

Effectiveness of Rehabilitation Services Provision Following the Implementation of Section 21 of the Rehabilitation Act

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Summary

The Rocky Mountain Technical Assistance and Consulting Center (RMTACC) conducted a research study designed to measure the effectiveness of rehabilitation services provision and outcomes for individuals with disabilities following the implementation of Section 21 of the Rehabilitation Act, as amended. This project was conducted through a supplement to its current capacity building grant. RMTACC is funded under 315D05001 to provide a broad range of capacity building services to minority entities and Indian tribes to enhance their capacity to develop and increase the number of rehabilitation professionals available to work in the public rehabilitation system.

Background

The focus of section 21 of the Rehabilitation Act is to improve the provision of vocational rehabilitation (VR) services to traditionally underserved populations. The 1998 amendments define traditionally underserved populations as racial and ethnic minorities including; African Americans, American Indians, Asian-Americans and Hispanic/Latino/a. The amendments state that with respect to the programs authorized in titles II through VII, the Congress found: a rapidly changing racial profile of United States; higher disability rates for ethnic and racial minorities; minority under-representation in the VR profession; and inequitable treatment. Patterns of inequitable treatment of minorities have been documented in all major junctures of the vocational rehabilitation process.

Since the inclusion of Section 21, Rehabilitation Programs funded under the Act are required to ensure that their services are provided in an inclusive and equitable manner to all individuals with disabilities.

Study Objectives

This project analyzed the effectiveness of rehabilitation service provision and rehabilitation outcomes to individuals with disabilities from ethnic minority populations after the 1998 amendments to section 21 took effect. The hypothesis was that service provision to minorities and Whites became more equitable after Section 21 provisions went into effect.

Specifically the Study tested the hypothesis that after the provisions of 1998 amendments to Section 21 of the Act took effect there was no difference in:

- Waiting and intervention access periods for White and for ethnic minority consumers
- Per capita expenditures on services rendered to White and to ethnic minority consumers
- Quality of services rendered to White and to ethnic minority consumers
- Rehabilitation services intervention outcomes of White and of ethnic minority consumers
- Closure types for White and of ethnic minority consumers
- Reasons for closures of White and of ethnic minority consumers.

Methods

The project defined effectiveness of service provision and outcomes in terms of services provided, timeliness, amount of expenditures, and quality of employment outcomes of ethnic minority populations. Effectiveness was assessed through analysis of case management data compiled by the Rehabilitation Services Administration. The data are commonly known as RSA-

911 data. The study analyzed close to 1.2 million cases closed by VR in 1997 and 2007. It compared access, case management practices, service provision, and outcomes of white consumers to those of minority consumers in 1997 to 2007. Ideally, the hypothesis should have been tested by a comparison of VR service provision and outcomes before and after Section 21 provisions went into effect. However data limitations made it impossible to conduct such a comparison. The study was able to compare outcomes before and after section 21 amendments of 1998. Thus the study compared VR access and intervention outcomes before (1997) and after (2007) the 1998 amendments went into effect.

The study used statistical test (t-tests) to determine significant differences in access and outcomes of white and minority consumers. The study also used multivariate analysis to test if minority status was a relevant and significant predictor of VR outcomes.

Results

The study found the following:

- Most of the access and outcome differences that existed in 1997 were also found in 2007;
- Minority status was a statistically significant predictor of VR access and outcomes;
- Three reasons account for the largest proportion of closures: “unable to locate”, “refused services” and “failure to cooperate”. This is especially true for minority consumers;
- A large proportion of minority consumers were closed after being determined to be eligible for VR services but before a signed Individualized Program of Employment (IPE);
- American Indians and African Americans consumers had worse access and outcomes both before and after the provision of the 1998 amendments to section 21 of the Act. They experienced significantly shorter service access periods, less money was spent on them per capita and they had lower successful closure rates than white consumers; they experienced proportionately more applicant closures and fewer “rehabilitated” closures; they were more dependent on needs-based public support both before and after accessing VR services;
- By all measures used, Asian Americans had better access and outcomes than white consumers both before and after the provisions of section 21 of the act took effect. They experienced longer services access periods, more money was spent on them per capita, and they had higher rates of successful closures than white consumers; after accessing VR services, they had higher educational levels and greater dependence on employer-based health insurance;

The findings for Hawaii/Pacific Islanders and for non-white Hispanics were mixed:

- Hawaiian/Pacific Islander consumers had access almost at par with Whites. However, in 2007 per capita expenditures on them were significantly lower than expenditures on white consumers. After they accessed VR services, some of their outcomes were statistically the same as those of Whites such as their earnings; they have lower educational levels, lower rates of employment-based health insurance than white consumers; their closure types were statistically similar to those of Whites;
- Non-white Hispanics fared almost as well as Whites in some aspects but are worse off in others: their services access periods were as long as those for Whites but significantly less money was spent on them per capita; proportionately more of them were closed as applicants and fewer “rehabilitated”; the earnings gap with Whites grew after accessing

services; they had lower educational levels and were more dependent on needs-based public support than their White counterparts.

Multivariate analysis results indicate that minority status has a negative and statistically significant effect on successful closures. Analysis of both 1997 and 2007 data indicate that even after controlling for other factors that affect VR outcomes (including individual demographic characteristics, socioeconomic status, types of services rendered, as well as cost and length of services) minority status remains a negative and significant predictor of the likelihood of successful closures.

Changes between 1997 and 2007

Although hypothesis 1 is rejected, it is important to note changes in services access gaps between 1997 and 2007. The data indicate a closing gap in periods of waiting from application to eligibility determination. Although the access gap between whites and African Americans and American Indians is statistically significant, it was smaller in 2007 than it was in 1997. In both 1997 and 2007, the gap in access periods between Whites and non-white Hispanics is statistically insignificant. In both 1997 and 2007, Asians and Hawaiian/Pacific Islanders accessed services for longer periods than Whites. That gap more than doubles in 2007. Thus the services access gap is closing except for Asians and Pacific Islanders for whom the gap is widening to their advantage.

Hypothesis 2 is rejected but there are notable changes between 1997 and 2007. VR spent more per capita on whites than on African Americans, American Indians and on non-white Hispanics. The expenditure gap was greater in 2007 than it was in 1997 further disadvantaging African Americans and American Indians. The gap for non-white Hispanics decreased slightly from \$466.27 in 1997 to \$ 396.34 in 2007. In 1997 VR spent \$ 81.56 per capita more for Asians than for whites and that gap grew to \$516.26 in 2007.

Hypothesis 3 is also rejected with notable changes between 1997 and 2007. The services rendered gap between Whites and African Americans seems to have widened in 2007. In 1997 there were no significant differences in access to miscellaneous training and counseling but in 2007 the differences were statistically significant. African Americans received more miscellaneous training in 2007. Also notable is the fact that in 1997 African Americans received proportionately more adjustment and on-the-job training but in 2007 they received less of those services. In 1997, African Americans accessed more job finding, and placement and more maintenance services, but in 2007 they received less of these services.

Similarly the services access gaps for American Indians seem to have widened in 2007. In 1997 there were no differences in access to restoration, college and on-the-job training, job-finding and access to assistive technology devices. However, in 2007 the difference in access to these services was statistically significant. These data also indicate a closure in some service access gaps between Whites and American Indians such as access to vocational and miscellaneous training, access to assistive technology services and to other personal services.

There are some changes in differences in services rendered to White and Asian/ Hawaiian/ Pacific Islanders. In 1997 there were no differences in access to vocational and on-the-job training but 2007 data indicate significant differences with Asians/Pacific Islanders receiving proportionately **more** of these services than Whites. On the other hand some gaps closed in 2007. These include access to personal service, rehabilitation technology and to other services.

