

1. Current wages (CWAGE) were found to be a statistically significant variable, positively related to LTENURE. That is, along with other variables, the current wage level paid to DSW determines their length of service with a provider. The regression coefficient has a value of .378. These results indicate that a $1.00 increase per hour in current wages would produce an extension of the tenure (in months) of DSW by 37.8% beyond their current level.

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[2]An estimated coefficient initially produces a probability estimate that must be transformed into odds ratio.

2. Race (Minority) was not statistically significant. White and minority DSW have approximately the same job longevity of service.

3. The tenure of female DSW (FEMALE) is 10% less than that of male DSW.

4. DSW with college degrees (COLLEGE) have a tenure of 55% shorter than DSW with high school education, but surprisingly, DSW with some college education (SOME COLLEGE) stay 16% longer in their DSW jobs than high school or less educated DSW.

5. Marital status (MARITAL) affects the length of service. The tenure of single individuals is 23% less than married and divorced DSW.

6. Direct caregivers (CAREGIVERS) manifest a tenure that is 97% longer than supervisory DSW.

7. DSW working at provider sites in New Castle County (NCC) have a tenure that is 38% shorter than their counterparts in the other counties.

8. The job longevity of full-time (FULLTIME) employees is 38% shorter than part-time workers, but on-call workers (ONCALL) tenure is 38% higher than part-time workers. Thus the tenure of on-call employees of a provider is 76% greater than full-time DSW.

9. DSW with more prior non-DSW work experience (EXPER) have lower tenure. For every year of prior non-DSW work, employees' service commitment decreases by 1%.

10. DSW who held counseling jobs before becoming a DSW (COUNSEL) remain on the job 14% longer than DSW who held other types of prior jobs.

11. DSW who have been promoted (PROMOS) have shorter tenure than DSW who are not promoted. More specifically, for each promotion a DSW reduces his /her job commitment by 9%. This may indicate that upwardly mobile DSW are more talented and ambitious and utilize their promotions to advance themselves to higher paying jobs in non-DSW work.

12. The greater the number of jobs (JOBS) held in the three years prior to assuming a DSW positions produces less tenure. That is, for every job held prior to their DSW position, a DSW employee decreases his tenure commitment by 34%.

13. The ratios of clients (or beds) to a DSW position at a provider site (BED RATIO) influences the length of service of DSW. More specifically, where the ratio is higher, DSW remain longer at their position.

14. The unemployment rate (UNEMPL RATE) has considerable and positive impact on DSW tenure. Higher unemployment rates are associated with more job longevity. Conversely, lower unemployment rates are correlated with shorter tenure. A major implication is that DSW are less likely to leave their jobs when higher unemployment prevails because there are fewer alternative jobs.

15. Current wages in competing occupations have substantial impact on DSW tenure. Higher wages in either the retail (RETAIL WAGE) or service (SERVICE WAGE) sectors are associated with shorter DSW job longevity. Put differently, DSW has shorter job commitment when the wages are greater in the retail and service fields.

RETENTION: EQUATION 2

Equation 2: RETENTION = B_0 + B_1CWAGE + B_2TENURE…..Bonn.

Because the major concern is why DSW voluntarily separate from their positions, the focus is upon the differences of DSW who have resigned compared to DSW who are still employed.

Findings: Resigned vs. Still Employed

The tested retention equations strongly support the findings regarding DSW tenure. Most significantly, wages play a central role in the separation decisions of DSW.

1. At lower current wage levels (CWAGE), DSW are more likely to leave their support job than when their current wage is higher.

2. The size of competing wages in other occupational sectors (RETAIL WAGE, or SERVICE WAGE) is a strong influence on resignation. As competing wage levels rise in the retail and service sectors, the probability of resignation, in fact, decreases. What this seemingly surprising result may indicate is that providers are attuned to wage competition of other (and competitive) occupations and are raising their current wage to compensate for the competition. This result and interpretation is congruent with the findings with respect to the CWAGE and IWAGE models presented below.

3. The length of service (TENURE) is not a predictor of resignation from DSW positions.

4. The unemployment rate a month preceding a resignation decision (UNEMPL RATE) does not influence that decision.

5. Employees with more prior non-DSW work experience (EXPER) are less likely to separate from their DSW jobs.

6. Males (GENDER), minorities (MINORITY), and single (MARITAL STATUS) manifest a lower probability of resignation than females, Caucasian employees and married DSW.

7. DSW with some college education (SOME COLLEGE) are (3 times) less likely give their resignation than DSW with either a college degree (COLLEGE) or a high school education. The latter two groups are equally likely to remain in DSW compared to the former group.

8. Supervisory personnel have a greater probability of resignation than their support workers (CAREGIVER).

9. DSW who work in site in New Castle County (NCC) have a greater likelihood of resignation than DSW working at provider sites in the other counties.

10. Part-time DSW are more likely to leave their DSW positions than full-time (FULLTME) and on-call (ONCALL) DSW. More specifically, full-time workers will remain 2.7 as long as part-time workers and on-call will remain 15 times longer then part-time workers.

11. DSW who were employed in a prior counseling occupation (COUNSEL) are more likely to resign (1.7 times more) than DSW with different job experience.

12. The increasing number of promotions (PROMOS) that a DSW receives is associated with a lesser probability of resignation.

13. There is greater likelihood of leaving a DSW position if an employee held a greater number of jobs in the past three years prior to taking a DSW position (JOBS).

14. Where DSW have worked with higher bed (or clients) to worker ratio, the probability of resignation declines.

CWAGE and IWAGE: EQUATIONS 3 and 4

Equation 3: $CWAGE = B_0 + B_1 EDUC + B_2 EXPER + B_3 EXPER^2 + B_4 TENURE.....B_n X_n$

Equation 4: $IWAGE = B_0 + B_1 EDUC + B_2 EXPER + B_3 EXPER^2 + ...B_n X_n$

Findings:

The regressions encompassed by equations 4 and 5 are known as the Mincer equation in labor economics. The equation includes three major variables that are hypothesized as producing wage levels among workers. The specific propositions as they

pertain to DSW are as follows. First, larger wage levels should be related to the amount of formal education (EDUC) of a DSW. Second, wages are expected to rise for workers according to the number of years of prior DSW work experience (EXPER), but at some "high" level of experience the wage level should start to decline because a decreasing productivity EXPER2). Third, wages should be higher for greater longevity of DSW service (TENURE). The size of the regression coefficients for EDUC, EXPER, EXPER2, and TENURE indicate the return to the DSW for their prior work experience and DSW length of service. If the coefficients are small, then the statistical results will support the view that wages are a key factor in retaining individuals.   If the predicted relationships are statistically insignificant, the conclusion is that the providers are not compensating DSW for either past work effort or DSW longevity.

Initial Wage (IWAGE):

       The IWAGE model affirms the Mincer equation in which education and past work experience of DSW are compensated by providers.

1. College graduates (COLLEGE) receive are paid a higher initial wage of approximately 6% higher then high school graduates, and DSW with some college education (SOME COLLEGE) are paid approximately 3.2% higher initial wage than high school graduates.