Compared to 1997 where there were no significant differences between Whites and non-white Hispanics in access to vocational and miscellaneous training, in 2007 Hispanics received proportionately more of these services than did Whites. The opposite is true for access to maintenance and other services. Similar to 1997, there were no differences in access to on-the-

job training for White consumers and for non-white Hispanics. In 2007 non-white Hispanic consumers received proportionately less rehab engineering, maintenance and other services the opposite was the case in 1997.

Hypothesis 4 is rejected with some notable changes between 1997 and 2007. The earnings gaps at closure in 2007 were wider than in 1997 for African Americans, American Indians and for non-white Hispanics. The earnings gap at closure between Asians and Whites was fairly stable between 1997 (\$16.44 per week) and 2007 (\$17.04 per week). The earnings gap between whites and Pacific Islanders was small and insignificant in 2007.

Hypothesis 5 is rejected but there are notable changes between 1997 and 2007. In 2007 smaller proportions of all consumers were closed out as applicants, or after an extended evaluation. Also notable is the fact that in 2007 smaller proportions were closed rehabilitated with employment outcomes than was the case in 1997 for all consumer groups studied. The only exception is Asians whom experienced an improvement from 35% to 36% closed with employment outcomes.

When tested with 1997 hypothesis 6 was rejected only for non-white Hispanics but for 2007 it was rejected for African Americans, American Indians and non-white Hispanics, suggesting that there were differences in closure reasons for whites and for these minority groups. However, there were no differences in closure reasons for whites and for Asians or Hawaiian/Pacific Islanders. Other notable changes are that smaller proportions of consumers were closed for the reasons "unable to locate or contact" "refused services" and "failure to cooperate" in 2007 than was the case in 1997. This change might suggest better communication between consumers and VR in 2007 than was the case in 1997.

Conclusions and Recommendations

The study finds statistically significant differences between White and minority consumers' access and outcomes after the 1998 provisions of section 21 of the Act. Therefore, the study rejects all the hypotheses.

The study recommends that follow-up studies be conducted to obtain more specific data and information that will guide VR toward effective approaches for improving access and outcomes for minority consumers. Such studies should identify where and by what means quality outcomes are being achieved. The studies would find answers to the following questions:

- What best practices are being employed to achieve quality outcomes?
- What agencies have the highest number of quality outcomes?
- Do VR agencies have policies and procedures that lead to quality outcomes for minority group members?
- Are there differences between and within States that lead to better outcomes?
- Are there particular characteristics of consumers who achieve better outcomes?
- Are there particular characteristics of counselors who achieve better outcomes?
- What interventions can be employed to improve the quality of outcomes for minority consumers?
- Have the findings of the IRI on diversity been implemented by VR agencies?

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Introduction and Background – 1998 Amendments to Section 21 of the Act

The focus of section 21 of the Rehabilitation Act is vocational rehabilitation (VR) services provision to traditionally underserved populations. The 1998 amendments define traditionally underserved populations as racial and ethnic minorities including; African Americans, American Indians, Asian-Americans and Latino/a. The amendments state that with respect to the programs authorized in titles II through VII, the Congress found: a rapidly changing racial profile of United States; higher disability rates for ethnic and racial minorities; minority under-representation in the VR profession; and inequitable treatment. Furthermore, patterns of inequitable treatment of minorities have been documented in all major junctures of the vocational rehabilitation process. The 1998 amendments also state:

“...compared to white Americans, a larger percentage of African-American applicants to the vocational rehabilitation system is denied acceptance. Of applicants accepted for service, a larger percentage of African-American cases is closed without being rehabilitated. Minorities are provided less training than their white counterparts. Consistently, less money is spent on minorities than on their white counterparts...”

To remedy this situation, the 1998 amendments recommended:

- Recruitment efforts that focus on *“bringing larger numbers of minorities into the profession in order to provide appropriate practitioner knowledge, role models, and sufficient manpower to address the clearly changing demography of vocational rehabilitation”*.
- Outreach to Minorities using 1% of funds appropriated for the fiscal year for programs authorized under titles II, III, VI, and VII

- Activities to include making awards to minority entities and Indian tribes to: A.) carry out activities under the programs authorized under titles II, III, VI, and VII; B.) conduct research, training, technical assistance, or a related activity, to improve services provided under this Act, especially services provided to individuals from minority backgrounds; and C.) provide outreach and technical assistance to minority entities and Indian tribes to promote their participation in activities funded under this Act, including assistance to enhance their capacity to carry out such activities

Furthermore, in funding activities, the VR Commissioner and the Director of National Institute on Disability and Rehabilitation Research are required to ensure that those funded address the needs of minority individuals with disabilities. They are also required to report to Congress annually on the activities funded.

The purpose of this study is to assess VR effectiveness in meeting the provisions of these amendments. The focus of this study is to assess changes in the original findings that prompted Congress to focus its attention on VR service provision to individuals from traditionally underserved populations. Because the amendments are based on the finding that: *compared to white Americans minorities have a higher likelihood of being denied acceptance by VR; once accepted, their cases have a higher probability of being closed without being rehabilitated; minorities are provided less training than their white counterparts and that consistently, less money is spent on minorities than on their white counterparts*, this study focused on these issues in its analysis.

Specific Study Objectives

Specifically the Study tested the hypothesis that after the provisions of 1998 amendments to Section 21 of the Act took effect there were no differences between White and minority consumers in:

1. Waiting and intervention access periods

2. Per capita expenditures on services rendered
3. Quality of services rendered
4. Rehabilitation services intervention outcomes
5. Closure types
6. Reasons for case closures.

In the first hypothesis, waiting and length of service provision by VR are used as indicators of both access and quality of services received by consumers. Per capita expenditures on services may also be indicative of quality of services rendered. Differential expenditures was one of the findings that prompted the amendments to section 21 of the Act. Assessment of the closure types and reasons for closure provide a comparison of VR acceptance rates, quality of training and VR service provision outcomes. These hypotheses, therefore, focus on the heart of the findings that prompted the 1998 amendments to Section 21 of the Act.

Study Methods

Data Source

The data source for this study is Case Service Reports data compiled by VR through the course of serving consumers and at the end of service provision. The records from each state are used by U.S. Department of Education's Rehabilitation Services Administration (RSA) to compile the Case Service Reports data on all consumers whose cases are closed each year. These data are commonly known as RSA-911 data. Because these are case management data compiled by VR in the process of serving consumers, they are expected to provide the most accurate information available on access and outcomes of VR services for people with disabilities in the US. These data include demographic information such as gender, race/ethnicity; and services access data such as, dates of application, eligibility determination, Individualized Program of Employment (IPE). The data also include socioeconomic data such as, educational levels attained, employment status, earnings, education, and dependency on

public support. Services provision data reported include: types of services rendered, the length and cost of purchased services; and reasons and types of closure. This study used the RSA-911 data from cases closed in 1997 and in 2007.

This study used most of the variables in their original form without manipulation. A few variables were extrapolated from the data, such as: the application and closure dates were used to extrapolate the length of service; the application, IPE and eligibility determination dates were used to extrapolate consumer waiting and service periods. Other data such as, the types of services rendered, level of education at application and closure, employment status, work and earnings at application and closure did not need manipulation.

Analysis

The study analyzed the differences between White and minority consumers' access to and outcomes of VR services. The hypotheses posed by this study are equivalent to the null hypothesis that the difference between VR access and outcomes for White and minority consumers is equal to zero:

$$H_0: \quad \mu_1 - \mu_2 = 0; \quad \text{that is mean}_{\text{White}} - \text{mean}_{\text{minority}} = 0 \quad (1)$$

The alternative hypothesis

$$H_a: \quad \mu_1 - \mu_2 \neq 0; \quad \text{that is mean}_{\text{White}} - \text{mean}_{\text{minority}} \neq 0 \quad (2)$$

These hypotheses were tested using a t-test of independent samples.

The t-test uses the statistic defined as:

$$t = \frac{u_1 - u_2}{SE(u_1 - u_2)} \quad (3)$$

Where the numerator represents the difference in the means and the denominator is the standard error of the difference and it measures variability or dispersion in the two samples of the variable being analyzed. The standard error of the difference is defined as

$$SE(u_1 - u_2) = \sqrt{\frac{\text{var}_1}{n_1} + \frac{\text{var}_2}{n_2}} \quad (4)$$

Where var_1 and var_2 are variances in samples one and two respectively and n_1, n_2 are the sizes (number of observations) of the two samples. So that the t-statistic used in these tests is:

$$t = \frac{u_1 - u_2}{\sqrt{\frac{\text{var}_1}{n_1} + \frac{\text{var}_2}{n_2}}} \quad (5)$$

The t test was used to determine statistical significance of the mean difference between White and racial and ethnic minority consumers' access to and outcomes of VR services (that is to test if the mean difference between White and minorities is zero). The selected level of significance was 1% ($p < 0.01$). These tests were done using the SPSS statistical analysis package.

The study analyzed data on all racial minority groups including, African Americans, American Indians/Alaska Natives, Asians, Hawaiians/Pacific Islanders and people of non-white Hispanics/Latino ethnicity. The racial minority groups' access and outcomes were compared to White access and outcomes. In order to gather more detailed information about access and outcomes of VR services of racial and ethnic minorities, the study did not group together all minorities but analyzed each group separately. The study compared each ethnic/racial minority group to Whites. The study analyzed differences between Hispanic and non-white Hispanic consumers but found that those differences appeared to be similar to the differences between White and minority consumers. A study of the Hispanic sample revealed that most of them were white (see table 1b below) and that their access and outcomes were similar to those of white consumers. Consequently, the study isolated the non-white Hispanics and compared their access and outcomes to those of white consumers.

To gather more information about minority/majority consumer outcome differences, the study conducted a multivariate analysis using logistic regression. The study estimated the probability or likelihood of attaining successful closure – rehabilitated. This analysis is necessary

because through it, the study was able to control for other factors such as individual demographic characteristics, service access factors and others while analyzing the affect of minority status on outcomes.

Study Sample

The study analyzed close to 1.2 million cases of consumers that accessed or attempted to access VR services. The study sample included 589,665 cases closed by VR in 1997 and 600,188 cases closed by VR in 2007. The sample characteristics are summarized in tables 1a and 1b and by the charts below. Between 72% and 75% of the cases are of white consumers, 21%-24% are African Americans and the rest are other racial minorities. About 45% of the consumers in this sample are female. The 1997 data combined Asian and Hawaiian/Pacific Islanders as one group. In 2007 these consumers' data were reported separately in two groups. Also noteworthy is the fact that Hispanic consumers comprise 8.8% and 8.9% of the consumers in 1997 and 2007 respectively. However most of these consumers are also white. The non-white Hispanic consumers comprise only 0.8% of the sample in both 1997 and 2007 data (see table 1a). Because of the greater majority of Hispanic consumers were also white, a comparison of Hispanic and white consumers did not yield any information. It was necessary to isolate the non-white Hispanic consumers and to compare them to white consumers in order to gather useful information (see table 1b).

Table 1a: Study Sample by Race

Race/Ethnicity	1997		2007	
	Number	Percent	Number	Percent
White	446445	75.7	433501	72.2
African American	126108	21.4	140610	23.4
American Indian	5767	1.0	10301	1.7
Asian	6637	1.1	7270	1.2
Hawaiian/Pacific Islander			2750	.5
Non-White Hispanic/Latino	4682	.8	4811	.8
Total	589639	100.0	599243	99.8
Missing*	26	.0	945	.2
Grand Total	589665	100.0	600188	100.0

* Race/Ethnicity not recorded

Table 1b: Study Sample by Hispanic Ethnicity

Ethnicity	1997		2007	
	Number	Percent	Number	Percent
Non-Hispanic	538033	91.2	540749	90.1
All Hispanics	51631	8.8	53674	8.9
Non-White Hispanics	4689	.8	4811	.8
Total	589664	100.0	599234	99.8
Missing*	1	.0	954	.2
Total	589665	100.0	600188	100.0

* Race/Ethnicity not recorded

Figure 1: Study Sample by Race & Ethnicity

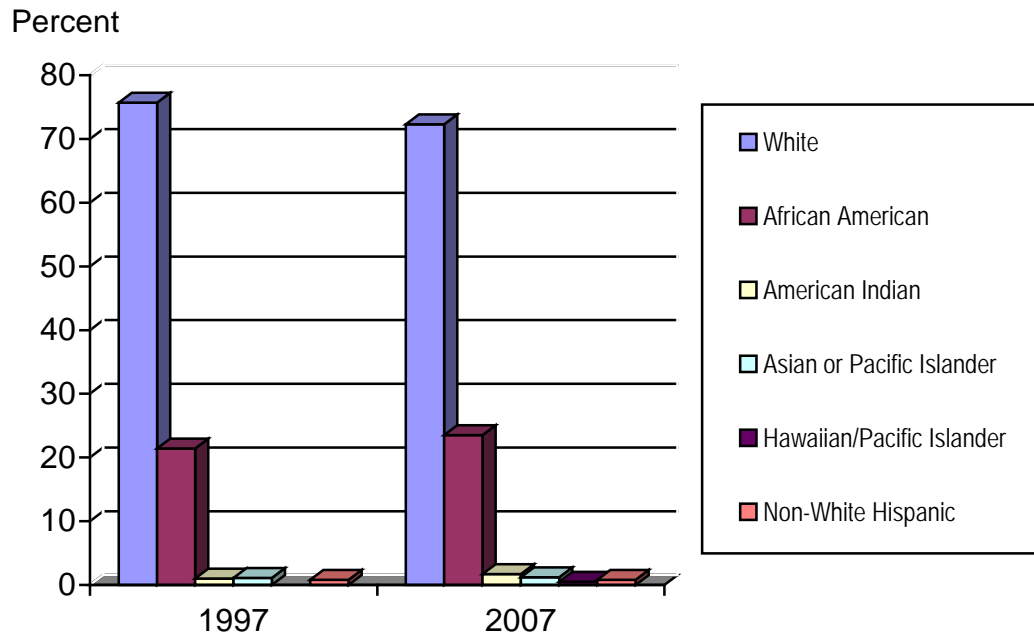
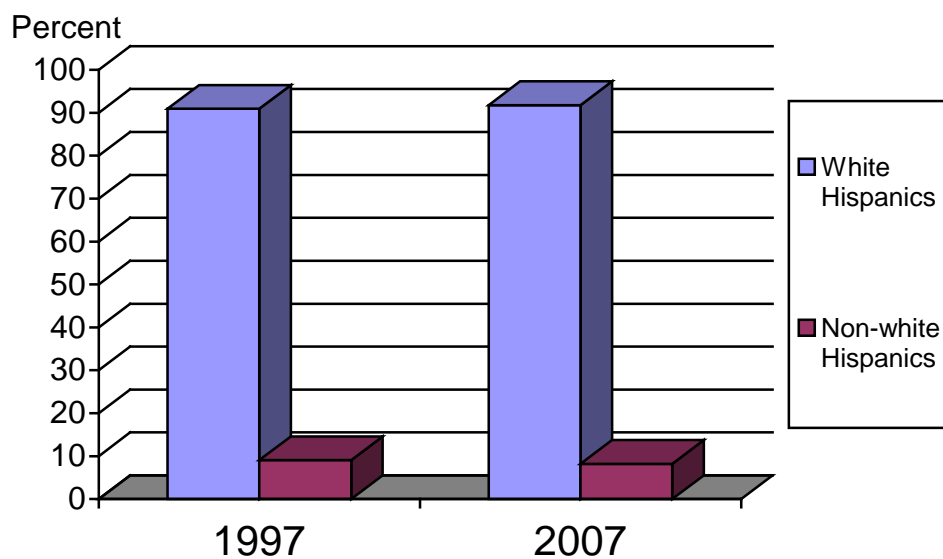
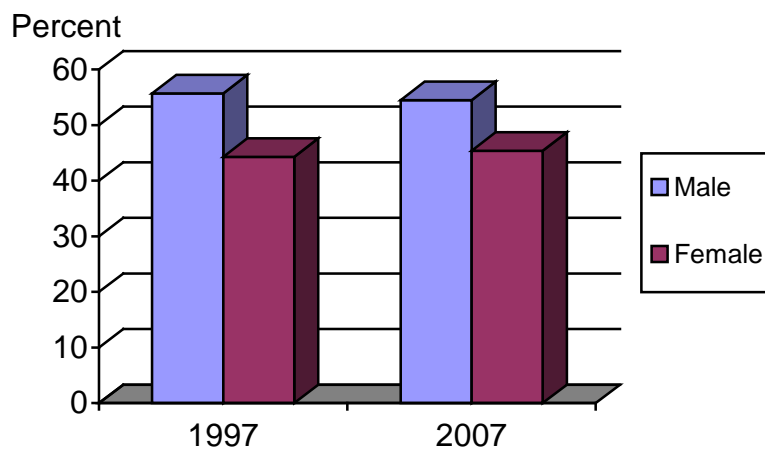