2. Newly hired workers are compensated 0.7% increase in initial wage for each year of non-DSW work experience (EXPER), but this increasing percentage compensation begins to decline for those who have 22 years of experience.

3. For every dollar paid for last wage (LASTWAGE), newly hired DSW receive approximately 0.6% higher for their initial wage.

4. The wage level in competing occupations (RETAIL WAGE, SERVICE WAGE) is considered in the awarding of the DSW initial wage. For every dollar in wages, on average, in the retail sector, newly hired DSW are paid approximately 7% higher for their initial wage.

5. Newly-hired employees who had counseling as their prior occupation (COUNSEL) are not paid a premium in their initial wage; that is, newly-hired DSW who do not have a counseling backgrounds are not "penalized", i.e., receive

a lower initial wage, because their work experience is less compatible with DSW job requirements.

6. Direct service workers (CAREGIVERS) are paid 14.8% less in their initial wage than are individuals who hired at supervisory level.

7. Full-time employees (FULLTIME) receive 2.3% higher initial wage then part-timers, but and (ONCALL) workers on average are paid 8.6% less in their initial wage then part-time newly hired workers.

8. DSW hired for provider sites in New Castle County (NCC) are the recipients of a 10.9% premium compared to newly-hired workers at sites in non- New Castle County.

9. Newly-hired DSW receive an initial wage rate that is 6% less as the beds (or client) ratio (BED RATIO) is less.

10. The unemployment rate in the month prior to hiring DSW (UNEMPL RATE) does not influence the initial wage paid to new hires.

Current Wage (CWAGE):

1. DSW with a BA or greater (COLLEGE) receive a 7.9% higher current wage than DSW with either some college (SOME COLLEGE) or only a high school education.

2. DSW working in New Castile County (NCC) provider sites have 8.8% higher current wage than DSW holding positions a provider site located outside New Castile County.

3. Supervisors are paid 17% higher wages than workers who provide direct services (CAREGIVER).

4. The current wage of full-time (FULL-TIME) DSW is 2.8% higher than both on-call (ONCALL) and part-time workers.

5. DSW who obtain promotions receive 8.9% increase in their current wage for each promotion.

6. The current wage 3% lower for each difference in the bed (or client) ratio (BED RATIO). That is, with a lower ratio, DSW receive higher wage compensation.

7. The unemployment rate (UNEMPL RATE) does not have any decipherable impact on current wages.

8. As the retail wage gets higher, so does the current wage. For every dollar increase in retail wage (RETAIL WAGE), the DSW current wage rises by 8.1%. Likewise, for service wage, there is a 16% rise in the current wage. This may indicate that providers are attempting to keep up with competition, but given the retention rate it must be inadequate.

9. Present employees only receive small compensation in their current wages for their prior non-DSW work experience (EXPER). That is, they obtain only 0.5% higher current wage for the each year they worked previous to their DSW job.

10. However, providers appear to be compensating employees for their length of services as a DSW (TENURE). For every year of tenure, DSW receive a 5.5% return in form of wage increases. Nevertheless, while this annual average increment is seemingly sizeable, it appears to be insufficient to retain DSW as evidenced by the low retention rate and short tenure of DSW, which was reported in the second section of this report.

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APPENDIX

List of Appendix Tables

Appendix Table 1

Variables of Collected Data	
ID	Full Time in 2000?
Provider	Full Time in 1999?
Employee First Name	Full Time in 1998?
Employee Last Name	Benefit Package
Initial Start Date	Initial Package
Primary Facility	Initial Wage
Birth date	Wage in 2002
Gender	Wage in 2001
Race	Wage in 2000
Education Level	Wage in 1999
Marital Status	Wage in 1998
Has children?	Number of Hours Worked Per Week
Number of Children	Shift
Working Spouse	Overtime Worked
From Merged Company	Overtime Salary
Occupation – Present	Overtime Hours
Occupation – Initial Hire	Last Promotion Date
Secondary Facility	Promotions in 2002
Previous Facility and Date	Promotions in 2001
Previous Facility and Date 2	Promotions in 2000
Years of Experience in Support Work	Promotions in 1999
Years of Work Experience	Promotions in 1998
Continually Employed for Last Year	Termination Date
How many jobs had?	Reason for Leaving
Crime Background	Alternative Employment
Occupation of Last Employment	Rehire Date 1
Employer of Last Employment	Rehire Date 2
Full Time or Part Time When Hired	Comment 1
Full Time in 2002?	Employee's Last Wage
Full Time in 2001?	Foreign Employee

Appendix Table 2

	1998	1999	2000	2001	2002	Total		1998	1999	2000	2001	2002	Total
Demographic Profile of All (Residential and Day Care) DSW by Year of Hire*													
	#	#	#	#	#	#		%	%	%	%	%	%
Gender													
Female	79	111	211	189	108	907		55	65	68	68	68	65
Male	65	60	101	89	50	487		45	35	32	32	32	35
Race													
Caucasian	27	47	71	78	40	349		20	28	23	29	26	27
African American	108	119	231	178	110	939		78	71	76	67	71	71
Other	3	1	2	9	4	28		2	1	1	3	3	6
Unknown	5	4	4	13	4	78		-	-	-	-	-	-
Education													
Less than H.S.	0	1	3	0	1	8		0	1	1	0	1	1
H.S.	37	53	85	86	42	398		27	33	31	33	32	32
Some College	74	81	137	118	65	614		54	50	49	46	50	49
BA and above	25	26	52	55	23	241		18	16	19	21	18	19
Unknown	8	10	35	19	27	133		-	-	-	-	-	-
Age													
17-20 years	4	6	19	12	4	55		3	4	6	4	3	4
21-25 years	34	48	64	57	31	296		24	29	21	21	20	22
26-35 years	60	58	110	81	67	487		43	35	36	30	44	36
36-45 years	30	29	64	59	29	294		22	18	21	22	19	22
46-55 years	8	18	42	43	19	167		6	11	14	16	12	12
56-65 years	3	6	4	18	3	43		2	4	1	7	2	3
over 65 years	0	0	1	1	0	8		0	0	0	0	0	1
Unknown	5	6	8	7	6	44		-	-	-	-	-	-
Marital Status													
Single	95	107	181	162	82	791		68	67	64	67	61	63
Married	44	53	102	81	52	461		32	33	36	33	39	37
Unknown	5	11	29	35	24	142		-	-	-	-	-	-

*The totals include DSW hired before 1998.
2002 does not include a full year of data

	1998	1999	2000	2001	2002	Total		1998	1999	2000	2001	2002	Total
Demographic Profile of Residential DSW by Year of Hire*													
	#	#	#	#	#	#		%	%	%	%	%	%
Gender													
Female	71	100	180	169	103	814		62	74	73	77	84	74
Male	44	36	67	51	20	286		38	26	27	23	16	26
Race													
Caucasian	12	24	41	51	20	189		11	18	17	24	17	18
African American	97	109	200	151	96	823		87	81	82	72	80	79
Other	3	1	2	9	4	28		3	1	1	4	3	3
Education													
Less than H.S.	0	1	2	0	1	7		0	1	1	0	1	1
H.S.	22	41	72	63	40	310		20	31	30	29	34	29
Some College	68	69	128	109	58	559		61	53	54	51	49	53
BA and above	21	20	36	42	19	186		19	15	15	20	16	18
Age													
17-20 years	4	6	19	12	4	55		4	5	6	3	3	5
21-25 years	33	42	54	46	25	259		30	32	22	21	21	24
26-35 years	49	46	85	64	52	390		44	35	30	44	44	37
36-45 years	19	22	48	46	23	216		17	17	22	19	19	20
46-55 years	6	13	29	31	11	111		5	10	12	14	9	10
56-65 years	0	4	3	14	3	28		0	3	1	7	3	3
over 65 years	0	0	1	1	0	3		0	0	0	0	0	0
Marital Status													
Single	77	88	154	144	75	671		69	69	67	70	65	66
Married	34	40	76	61	40	352		31	31	33	30	35	34

*The totals include DSW hired before 1998.

2002 does not include a full year of data

Appendix Table 4

Demographic Profile of Day Care (Non- Residential) DSW by Year of Hire*													
	1998	1999	2000	2001	2002	Total		1998	1999	2000	2001	2002	Total
	#	#	#	#	#	#		%	%	%	%	%	%
Gender													
Female	8	11	31	20	5	93		28	31	48	35	14	32
Male	211	24	34	38	30	201		72	69	52	65	86	69
Race													
Caucasian	15	23	30	27	20	160		58	70	49	50	59	58
African American	11	10	31	27	14	116		42	30	51	50	41	42
Other	0	0	0	0	0	0		0	0	0	0	0	0
Education													
Less than H.S.	0	0	1	0	0	1		0	0	3	0	0	1
H.S.	15	12	13	23	2	88		60	40	33	51	15	44
Some College	6	12	9	9	7	55		24	40	23	20	54	28
BA and above	4	6	16	13	4	55		16	20	41	29	31	28
Age													
17-20 years	0	0	0	0	0	0		0	0	0	0	0	0
21-25 years	1	6	10	11	6	37		4	19	15	19	17	13
26-35 years	11	12	25	17	15	97		39	38	38	30	43	34
36-45 years	11	7	16	13	6	78		39	22	25	23	17	27
46-55 years	2	5	13	12	8	56		7	16	20	21	23	19
56-65 years	3	2	1	4	0	15		11	6	2	7	0	5
over 65 years	0	0	0	0	0	2		0	0	0	0	0	2
Marital Status													
Single	18	19	27	18	7	120		64	59	51	47	36	52
Married	10	13	26	20	12	109		36	41	49	53	63	48

*The totals include DSW hired before 1998.

2002 does not include a full year of data

Appendix Table 5

Region Differences of DSW		
Dependent Variable: NCC = 0, Non-NCC = 1		
	Coefficient	Significance
Gender		
Female	.6417	<.0001
Male	Reference	Reference
Race		
Minority	-.2729	.0697
Caucasian	Reference	Reference
Education		
Some College	-.3812	.0106
BA and above	-.6784	.0008
High School and below	Reference	
Age		
17-20 years	.1587	.7279
21-25 years	-.5765	.1313
26-35 years	-.4128	.2591
36-45 years	-.2734	.4666
46-55 years	.1256	.7483
56-65 years	Reference	Reference
over 65 years	Reference	Reference
Marital Status		
Single	-.2233	.1180
Married	Reference	Reference

Appendix Table 6

Direct Support Workers - Industry of Last Employment By Region						
Industry	*NCC*		*Non-NCC*		Total	
	#	%	#	%	#	%
Banking	31	4	18	6	49	4%
Building Services	18	2	4	1	22	2%
Child Care	12	2	4	1	17	2%
Construction	6	1	2	1	8	1%
Eating/Drinking Establishments	26	3	15	5	42	4%
Education	27	3	11	4	39	3%
Government	42	4	21	7	63	6%
Health Industry (excl. hospitals)	95	12	30	10	128	11%
Hospitals	16	2	8	3	25	2%
Insurance	3	<1	4	1	7	1%
Manufacturing	26	3	24	8	51	5%
Miscellaneous	1	<1	1	<1	2	0%
Religious	9	1	3	1	12	1%
Residential Care	277	35	78	25	363	33%
Retail	46	6	26	8	77	7%
Service-Miscellaneous	79	10	25	8	105	9%
Social Services	27	3	5	2	32	3%
Temporary Agency	35	4	28	9	63	6%
Transportation	6	1	1	<1	7	1%

Finance = banking and insurance.
Health = health industry, and hospitals.
Residential Care = Residential Care.
Retail = retail, eating/drinking.
Service = Service miscellaneous, Temp Agency, Building Services.
Miscellaneous = miscellaneous, construction, manufacturing, transportation.
Social Services = child care, education, religion, social services.

Appendix Table 7

Regional Differences in Industry of Last Employment of DSW		
New Castle = 0; Non-New Castle = 1		
Industry	Coefficients	Significance
Finance	-.1041	.7780
Health	-.7409	.0172
Residential Care	-.9361	.0008
Service	-.5087	.0836
Retail	-.2320	.4624
Government	-.3621	.3204
Social Services	-.8509	.0133
Miscellaneous	Reference	Category

Finance = banking and insurance.
Health = health industry, and hospitals.
Residential Care = Residential Care.
Retail = retail, eating/drinking.
Service = Service miscellaneous, Temp Agency, Building Services.
Miscellaneous = miscellaneous, construction, manufacturing, transportation.
Social Services = child care, education, religion, social services.

Appendix Table 8

Year Hired	# of Hires	Still Employed As of 2002		Number of Separations: Resignations and Terminations					
		#	%	1997	1998	1999	2000	2001	2002
1984	3	2	67	0	0	0	0	0	1
1986	1	1	100	0	0	0	0	0	0
1987	2	2	100	0	0	0	0	0	0
1988	2	1	50	0	1	0	0	0	0
1989	11	4	36	0	1	2	3	1	0
1990	7	2	29	0	2	1	1	1	0
1991	7	2	29	0	1	1	3	0	0
1992	7	1	14	0	2	3	1	0	0
1993	8	1	13	0	1	1	4	0	1
1994	29	11	38	0	4	4	7	2	1
1995	22	6	27	0	5	2	5	2	2
1996	34	14	41	1	8	4	4	3	0
1997	92	15	16	3	36	13	18	7	1
1998	107	22	21	0	23	31	21	10	0
1999	112	23	21	0	0	30	36	17	6
2000	231	64	28	0	0	0	69	68	29
2001	179	92	51	0	0	0	0	54	32
2002	106	80	75	0	0	0	0	0	26
Total for NCC	960	343	36						
Missing: 2 Data collected for 2002 was not for the complete year.									