Figure 2: Hispanics by Race**Figure 3: Study Sample by Gender**

As indicated in the figures 4 - 6 below, most of the cases in this sample did not have previous closures and a large proportion of them accessed VR through self-referral and other individual sources.

Figure 4: Previous Closures 1997

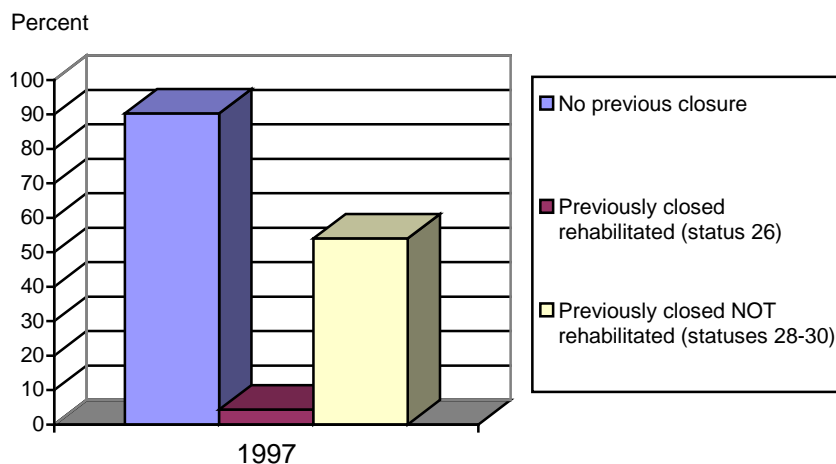


Figure 5: Previous Closures 2007

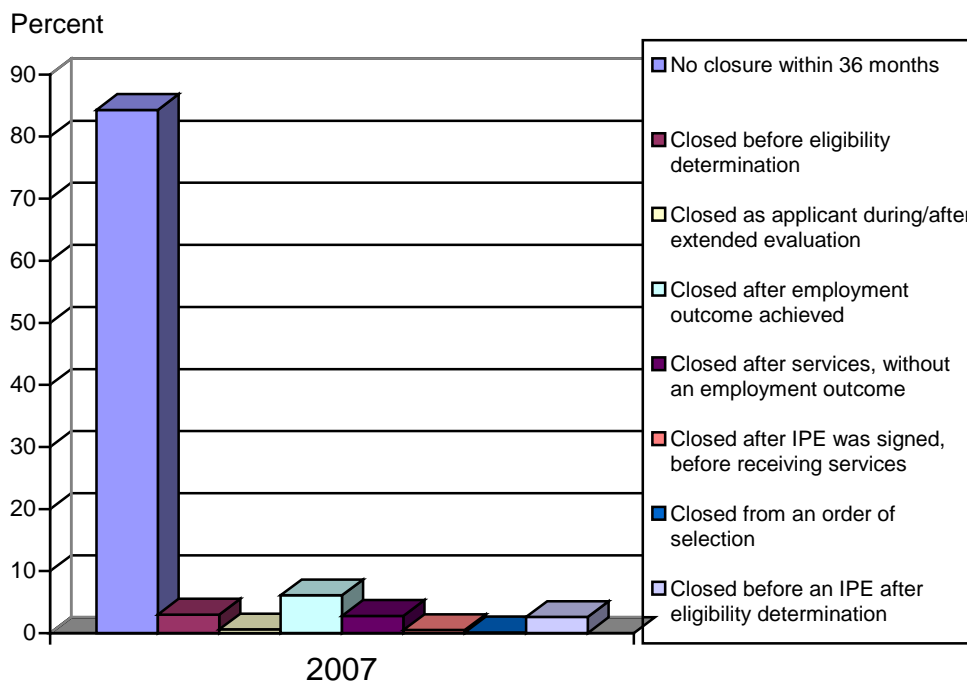
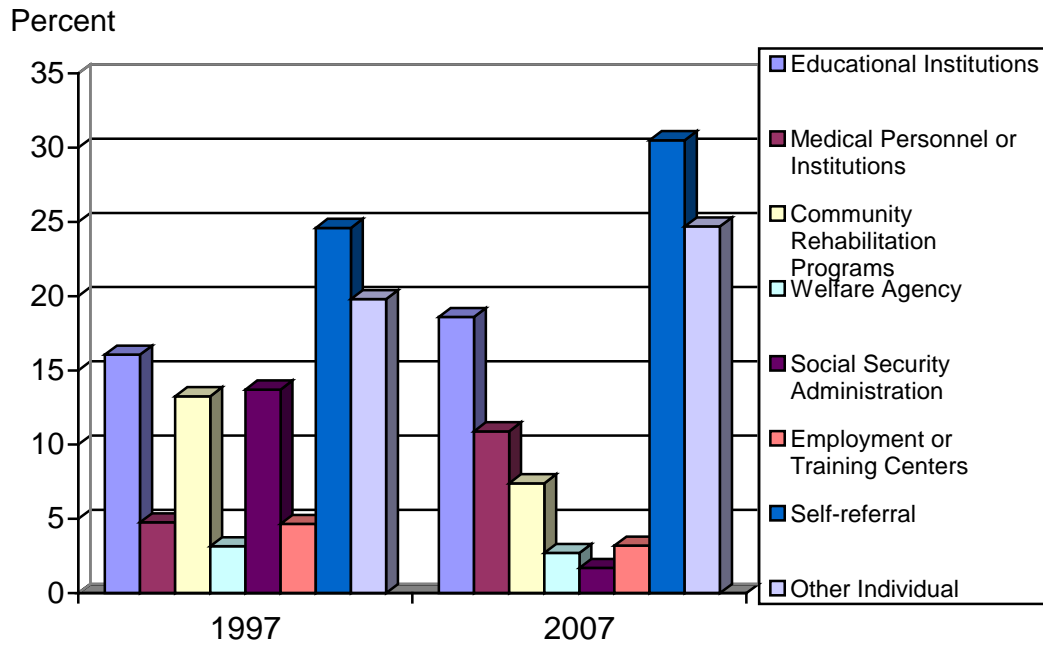


Figure 6: Referral Sources



Also summarized in figures 7 and 8 below are indications that a sizable proportion of VR consumers is dependent on public support including Social Security Disability Insurance (SSDI), Temporary Assistance to Needy Families, Supplemented Security Income (SSI), general public assistance and others.

Figure 7: Dependency on Public Support -1997

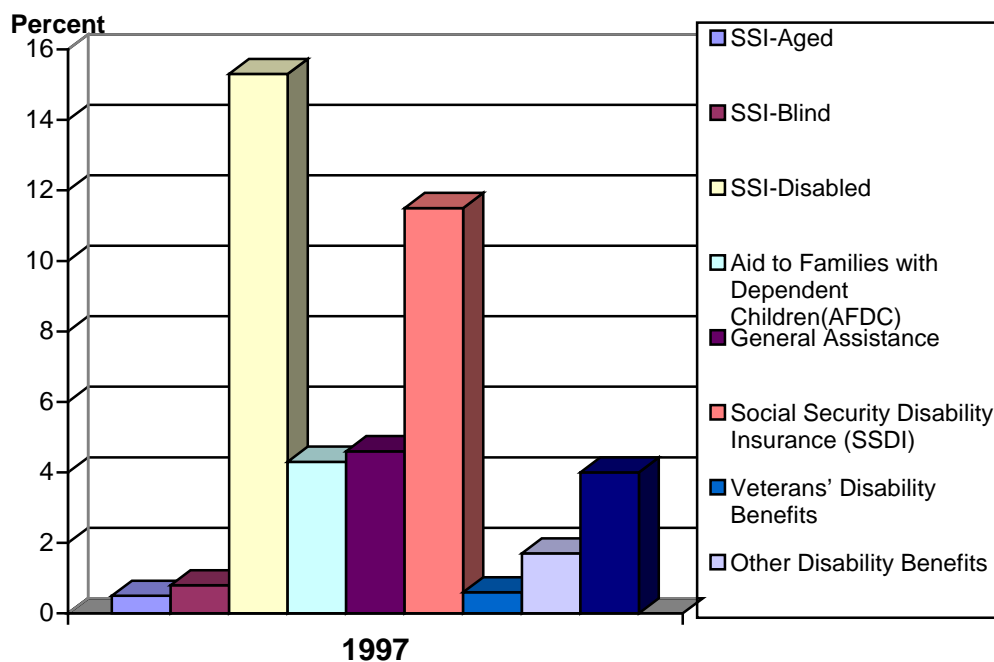
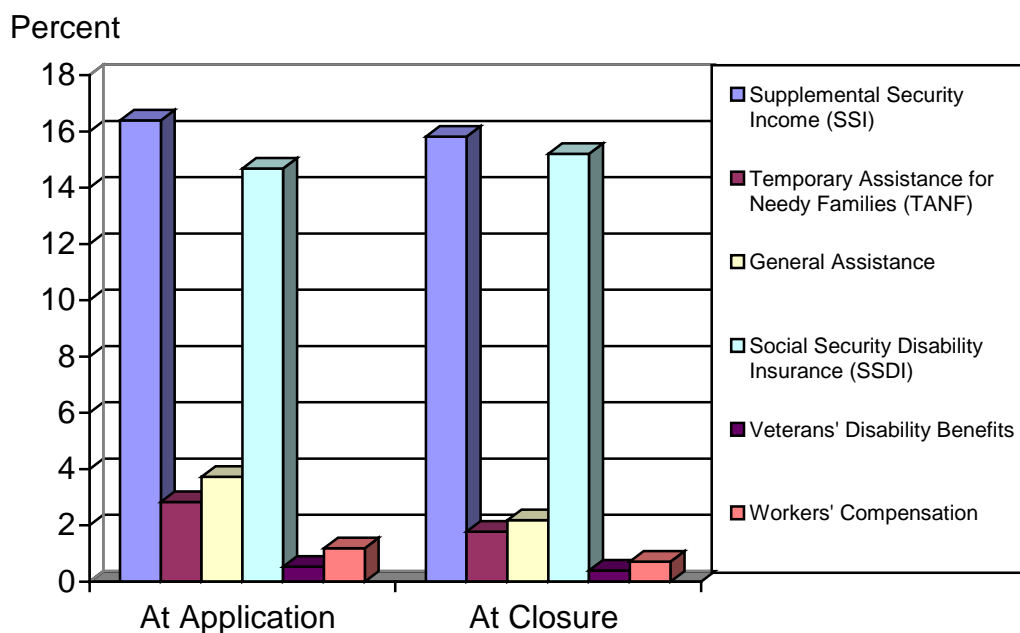


Figure 8: Dependency on Public Support - 2007



Figures 9 and 10 summarize the disability distributions in the study sample. They indicate that the largest proportion of disabilities represented in the sample is mental disabilities with physical disabilities as a close second. This is especially true of primary disabilities of both 1997 and 2007 consumers. It is also true of secondary disabilities in 1997. However, for the 2007 secondary disabilities, the largest proportion is sensory disabilities. It is important to point out that data collection definitions changed over time and the definitions in 2007 differ slightly from those used in 1997.

Figure 9: Disability Distributions 1997 Data

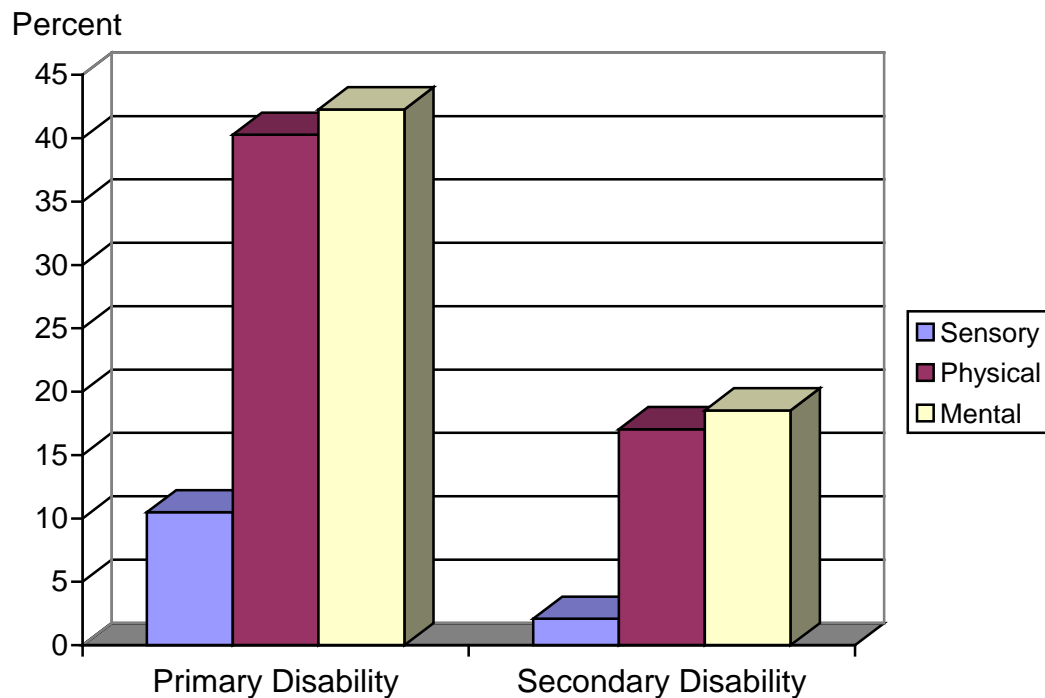
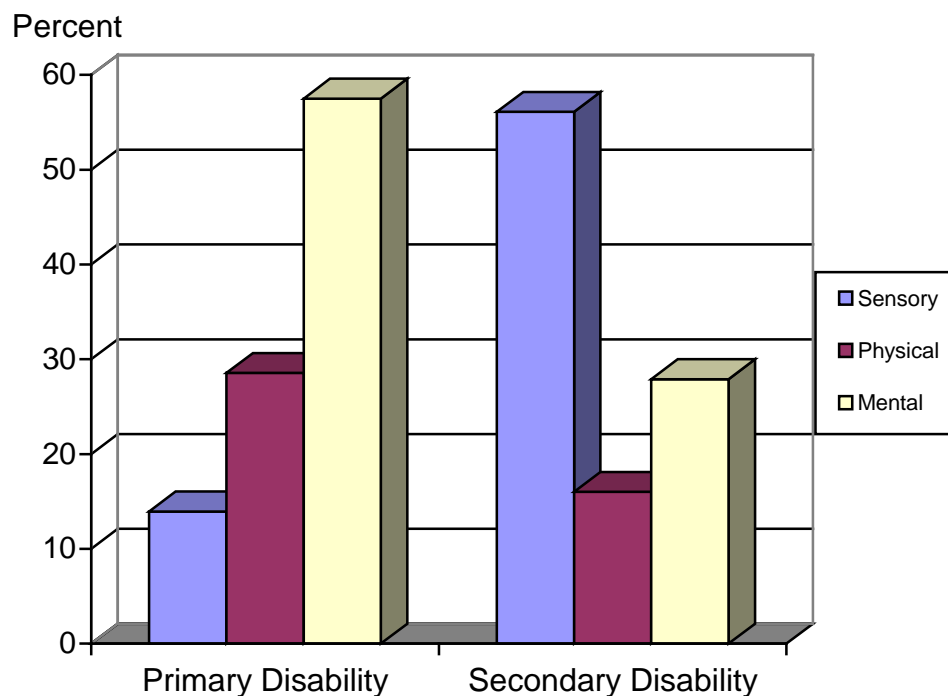