Appendix Table 9

Residential and Day Care DSW in NNCC- Employment Status by Year of Hire

Year Hired	# of Hires	Still Employed As of 2002		Number of Separations: Resignations and Terminations					
		#	%	1997	1998	1999	2000	2001	2002
1984	2	2	100	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	3	3	100	0	0	0	0	0	0
1988	3	2	67	0	0	1	0	0	0
1989	6	3	50	0	0	3	0	0	0
1990	6	5	83	0	0	0	0	1	0
1991	4	2	50	0	1	0	0	1	0
1992	8	5	63	0	2	0	1	0	0
1993	5	3	60	0	1	0	1	0	0
1994	13	7	54	2	0	1	2	1	0
1995	11	5	45	0	2	3	0	1	0
1996	9	3	33	0	2	1	3	0	0
1997	30	6	20	0	10	5	6	3	0
1998	33	6	18	0	3	15	5	4	0
1999	53	11	21	0	0	15	23	4	0
2000	78	23	29	0	0	0	28	22	5
2001	95	48	50	0	0	0	0	28	18
2002	50	36	72	0	0	0	0	0	4
Total for NNCC	409	170	42						
Missing: 2 Data collected for 2002 was not for the complete year.									

Appendix Table 10

Year Hired	# of Hires	Still Employed As of 2002		Number of Separations: Resignations and Terminations					
Residential DSW - Employment Status by Year of Hire									
		#	%	1997	1998	1999	2000	2001	2002
1984	2	2	100	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	4	4	100	0	0	0	0	0	0
1988	3	2	67	0	0	1	0	0	0
1989	13	7	54	0	1	3	1	1	0
1990	10	5	50	0	1	1	1	2	0
1991	7	3	43	0	1	0	2	1	0
1992	9	4	44	0	3	1	1	0	0
1993	8	2	25	0	2	1	3	0	0
1994	36	16	44	2	4	5	6	2	1
1995	24	8	33	0	4	4	5	2	1
1996	37	17	46	1	8	4	4	3	0
1997	106	22	21	3	42	16	15	8	1
1998	115	23	20	0	22	37	21	12	0
1999	136	31	23	0	0	43	41	15	6
2000	247	81	33	0	0	0	68	72	25
2001	220	121	55	0	0	0	0	63	35
2002	123	93	76	0	0	0	0	0	30
Total for residential									
Missing: 2 Data collected for 2002 was not for the complete year.									

Appendix Table 11

Year Hired	# of Hires	Still Employed As of 2002		Number of Separations: Resignations and Terminations					
		#	%	1997	1998	1999	2000	2001	2002
1984	3	2	67	0	0	0	0	0	1
1986	1	1	100	0	0	0	0	0	0
1987	1	1	100	0	0	0	0	0	0
1988	2	1	50	0	1	0	0	0	0
1989	4	0	0	0	0	2	2	0	0
1990	3	2	67	0	1	0	0	0	0
1991	4	1	25	0	1	1	1	0	0
1992	6	2	33	0	1	2	1	0	0
1993	5	2	40	0	0	0	2	0	1
1994	6	2	33	0	0	0	3	1	0
1995	9	3	33	0	3	1	0	1	1
1996	6	0	0	0	2	1	3	0	0
1997	22	2	9	0	5	3	10	2	0
1998	29	5	17	0	4	11	6	3	0
1999	35	4	11	0	0	4	20	6	1
2000	65	8	12	0	0	0	29	18	10
2001	58	22	38	0	0	0	0	20	15
2002	35	25	71	0	0	0	0	0	10
Total for non residential									
Missing: 2 Data collected for 2002 was not for the complete year.									

Appendix Table 12

Year	A.. No. of Positions	B. Instability Rates*		C Hires		D. Vacancies	
		No.	%	No.	%	No.	%
1998	236.75	24	10	42	18		
1999	257.75	40	16	63	24		
2000	326.47	66	20	129	40		
2001	337.87	107	32	114	34		
2002**	345.46	44	13	58	17		
Avg.	289.71	56.2	19	81	28		

*Data for 2002 is for 6 months.
**

An indication that wages and/or benefits could be a basis for DSW job instability can be seen in table 10 on the job behavior among DSW. The multiple jobs holding of DSW in both DSW jobs and non-DSW jobs is presented in Part A. These estimates understate the actual number and proportions of DSW with other jobs since the data was not always complete. Part B yields a perspective on DSW who have separated from one disability service provider so as to join another disability service provider. Again, the impact of such behavior is limited by the number of providers included in the study.

Appendix Table 13

Job Behavior Among DSW						
A. Multiple job holdings as a DSW						
	Single Job		Multiple Jobs		Total	
	No.	%	No.	%	No.	%
1998	101	86	16	14	117	100
1999	128	88	17	12	145	100
2000	231	89	29	11	260	100
2001	516	96	8	4	224	100
2002	117	98	3	2	120	100
Total	793	92	73	8	866	100
B. DSW Who Left One Provider For Another*						
	Workers who left DSW jobs		Workers who left to go to another provider		Total DSW Jobs	
	No.	%	No.	%	No.	%
1998	88	23	13	3	379	100
1999	117	27	11	3	437	100
2000	191	33	61	10	584	100
2001	193	31	25	4	625	100
**2002	108	19	6	1	556	100
Total						

*Only includes those employees for which this data was provided
**Incomplete data for 2002

The REG Procedure
Model: MODEL1
Dependent Variable: iniwageL – Log of Initial Wage

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	8.00232	0.50015	65.31	<.0001
Error	557	4.26523	0.00766		
Corrected Total	573	12.26755			

Root MSE		0.08751	R-Square	0.6523	
Dependent Mean		2.17154	Adj R-Sq	0.6423	
Coeff Var		4.02973			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1.66371	0.06078	27.37	<.0001
gender	1	0.00067983	0.00952	0.07	0.9431
race	1	-0.01394	0.01067	-1.31	0.1918
education (C)	*1*	*0.05513*	*0.01249*	*4.42*	*<.0001*
education (SC)	*1*	*0.03271*	*0.00860*	*3.80*	*0.0002*
marital stat	*1*	*-0.01531*	*0.00808*	*-1.90*	*0.0584*
county (kent)	*1*	*-0.10992*	*0.00856*	*-12.85*	*<.0001*
caregiver	*1*	*-0.14843*	*0.01230*	*-12.07*	*<.0001*
counsel	1	0.00254	0.00814	0.31	0.7553
Work Exper.	*1*	*0.00668*	*0.00178*	*3.76*	*0.0002*
*Work Exper.*2*	*1*	*-0.00020955*	*0.00006466*	*-3.24*	*0.0013*
fulltime	*1*	*0.02305*	*0.00896*	*2.57*	*0.0104*
unemployment	1	0.00031169	0.01157	0.03	0.9785
bed ratio	*1*	*-0.06667*	*0.01410*	*-4.73*	*<.0001*
retail wage	*1*	*0.07065*	*0.00550*	*12.84*	*<.0001*
oncall	*1*	*-0.08649*	*0.02721*	*-3.18*	*0.0016*
last wage	*1*	*0.00643*	*0.00154*	*4.19*	*<.0001*

Note: Bolded italicized variables are statistically significant.

The REG Procedure
Model: MODEL1
Dependent Variable: iniwageL – Log of Initial Wage

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	7.92699	0.49544	63.58	<.0001
Error	557	4.34056	0.00779		
Corrected Total	573	12.26755			

Root MSE		0.08828	R-Square	0.6462	
Dependent Mean		2.17154	Adj R-Sq	0.6360	
Coeff Var		4.06516			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	0.83415	0.11448	7.29	<.0001
gender	1	0.00350	0.00956	0.37	0.7148
race	1	-0.01534	0.01075	-1.43	0.1542
education (C)	*1*	*0.05584*	*0.01259*	*4.43*	*<.0001*
education (SC)	*1*	*0.02994*	*0.00866*	*3.46*	*0.0006*
marital stat	1	-0.01309	0.00812	-1.61	0.1078
county (kent)	*1*	*-0.11342*	*0.00859*	*-13.21*	*<.0001*
caregiver	*1*	*-0.14801*	*0.01241*	*-11.93*	*<.0001*
counsel	1	0.00295	0.00821	0.36	0.7196
work exper.	*1*	*0.00629*	*0.00179*	*3.51*	*0.0005*
*work exper*2*	*1*	*-0.00019009*	*0.00006525*	*-2.91*	*0.0037*
fulltime	*1*	*0.02572*	*0.00905*	*2.84*	*0.0047*
unemployment	1	-0.00463	0.01180	-0.39	0.6950
bed ratio	*1*	*-0.06407*	*0.01421*	*-4.51*	*<.0001*
service wage	*1*	*0.12815*	*0.01039*	*12.34*	*<.0001*
oncall	*1*	*-0.09463*	*0.02736*	*-3.46*	*0.0006*
last wage	*1*	*0.00684*	*0.00154*	*4.43*	*<.0001*

Note: Bolded italicized variables are statistically significant.

The REG Procedure
Model: MODEL1
Dependent Variable: curwageL – Log of Current Wage

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	18	5.11597	0.28422	30.61	<.0001
Error	304	2.82310	0.00929		
Corrected Total	322	7.93907			

Root MSE		0.09637	R-Square	0.6444
Dependent Mean		2.21031	Adj R-Sq	0.6233
Coeff Var		4.35986		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1.45794	0.10015	14.56	<.0001
gender	1	0.00821	0.01470	0.56	0.5770
race	1	-0.00491	0.01462	-0.34	0.7374
education (C)	1	0.07930	0.01748	4.54	<.0001
education (SC)	*1*	*0.02093*	*0.01266*	*1.65*	*0.0992*
marital stat	*1*	*-0.03000*	*0.01190*	*-2.52*	*0.0122*
county (kent)	*1*	*-0.08878*	*0.01403*	*-6.33*	*<.0001*
caregiver	*1*	*-0.17024*	*0.01561*	*-10.90*	*<.0001*
work exp.	*1*	*0.00488*	*0.00271*	*1.80*	*0.0721*
work exp*2	1	-0.00013124	0.00009498	-1.38	0.1680
tenure	*1*	*0.05270*	*0.00828*	*6.37*	*<.0001*
fulltime	*1*	*0.02763*	*0.01364*	*2.03*	*0.0437*
promotions	*1*	*0.08960*	*0.01855*	*4.83*	*<.0001*
counsel	1	0.01094	0.01267	0.86	0.3885
# jobs prior	*1*	*0.01577*	*0.00715*	*2.20*	*0.0283*
oncall	1	-0.02040	0.04381	-0.47	0.6418
bed ratio	*1*	*-0.03726*	*0.02148*	*-1.73*	*0.0838*
retail wage	*1*	*0.08113*	*0.01013*	*8.01*	*<.0001*
unemployment	1	0.02516	0.01861	1.35	0.1773

Note: Bolded italicized variables are statistically significant.

The REG Procedure
Model: MODEL1
Dependent Variable: curwageL – Log of Current Wage

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	18	5.05751	0.28097	29.64	<.0001
Error	304	2.88156	0.00948		
Corrected Total	322	7.93907			

Root MSE	0.09736	R-Square	0.6370
Dependent Mean	2.21031	Adj R-Sq	0.6155
Coeff Var	4.40477		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	0.50759	0.21152	2.40	0.0170
gender	1	0.00832	0.01485	0.56	0.5758
race	1	-0.00832	0.01476	-0.56	0.5736
education (C)	*1*	*0.07725*	*0.01767*	*4.37*	*<.0001*
education (SC)	1	0.01797	0.01279	1.41	0.1610
marital stat	*1*	*-0.02737*	*0.01203*	*-2.27*	*0.0236*
county (kent)	*1*	*-0.09433*	*0.01405*	*-6.71*	*<.0001*
caregiver	*1*	*-0.16925*	*0.01577*	*-10.73*	*<.0001*
work exper	*1*	*0.00472*	*0.00273*	*1.72*	*0.0855*
work exper*2	1	-0.00011447	0.00009600	-1.19	0.2341
tenure	*1*	*0.05174*	*0.00847*	*6.11*	*<.0001*
fulltime	*1*	*0.03306*	*0.01376*	*2.40*	*0.0169*
promotions	*1*	*0.09192*	*0.01876*	*4.90*	*<.0001*
counsel	1	0.01010	0.01279	0.79	0.4303
# jobs prior	*1*	*0.01435*	*0.00724*	*1.98*	*0.0482*
oncall	1	-0.03031	0.04426	-0.68	0.4940
bed atio	*1*	*-0.03777*	*0.02170*	*-1.74*	*0.0827*
service wage	*1*	*0.14712*	*0.01954*	*7.53*	*<.0001*
unemployment	1	0.02236	0.01909	1.17	0.2422

Note: Bolded italicized variables are statistically significant.

The REG Procedure
Model: MODEL1
Dependent Variable: ltenure – Log of Tenure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	17	2845.75930	167.39761	114.67	<.0001
Error	4512	6586.83641	1.45985		
Corrected Total	4529	9432.59571			

Root MSE	1.20824	R-Square	0.3017	
Dependent Mean	2.79041	Adj R-Sq	0.2991	
Coeff Var	43.29980			

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	1.28429	0.25666	5.00	<.0001
gender		1	*0.10225*	*0.04756*	*2.15*	*0.0316*
race		1	0.00635	0.05432	0.12	0.9069
education (College)		1	*-0.54820*	*0.06901*	*-7.94*	*<.0001*
education (Some Coll)		1	*0.16256*	*0.04463*	*3.64*	*0.0003*
marital status		1	*-0.23155*	*0.04049*	*-5.72*	*<.0001*
caregiver		1	*0.95584*	*0.06365*	*15.02*	*<.0001*
county (NCC)		1	*-0.24687*	*0.04236*	*-5.83*	*<.0001*
fulltime		1	*-0.38296*	*0.04606*	*-8.32*	*<.0001*
oncall		1	*0.38482*	*0.08381*	*4.59*	*<.0001*
current wage		1	*0.37828*	*0.01308*	*28.92*	*<.0001*
work experience		1	*-0.01246*	*0.00325*	*-3.83*	*0.0001*
counsel		1	*0.14007*	*0.04332*	*3.23*	*0.0012*
promotions		1	*-0.08912*	*0.04956*	*-1.80*	*0.0722*
# of jobs last 3 yrs		1	*-0.33965*	*0.02400*	*-14.15*	*<.0001*
unemployment lagged		1	*0.05962*	*0.03567*	*1.67*	*0.0947*
bed ratio		1	*0.29250*	*0.06925*	*4.22*	*<.0001*
retail wage		1	*-0.24068*	*0.02358*	*-10.21*	*<.0001*

Note: Bolded italicized variables are statistically significant.