Figure 10: Disability Distributions 2007 Data



Study Results

Hypothesis 1: After the provisions of 1998 amendments to Section 21 of the Act took effect, there was no difference in waiting and intervention access periods of White and ethnic minority consumers

This hypothesis was tested with 1997 data and again with 2007 so as to discern changes that occurred subsequent to the 1998 amendments. The study tested the hypothesis in three forms: waiting periods from application to determination of eligibility; the length of time consumers accessed VR services from eligibility to closure and the length of time that elapsed between application for services and the time their cases were closed. The 2007 data includes the time the consumers waited between determinations of eligibility and the initialization of their individualized employment programs (IPE). Therefore the study tested this hypothesis using the

time that elapsed between eligibility and initialization of the IPE using the 2007 data. Hypothesis one results are presented in tables 1.1-1.7. Tests utilizing 1997 data are presented in tables 1.1-1.3 and those utilizing 2007 data are presented in tables 1.4 –1.7.

Tests with 1997 Data

Results of the tests utilizing 1997 data indicate statistically significant differences between White and ethnic minorities. African American and American Indian consumers waited for shorter periods (about 4-10 days shorter) for determinations of eligibility than did white consumers. However, once eligible, they were served for shorter periods (83-88 days shorter) than were their white counterparts. Asian/Pacific Islanders and non-white Hispanic waited for longer periods for eligibility determination than did white consumers. Asians/Pacific Islanders waited for 5 days longer while the non-white Hispanics waited for 20.5 days longer. These differences are statistically significant ($p < 0.01$).

Tests of the length of time consumers were served also showed statistically significant ($p < 0.01$) differences between Whites and ethnic minorities. Whites were served for 68.6 days longer than African Americans and for 90 days longer than American Indians. However, Asian/Pacific Islanders were served for 32 days longer than were white consumers. Non-white Hispanic consumers accessed services for 3 days longer than white consumers but this difference is statistically insignificant ($p < 0.01$) meaning that this differences is statistically equal to zero.

Tests of the length of time that elapsed from application to closure show that African Americans and American Indians had shorter experience periods with VR than did white consumers by 93 and 112 days respectively. However, Asian/Pacific Islanders had longer experiences than Whites by 53.6 days. These differences are statistically significant ($p < 0.01$). Non-white Hispanics experience periods with VR were 19.5 days shorter than for Whites and this difference is statistically significant ($p < 0.05$).

Table 1.1: T-tests of the mean differences in number of days consumers waited from application to eligibility determination - 1997 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	75.12					
African Americans	70.911	4.209**	8.728	0.0000	3.264	5.154
American Indian	65.033	10.087**	5.005	0.0000	6.136	14.037
Asian/ Pacific Islander	79.996	-4.876**	-2.666	0.0077	-8.461	-1.292
Non-White Hispanic	95.636	-20.517**	-8.746	0.0000	-25.115	-15.919

** Statistically significant (p<0.01)

Table 1.2: T-tests of the mean differences in number of days consumers were served from eligibility to closure - 1997 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	641.03					
African Americans	572.389	68.637**	30.178	0.0000	64.179	73.095
American Indian	550.967	90.059**	9.143	0.0000	70.753	109.365
Asian/ Pacific Islander	673.044	-32.018**	-3.718	0.0002	-48.896	-15.140
Non-White Hispanic	644.221	-3.195	-0.296	0.7672	-24.350	17.960

** Statistically significant (p<0.01)

Table 1.3: T-tests of the mean differences in number of days from application to closure - 1997 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Upper	Lower
Whites	573.76					
African Americans	480.592	93.172**	48.146	0.0000	89.379	96.965
American Indian	461.989	111.775**	13.467	0.0000	95.507	128.043
Asian/ Pacific Islander	627.333	-53.569**	-6.901	0.0000	-68.784	-38.354
Non-White Hispanic	554.241	19.523*	2.117	0.0342	1.450	37.595

** Statistically significant (p<0.01); * statistically significant (p<0.05)

Tests with 2007 Data

Unlike the findings from the 1997 data that indicated that Whites waited for longer periods for eligibility determination, results from the 2007 data indicate no significant differences except for African Americans who waited slightly longer than Whites. These results also indicate that Whites waited significantly longer for their IPE than did African Americans (27 days), American Indians (16 days) and Hawaiian consumers (20 days). However the difference in waiting periods for white consumers and for Asian consumers and non-white Hispanic consumers is smaller in magnitude and statistically insignificant. This means that the difference in waiting periods for White and Asian consumers is statistically equal to zero. The same is true for the difference between white and non-white Hispanics.

Similar to 1997, African American and American Indian consumers were served for shorter periods (35 and 24 days shorter respectively) than were their White counterparts. Also similar to 1997 Asian, Hawaiian consumers were served much longer than were white consumers by 102 and 122 days respectively. These differences are statistically significant ($p < 0.01$). The difference between access periods for white and non-white Hispanics is only 4 days and is statistically insignificant.

It is important to note that the difference in service access periods between White, African American and American Indians was smaller in 2007 than it was in 1997. Also important to note is that the service gap for the other minorities (Asians, Hawaiians) was much greater in 2007 than it was in 1997. The larger gap is to the advantage of Asian and Hawaiian/Pacific Island consumers. They were served for much longer than white consumers by 102 and 122 days respectively.

Tests of the overall length of consumer experience with VR – from application to closure- indicate statistically significant differences. African Americans experience was shorter than that of Whites by 69 days and that of American Indians was shorter by 70 days. However, Asians

had longer experiences by 100 days, Hawaiians by 101 days and non-white Hispanics by 33 days.

The results are mixed. Although there is a reduction in the service access gap for African American and American Indian consumers, there is still a statistically significant gap relative to white consumers. The study has to reject the hypothesis when applied to periods of service access/provision because there are statistically significant differences. The service access gap seems to have grown to the advantage of Asian and Hawaiian consumers. They access services for much longer periods than other consumers.