The REG Procedure
Model: MODEL1
Dependent Variable: ltenure – Log of Tenure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	17	2828.76690	166.39805	113.69	<.0001
Error	4512	6603.82881	1.46361		
Corrected Total	4529	9432.59571			

Root MSE		1.20980	R-Square	0.2999
Dependent Mean		2.79041	Adj R-Sq	0.2973
Coeff Var		43.35561		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	3.88951	0.46992	8.28	<.0001
gender		*1*	*0.10762*	*0.04759*	*2.26*	*0.0238*
race		1	0.00683	0.05439	0.13	0.9001
education (college)		*1*	*-0.53902*	*0.06905*	*-7.81*	*<.0001*
education (some coll)		*1*	*0.17349*	*0.04460*	*3.89*	*0.0001*
marital status		*1*	*-0.23933*	*0.04048*	*-5.91*	*<.0001*
caregiver		*1*	*0.94848*	*0.06370*	*14.89*	*<.0001*
county (NCC)		*1*	*-0.24953*	*0.04243*	*-5.88*	*<.0001*
fulltime		*1*	*-0.39022*	*0.04607*	*-8.47*	*<.0001*
oncall		*1*	*0.39327*	*0.08390*	*4.69*	*<.0001*
current wage		*1*	*0.37406*	*0.01304*	*28.68*	*<.0001*
work experience		*1*	*-0.01264*	*0.00326*	*-3.88*	*0.0001*
counsel		*1*	*0.14118*	*0.04339*	*3.25*	*0.0011*
promotions		*1*	*-0.08667*	*0.04962*	*-1.75*	*0.0808*
# of jobs last 3 yrs		*1*	*-0.34355*	*0.02401*	*-14.31*	*<.0001*
unemployment lagged		*1*	*0.07805*	*0.03599*	*2.17*	*0.0302*
bed ratio		*1*	*0.29979*	*0.06933*	*4.32*	*<.0001*
service wage		*1*	*-0.41520*	*0.04322*	*-9.61*	*<.0001*

Note: Bolded italicized variables are statistically significant.

The LOGISTIC Procedure – RETENTION
Discharged vs. Still Employed
Model Information

Data Set	WORK.MULTI2
Response Variable	empcat
Number of Response Levels	2
Number of Observations	1656
Model	binary logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	empcat	Total Frequency
1	*discharged*	402
2	*still employed*	1254

Probability modeled is empcat='discharged'.

NOTE: 6101 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1837.620	1239.298
SC	1843.033	1336.717
-2 Log L	1835.620	1203.298

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	632.3221	17	<.0001
Score	493.3430	17	<.0001
Wald	328.3200	17	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	8.5772	1.2610	46.2633	<.0001
female	1	-0.2535	0.2234	1.2879	0.2564
minority	1	-0.3534	0.2775	1.6221	0.2028
college	*1*	*-0.4477*	*0.2676*	*2.7980*	*0.0944*
somecoll	*1*	*-1.5834*	*0.1781*	*79.0759*	*<.0001*
single	*1*	*2.0533*	*0.2484*	*68.3208*	*<.0001*
caregive	*1*	*-0.6896*	*0.3229*	*4.5606*	*0.0327*
ncc	*1*	*2.1160*	*0.2353*	*80.8606*	*<.0001*
full	1	0.2372	0.1919	1.5286	0.2163
curwage	1	0.0378	0.0851	0.1970	0.6572
YEARSALL	1	-0.00744	0.0162	0.2098	0.6469
counsel	*1*	*0.8586*	*0.1900*	*20.4312*	*<.0001*
promos	*1*	*-2.0171*	*0.3490*	*33.4019*	*<.0001*
JOBS	*1*	*0.4578*	*0.1124*	*16.5865*	*<.0001*
unemplag	1	0.0833	0.1434	0.3376	0.5612
bedratio	*1*	*-3.2927*	*0.4078*	*65.1808*	*<.0001*
retailwg	*1*	*-1.0864*	*0.1501*	*52.4060*	*<.0001*
tenure	*1*	*-0.0248*	*0.0102*	*5.9169*	*0.0150*

Note: Bolded italicized variables are statistically significant.

```
                   Odds Ratio Estimates

                    Point            95% Wald
       Effect     Estimate     Confidence Limits
       female       0.776     0.501       1.202
       minority     0.702     0.408       1.210
       college      0.639     0.378       1.080
       somecoll     0.205     0.145       0.291
       single       7.793     4.789      12.681
       caregive     0.502     0.266       0.945
       ncc          8.298     5.232      13.160
       full         1.268     0.870       1.847
       curwage      1.038     0.879       1.227
       YEARSALL     0.993     0.962       1.025
       counsel      2.360     1.626       3.424
       promos       0.133     0.067       0.264
       JOBS         1.581     1.268       1.970
       unemplag     1.087     0.821       1.440
       bedratio     0.037     0.017       0.083
       retailwg     0.337     0.251       0.453
       tenure       0.975     0.956       0.995


Association of Predicted Probabilities and Observed Responses

    Percent Concordant     87.9    Somers' D    0.758
    Percent Discordant     12.0    Gamma        0.759
    Percent Tied            0.1    Tau-a        0.279
    Pairs               504108    c            0.879
```

The LOGISTIC Procedure – RETENTION
Discharged vs. Still Employed
Model Information

Data Set	WORK.MULTI2
Response Variable	empcat
Number of Response Levels	2
Number of Observations	1656
Model	binary logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	empcat	Total Frequency
1	*discharged*	402
2	*still employed*	1254

Probability modeled is empcat='discharged'.

NOTE: 6101 observations were deleted due to missing values for the
response or explanatory variables.

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1837.620	1223.322
SC	1843.033	1320.740
-2 Log L	1835.620	1187.322

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	648.2989	17	<.0001
Score	499.4414	17	<.0001
Wald	328.3576	17	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	22.3734	2.5833	75.0118	<.0001
gender	1	-0.2201	0.2255	0.9525	0.3291
race	1	-0.3377	0.2801	1.4535	0.2280
education (C)	1	-0.4419	0.2690	2.6989	0.1004
education (SC)	1	*-1.5553*	*0.1791*	*75.4072*	*<.0001*
marital stat	1	*2.0860*	*0.2514*	*68.8469*	*<.0001*
caregiver	1	*-0.6219*	*0.3225*	*3.7191*	*0.0538*
county (NCC)	1	*2.1373*	*0.2383*	*80.4560*	*<.0001*
fulltime	1	0.2415	0.1934	1.5590	0.2118
current wage	1	0.0538	0.0848	0.4030	0.5255
work exper	1	-0.00743	0.0162	0.2094	0.6472
counsel	1	*0.8553*	*0.1915*	*19.9523*	*<.0001*
promotions	1	*-2.0845*	*0.3538*	*34.7185*	*<.0001*
# of jobs	1	*0.4433*	*0.1131*	*15.3534*	*<.0001*
unempl. lag	1	0.1919	0.1464	1.7173	0.1900
bed ratio	1	*-3.3217*	*0.4106*	*65.4482*	*<.0001*
service wage	1	*-2.1050*	*0.2645*	*63.3315*	*<.0001*
tenure	1	*-0.0210*	*0.0104*	*4.1092*	*0.0427*