Hypothesis 1 is rejected for African American and American Indian consumers. For Asian, Hawaiian and non-white Hispanic consumers the changes between 1997 and 2007 seem to have worked in their favor. They access services for longer time periods.

Table 1.4: T-tests of the mean differences in number of days consumers waited from application to eligibility determination - 2007 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	40.56					
African Americans	41.17	-0.609**	-2.873	0.0041	-1.025	-0.194
American Indian	40.63	-0.077	-0.118	0.9062	-1.349	1.196
Asian	40.62	-0.067	-0.087	0.9308	-1.582	1.448
Hawaiian/PI	42.40	-1.842	-1.503	0.1329	-4.245	0.560
Non-White Hispanic	42.81	-2.257*	-2.259	.024	-4.21429	-.29885

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

Table 1.5: T-tests of the mean differences in number of days Consumers waited from eligibility determination to IPE - 2007 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	128.67					
African Americans	101.26	27.409**	23.267	0.0000	25.100	29.718
American Indian	112.56	16.111**	3.907	0.0001	8.029	24.193
Asian	120.29	8.384	1.862	0.0626	-0.440	17.208
Hawaiian/PI	108.35	20.321**	2.772	0.0056	5.953	34.688
Non-White Hispanic	117.41	11.26632	1.836	.066	-.7599	23.293

** Statistically significant (p<0.01)

Table 1.6: T-tests of the mean differences in number of days consumers accessed VR services from IPE to closure - 2007 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	675.21					
African Americans	639.88	35.332**	12.594	0.0000	29.833	40.830
American Indian	650.76	24.454**	2.556	0.0106	5.701	43.208
Asian	777.33	-102.126**	-9.775	0.0000	-122.602	-81.649
Hawaiian/PI	797.35	-122.137**	-7.196	0.0000	-155.401	-88.873
Non-White Hispanic	678.93	-3.71871	-.261	.794	-31.594	24.156

** Statistically significant ($p < 0.01$)

Table 1.7: T-tests of the mean differences in number of days from application to closure 2007 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	615.43					
African Americans	546.17	69.262**	33.836	0.0000	65.250	73.274
American Indian	545.28	70.152**	10.771	0.0000	57.387	82.917
Asian	715.32	-99.886**	-12.367	0.0000	-115.716	-84.057
Hawaiian/PI	716.14	-100.712**	-7.985	0.0000	-125.432	-75.991
Non-White Hispanic	582.23	33.20198**	3.319	0.001	13.596	52.808

** Statistically significant ($p < 0.01$)

Summary of Changes in Access 1997-2007

Although hypothesis one is rejected, there are notable changes that occurred between 1997 and 2007. A summary of those changes is depicted in table 1.8. The 2007 data indicate a decrease in difference in the waiting periods from application to determination of eligibility. While Whites waited significantly longer than African Americans and American Indians in 1997, they waited for shorter periods in 2007 but that difference is only statistically significant for African Americans. Non-white Hispanics waited significantly longer in 1997 and in 2007 but the gap decreased from 20.5 days in 1997 to 2.3 days in 2007. The gap in waiting periods for Whites and Asians/Pacific Islanders was significant in 1997 but insignificant in 2007. Thus the data indicate a closing gap in periods of waiting for eligibility determination.

Table 1.8: Summary of Difference in Access 1997 and 2007

Race	Application to Eligibility		Access length ^a		Application to Closure	
	1997	2007	1997	2007	1997	2007
African Americans	4.209**	-0.609**	68.637**	35.332**	93.172**	69.262**
American Indian	10.087**	-0.077	90.059**	24.454**	111.775**	70.152**
Asian		-0.067		-102.126**		-99.886**
Pacific Islander	-4.876**	-1.842	-32.018**	-122.137**	-53.569**	-100.712**
Non-White Hispanic	-20.517**	-2.257*	-3.195	-3.71871	19.523*	33.20198**

** Statistically significant ($p < 0.01$) * Statistically significant ($p < 0.05$)*

^a 1997 Eligibility to closure; 2007 IPE to closure

In comparing VR services access periods, it is important to note the data collection differences between 1997 and 2007. The 1997 records show days from eligibility to closure while the 2007 records indicate periods from IPE to closure. Thus the 1997 data might show longer access periods because they include periods that consumers waited for their IPEs. The data indicate the Whites accessed services for longer periods than African Americans and American Indians both in 1997 and 2007. Although the gap is statistically significant, it is smaller in 2007 than it was in 1997. In both 1997 and 2007, Asian, Hawaiian/Pacific Islander accessed services for longer periods than Whites. That gap more than doubles in 2007. The gap in services access periods between Whites and non-white Hispanics is statistically insignificant.

Hypothesis 2: After the provisions of 1998 amendments to Section 21 of the Act took effect, there was no difference in per capita expenditures on services rendered to White and to ethnic minority consumers

To test hypothesis 2, the study tested the statistical significance of the mean difference in per capita expenditures for services rendered to White and ethnic minority consumers. This hypothesis was tested twice using the 1997 data and again using 2007 data. Results are presented in tables 2.1 (for 1997 data) and 2.2 (for 2007 data).

The results indicate that in 1997, VR spent less per capita on African Americans (by \$480.76), less on American Indians (by \$711.95) and less on non-white Hispanics (by \$466.27)

than on white consumers. These differences are statistically significant ($p < 0.01$). However VR spent \$81.56 more on Asian/Pacific Islanders than on white consumers but this difference is statistically insignificant.

The same pattern is visible in 2007 when VR spent more per capita on white consumers than on: African Americans by \$625.67; American Indians by \$825.79; and non-white Hispanics by \$396.34. However, VR spent more on Asian consumers than on white consumers by \$516.26. These differences are statistically significant ($p < 0.01$). VR also spent less on Hawaiian consumers than on Whites by \$141.12 but this difference is statistically insignificant. These results suggest that the expenditure patterns did not change after the provisions of the 1998 amendments to Section 21 of the Act. Thus hypothesis 2 is rejected.

Table 2.1: T-tests of the mean differences in per capita cost of services rendered to White and to minority consumers - 1997 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Lower	Upper
Whites	1971.62					
Black	1490.85	480.76**	32.93	0.000	452.15	509.38
American Indian	1259.67	711.95**	11.60	0.000	591.67	832.23
Asian/Pacific Islander	2053.176	-81.56	-1.53	0.126	-186.05	22.927
Non-White Hispanic	1505.35	466.27**	6.597	0.0000	327.74	604.79

** Statistically significant ($p < 0.01$)

Table 2.2: T-tests of the mean differences in per capita cost of services rendered to White and to minority consumers - 2007 RSA-911 Data

Race	Mean	Mean Difference	t-Statistic	p-value	95% Confidence Interval of the Difference	
					Upper	Lower
Whites	2624.28					
Black	1998.61	625.67**	36.81	0.000	658.98	592.36
American Indian	1798.50	825.79**	18.52	0.000	913.19	738.38
Asian	3140.54	-516.26**	-5.05	0.000	716.64	315.88
Hawaiian/PI	2483.16	141.12	1.09	.275	394.29	-112.06
Non-White Hispanic	2227.94	396.34**	4.01	0.000	590.01	202.66

** Statistically significant ($p < 0.01$)

Summary of Expenditure Differences in 1997 and 2007

Although hypothesis 2 is rejected, it is important to note the changes that took place between 1997 and 2007. Table 2.3 juxtaposes 1997 and 2007 expenditure gaps. The data indicate a growing expenditure gap for African Americans and American Indians from \$480.76 in 1997 to \$625.67 in 2007 for African Americans. For American Indians the gap grew from \$711.95 to \$825.79. Thus the gap further disadvantaged African Americans and American Indians. The per capita expenditure gap between whites and Asians grew to the Asian's advantage. In 1997 VR spent \$ 81.56 per capita more for Asians than for Whites and that gap grew to \$516.26 in 2007. There gap for non-white Hispanics decreased from \$466.27 in 1997 to \$ 396.34 in 2007.