Note: Bolded italicized variables are statistically significant.

```
                    Odds Ratio Estimates

                      Point           95% Wald
            Effect   Estimate      Confidence Limits
            female    0.802     0.516       1.248
            minority  0.713     0.412       1.235
            college   0.643     0.379       1.089
            somecoll  0.211     0.149       0.300
            single    8.053     4.920      13.181
            caregive  0.537     0.285       1.010
            ncc       8.477     5.314      13.522
            full      1.273     0.871       1.860
            curwage   1.055     0.894       1.246
            YEARSALL  0.993     0.961       1.025
            counsel   2.352     1.616       3.423
            promos    0.124     0.062       0.249
            JOBS      1.558     1.248       1.945
            unemplag  1.212     0.909       1.614
            bedratio  0.036     0.016       0.081
            servwg    0.122     0.073       0.205
            tenure    0.979     0.959       0.999


   Association of Predicted Probabilities and Observed Responses

        Percent Concordant    88.2    Somers' D    0.766
        Percent Discordant    11.7    Gamma        0.767
        Percent Tied           0.1    Tau-a        0.282
        Pairs               504108    c            0.883
```

The LOGISTIC Procedure – RETENTION
Resigned vs. discharged
Model Information

Data Set	WORK.MULTI2
Response Variable	empcat
Number of Response Levels	2
Number of Observations	1464
Model	binary logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	empcat	Total Frequency
1	*resigned*	1062
2	*discharged*	402

Probability modeled is empcat='resigned'.

NOTE: 5062 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1722.994	1335.697
SC	1728.283	1436.187
-2 Log L	1720.994	1297.697

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	423.2964	18	<.0001
Score	355.2401	18	<.0001
Wald	239.5230	18	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	5.6783	1.1693	23.5801	<.0001
gender	1	*0.8929*	*0.1888*	*22.3761*	*<.0001*
race	1	*-1.0047*	*0.2172*	*21.3998*	*<.0001*
education (C)	1	*0.8043*	*0.2551*	*9.9421*	*0.0016*
education (SC)	1	*0.5645*	*0.1701*	*11.0192*	*0.0009*
marital stat	1	*-2.4347*	*0.2267*	*115.3413*	*<.0001*
caregiver	1	-0.4333	0.2670	2.6340	0.1046
county (NCC)	1	-0.2298	0.1884	1.4888	0.2224
fulltime	1	*-0.8160*	*0.1949*	*17.5223*	*<.0001*
oncall	1	14.9458	393.0	0.0014	0.9697
current wage	1	*-0.5187*	*0.0890*	*33.9769*	*<.0001*
work exper	1	*0.0335*	*0.0175*	*3.6578*	*0.0558*
counsel	1	*-0.9202*	*0.1625*	*32.0808*	*<.0001*
promotions	1	0.0228	0.3014	0.0057	0.9396
# of jobs	1	*0.5321*	*0.0993*	*28.7279*	*<.0001*
unempl. lag	1	*-0.2371*	*0.1418*	*2.7939*	*0.0946*
bed ratio	1	*2.8338*	*0.4169*	*46.2133*	*<.0001*
retail wage	1	0.0681	0.1444	0.2222	0.6374
tenure	1	-0.00583	0.0110	0.2804	0.5964

Note: Bolded italicized variables are statistically significant.

```
                 Odds Ratio Estimates

                      Point        95% Wald
        Effect      Estimate    Confidence Limits
        female         2.442      1.687      3.535
        minority       0.366      0.239      0.560
        college        2.235      1.356      3.685
        somecoll       1.759      1.260      2.454
        single         0.088      0.056      0.137
        caregive       0.648      0.384      1.094
        ncc            0.795      0.549      1.150
        full           0.442      0.302      0.648
        oncall      >999.999     <0.001   >999.999
        curwage        0.595      0.500      0.709
        YEARSALL       1.034      0.999      1.070
        counsel        0.398      0.290      0.548
        promos         1.023      0.567      1.847
        JOBS           1.702      1.401      2.068
        unemplag       0.789      0.597      1.042
        bedratio      17.010      7.514     38.506
        retailwg       1.070      0.807      1.421
        tenure         0.994      0.973      1.016


   Association of Predicted Probabilities and Observed Responses

     Percent Concordant     80.9    Somers' D    0.620
     Percent Discordant     18.9    Gamma        0.621
     Percent Tied            0.2    Tau-a        0.247
     Pairs               426924    c            0.810
```

The LOGISTIC Procedure – RETENTION
Resigned vs. discharged
Model Information

Data Set	WORK.MULTI2
Response Variable	empcat
Number of Response Levels	2
Number of Observations	1464
Model	binary logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	empcat	Total Frequency
1	*resigned*	1062
2	*discharged*	402

Probability modeled is empcat='resigned'.

NOTE: 5062 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1722.994	1335.393
SC	1728.283	1435.883
-2 Log L	1720.994	1297.393

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	423.6002	18	<.0001
Score	355.2134	18	<.0001
Wald	239.3333	18	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	4.2526	2.5921	2.6915	0.1009
gender	1	0.8934	0.1889	22.3745	<.0001
race	1	-1.0063	0.2172	21.4613	<.0001
education (C)	1	0.8076	0.2548	10.0445	0.0015
education (SC)	1	0.5692	0.1693	11.2997	0.0008
marital stat	1	-2.4463	0.2269	116.1996	<.0001
caregiver	1	-0.4467	0.2659	2.8222	0.0930
county (NCC)	1	-0.2244	0.1885	1.4180	0.2337
fulltime	1	-0.8150	0.1949	17.4755	<.0001
oncall	1	14.9668	392.9	0.0015	0.9696
current wage	1	-0.5293	0.0882	36.0081	<.0001
work exper	1	0.0327	0.0175	3.4897	0.0618
counsel	1	-0.9270	0.1622	32.6455	<.0001
promotions	1	0.0351	0.3030	0.0134	0.9078
# of jobs	1	0.5307	0.0994	28.5105	<.0001
unempl lag	1	-0.2459	0.1427	2.9684	0.0849
bed ratio	1	2.8455	0.4172	46.5223	<.0001
service wage	1	0.1906	0.2633	0.5238	0.4692
tenure	1	-0.00691	0.0110	0.3946	0.5299

Note: Bolded italicized variables are statistically significant.

```
                    Odds Ratio Estimates

                    Point          95% Wald
     Effect       Estimate     Confidence Limits
     female         2.443       1.687       3.538
     minority       0.366       0.239       0.560
     college        2.242       1.361       3.695
     somecoll       1.767       1.268       2.462
     single         0.087       0.056       0.135
     caregive       0.640       0.380       1.077
     ncc            0.799       0.552       1.156
     full           0.443       0.302       0.649
     oncall       >999.999     <0.001     >999.999
     curwage        0.589       0.496       0.700
     YEARSALL       1.033       0.998       1.069
     counsel        0.396       0.288       0.544
     promos         1.036       0.572       1.876
     JOBS           1.700       1.399       2.066
     unemplag       0.782       0.591       1.034
     bedratio      17.210       7.598      38.984
     servwg         1.210       0.722       2.027
     tenure         0.993       0.972       1.015


Association of Predicted Probabilities and Observed Responses

   Percent Concordant      80.9    Somers' D    0.620
   Percent Discordant      18.9    Gamma        0.621
   Percent Tied             0.2    Tau-a        0.247
   Pairs                 426924    c            0.810
```

The LOGISTIC Procedure – RETENTION
Resigned vs. still employed
Model Information

Data Set	WORK.MULTI2
Response Variable	empcat
Number of Response Levels	2
Number of Observations	2316
Model	binary logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	empcat	Total Frequency
1	*resigned*	1062
2	*still emp*	1254

Probability modeled is empcat='resigned'.

NOTE: 8613 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	3196.722	2296.487
SC	3202.470	2405.692
-2 Log L	3194.722	2258.487

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	936.2350	18	<.0001
Score	786.6189	18	<.0001
Wald	563.4494	18	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	14.6454	0.8908	270.3145	<.0001
gender	*1*	*0.5679*	*0.1473*	*14.8578*	*0.0001*
race	*1*	*-0.5987*	*0.1612*	*13.7864*	*0.0002*
education (C)	1	-0.0264	0.2022	0.0170	0.8961
education (SC)	*1*	*-1.0489*	*0.1348*	*60.5379*	*<.0001*
marital stat	1	-0.1587	0.1179	1.8114	0.1783
caregiver	*1*	*-0.9734*	*0.2194*	*19.6866*	*<.0001*
county (NCC)	*1*	*1.2158*	*0.1436*	*71.7182*	*<.0001*
fulltime	*1*	*-1.1237*	*0.1490*	*56.8490*	*<.0001*
oncall	*1*	*-2.8657*	*0.2957*	*93.9516*	*<.0001*
current wage	*1*	*-0.1694*	*0.0596*	*8.0741*	*0.0045*
work exper	*1*	*-0.0191*	*0.00931*	*4.1959*	*0.0405*
counsel	*1*	*0.5375*	*0.1478*	*13.2221*	*0.0003*
promotions	*1*	*-0.4708*	*0.1495*	*9.9138*	*0.0016*
# of jobs	*1*	*0.8265*	*0.0780*	*112.3323*	*<.0001*
unemp lag	1	-0.00260	0.1021	0.0006	0.9797
bed ratio	*1*	*-0.8749*	*0.2516*	*12.0898*	*0.0005*
retail wage	*1*	*-1.3795*	*0.0990*	*194.2902*	*<.0001*
tenure	1	0.00368	0.00615	0.3580	0.5496

Note: Bolded italicized variables are statistically significant.

```
                  Odds Ratio Estimates

                   Point           95% Wald
        Effect    Estimate     Confidence Limits
        female     1.764      1.322       2.355
        minority   0.550      0.401       0.754
        college    0.974      0.655       1.448
        somecoll   0.350      0.269       0.456
        single     0.853      0.677       1.075
        caregive   0.378      0.246       0.581
        ncc        3.373      2.546       4.469
        full       0.325      0.243       0.435
        oncall     0.057      0.032       0.102
        curwage    0.844      0.751       0.949
        YEARSALL   0.981      0.963       0.999
        counsel    1.712      1.281       2.287
        promos     0.624      0.466       0.837
        JOBS       2.285      1.961       2.663
        unemplag   0.997      0.817       1.218
        bedratio   0.417      0.255       0.683
        retailwg   0.252      0.207       0.306
        tenure     1.004      0.992       1.016


  Association of Predicted Probabilities and Observed Responses

      Percent Concordant      84.2    Somers' D    0.686
      Percent Discordant      15.6    Gamma        0.687
      Percent Tied             0.1    Tau-a        0.341
      Pairs                1331748    c            0.843
```

The LOGISTIC Procedure – RETENTION
Resigned vs. Stil Employed
Model Information

Data Set	WORK.MULTI2
Response Variable	empcat
Number of Response Levels	2
Number of Observations	2316
Model	binary logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	empcat	Total Frequency
1	*resigned*	1062
2	***still emp***	1254

Probability modeled is empcat='resigned'.

NOTE: 8613 observations were deleted due to missing values for the response or explanatory variables.

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	3196.722	2279.780
SC	3202.470	2388.985
-2 Log L	3194.722	2241.780

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	952.9422	18	<.0001
Score	794.0560	18	<.0001
Wald	563.0554	18	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	30.2651	1.7763	290.3138	<.0001
gender	1	0.5546	0.1475	14.1454	0.0002
race	1	-0.6083	0.1626	13.9882	0.0002
education (C)	1	0.0286	0.2036	0.0197	0.8885
education (S)	1	-1.0207	0.1349	57.2608	<.0001
marital stat	1	-0.1635	0.1180	1.9208	0.1658
caregiver	1	-0.9715	0.2190	19.6757	<.0001
county (NCC)	1	1.2139	0.1441	71.0015	<.0001
fulltime	1	-1.1376	0.1499	57.6210	<.0001
oncall	1	-2.8030	0.2944	90.6498	<.0001
current wage	1	-0.1743	0.0595	8.5900	0.0034
work exper	1	-0.0197	0.00937	4.3996	0.0359
counsel	1	0.5387	0.1489	13.0899	0.0003
promotions	1	-0.4901	0.1509	10.5514	0.0012
# of jobs	1	0.8178	0.0784	108.7094	<.0001
unempl lag	1	0.1094	0.1040	1.1076	0.2926
bed ratio	1	-0.8778	0.2533	12.0088	0.0005
service wage	1	-2.4626	0.1722	204.5050	<.0001
tenure	1	0.00292	0.00619	0.2230	0.6368

Note: Bolded italicized variables are statistically significant.

```
                    Odds Ratio Estimates

                    Point        95% Wald
      Effect        Estimate   Confidence Limits
       female        1.741     1.304     2.325
       minority      0.544     0.396     0.749
       college       1.029     0.690     1.534
       somecoll      0.360     0.277     0.469
       single        0.849     0.674     1.070
       caregive      0.379     0.246     0.581
       ncc           3.367     2.538     4.465
       full          0.321     0.239     0.430
       oncall        0.061     0.034     0.108
       curwage       0.840     0.748     0.944
       YEARSALL      0.981     0.963     0.999
       counsel       1.714     1.280     2.295
       promos        0.613     0.456     0.823
       JOBS          2.265     1.943     2.642
       unemplag      1.116     0.910     1.368
       bedratio      0.416     0.253     0.683
       servwg        0.085     0.061     0.119
       tenure        1.003     0.991     1.015


  Association of Predicted Probabilities and Observed Responses

     Percent Concordant     84.5    Somers' D    0.691
     Percent Discordant     15.4    Gamma        0.692
     Percent Tied            0.1    Tau-a        0.343
     Pairs               1331748    c            0.845
```