Table2.3: Summary of per capita expenditure differences in 1997 and 2007

Race/Ethnicity	1997 Data		2007 Data	
	Mean	Mean Difference	Mean	Mean Difference
Whites	1971.62		2624.28	
Black	1490.85	480.76**	1998.61	625.67**
American Indian	1259.67	711.95**	1798.50	825.79**
Asian/Pacific Islander	2053.176	-81.56	3140.54	-516.26**
			2483.16	141.12
Non-White Hispanic	1505.35	466.27**	2227.94	396.34**

** Statistically significant (p<0.01)

Hypothesis 3: After the provisions of 1998 amendments to Section 21 of the Act took effect, there was no difference in quality of services rendered to White and to ethnic minority consumers

To test this hypothesis, the study conducted t-tests of the statistical significance of the mean difference in services rendered to Whites and to other minorities. The tests were conducted with 1997 data and with 2007 data to discern any changes since the amendments. The statistical test results are presented by minority group in tables 3.1 through 3.9

African Americans

Results of analysis of the differences between services accessed by African Americans and Whites are presented in table 3.1 – for the 1997 data, and in table 3.2 for 2007 data. They

indicate statistically significant differences in access to all services offered by VR except for miscellaneous training and VR counseling. Furthermore, the results indicate that African Americans received proportionately more of adjustment and on- the job training, job finding, job placement, transportation and maintenance services than did Whites. On the other hand, Whites received more of all the other services including, assessment, restoration, college and vocational training, personal services, rehab engineering and assistive technology devices and services. Thus African Americans received less of the higher end training and services than did white consumers.

Table 3.1: T-tests of the mean differences in services rendered to White and to African American Consumers - 1997 RSA-911 Data

Services Rendered	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	0.00**	2.91	0.004	0.00	0.01
Restoration	0.01**	8.41	0.000	0.01	0.02
College	0.06**	53.91	0.000	0.06	0.07
Vocational Training	0.02**	16.17	0.000	0.02	0.02
Adjustment Training	-0.04**	-32.40	0.000	-0.04	-0.04
On -the-Job Training	-0.01**	-5.93	0.000	-0.01	0.00
Miscellaneous Training	0.00	-1.15	0.251	0.00	0.00
Counseling	0.00	0.16	0.869	0.00	0.00
Job Finding	-0.02**	-9.30	0.000	-0.02	-0.01
Job Placement	-0.01**	-4.56	0.000	-0.01	0.00
Transportation	-0.09**	-56.31	0.000	-0.09	-0.09
Maintenance	-0.04**	-29.95	0.000	-0.04	-0.04
Other services	0.01**	6.48	0.000	0.01	0.01
Personal	0.01**	6.19	0.000	0.01	0.01
Rehab Engineering	0.00**	11.04	0.000	0.00	0.01
Assistive Technology Devices	0.02**	19.97	0.000	0.02	0.02
Assistive Technology Services	0.01**	14.50	0.000	0.01	0.02

** Statistically significant ($p < 0.01$)

Results from the analysis of 2007 data indicate a similar pattern with slightly less access for African Americans to good quality training than in 1997. In 2007 they receive proportionately less of all services except job-readiness training, miscellaneous training and transportation. There are statistically significant differences in services accessed by African Americans and

those accessed by Whites. African Americans seem to be doing worse than they were in 1997 with respect to access to quality services. Hypothesis three is rejected for African Americans.

Table 3.2: T-tests of the mean differences in services rendered to White and to African American Consumers - 2007 RSA-911 Data

Service Rendered	Mean Difference	t-statistic	p-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	2.115**	28.736	0.0000	1.971	2.260
Diagnosis & Treatment	2.284**	30.114	0.0000	2.135	2.432
VR Counseling and Guidance	0.458**	18.612	0.0000	0.410	0.506
College/University Training	2.269**	52.799	0.0000	2.185	2.354
Vocational/Business Training	0.490**	11.937	0.0000	0.410	0.571
On-the-Job Training	0.216**	11.680	0.0000	0.179	0.252
Basic/Remedial Training	0.120**	8.057	0.0000	0.091	0.149
Job Readiness Training	-0.246**	-8.150	0.0000	-0.305	-0.187
Disability Skills Training	0.153**	9.189	0.0000	0.120	0.185
Miscellaneous Training	-0.198**	-5.311	0.0000	-0.271	-0.125
Job Search Support	0.663**	17.239	0.0000	0.588	0.738
Job Placement Support	0.208**	4.860	0.0000	0.124	0.292
On the Job Supports	0.318**	8.531	0.0000	0.245	0.392
Transportation	-2.056**	-33.683	0.0000	-2.175	-1.936
Maintenance	0.186**	4.166	0.0000	0.099	0.274
Rehabilitation Technology	1.510**	41.758	0.0000	1.439	1.581
Reader	0.022**	3.407	0.0007	0.009	0.035
Interpreter	0.067**	4.755	0.0000	0.039	0.094
Personal Attendant	0.047**	6.675	0.0000	0.033	0.061
Technical Assistance	0.261**	17.787	0.0000	0.232	0.289
Information & Referral	0.502**	21.269	0.0000	0.455	0.548
Other Services	0.287**	5.065	0.0000	0.176	0.398

** Statistically significant ($p < 0.01$)

American Indians

Results of analysis of differences between Whites and American Indians are presented in tables 3.3 and 3.4. Results from 1997 data indicate that Whites accessed proportionately more counseling, vocational training, job-placement, rehab engineering, and assistive technology services than did American Indians. However, American Indians accessed

proportionately more adjustment training, transportation, maintenance, and other services than did the white consumers. These differences are statistically significant ($p < 0.01$).

Similar to the results of African Americans, American Indians seem to fare worse in 2007 than in 1997. They receive proportionately less of the high-end training than Whites including: college/university training, vocational training, and disability argumentative skills training. They also receive proportionately less, diagnosis and treatment, job search, on the job supports, rehabilitation technology and technical assistance. However American Indians receive proportionately more transportation, maintenance, information and referral. There is an indication that American Indians fared worse in 2007 than in 1997 in the quality of services they received. Hypothesis 3 is rejected for American Indians.

Table 3.3: T-tests of the mean differences in services rendered to White and American Indians/Alaskan Natives Consumers - 1997 RSA-911 Data-

Services Rendered	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	-0.002	-0.40	0.687	-0.014	0.009
Restoration	0.012	1.89	0.059	0.000	0.025
College	-0.003	-0.65	0.515	-0.014	0.007
Vocational Training	0.012**	2.51	0.012	0.003	0.021
Adjustment Training	-0.012*	-2.32	0.020	-0.023	-0.002
On -the-Job Training	-0.005	-1.14	0.252	-0.012	0.003
Miscellaneous Training	0.013**	2.42	0.016	0.003	0.024
Counseling	0.030**	4.48	0.000	0.017	0.043
Job Finding	0.003	0.49	0.626	-0.010	0.017
Job Placement	0.029**	4.30	0.000	0.016	0.042
Transportation	-0.053**	-7.95	0.000	-0.066	-0.040
Maintenance	-0.042**	-7.71	0.000	-0.052	-0.031
Other services	-0.019**	-3.12	0.002	-0.031	-0.007
Personal	-0.001	-0.23	0.817	-0.013	0.010
Rehab Engineering	0.005**	2.73	0.006	0.002	0.009
Assistive Technology Devices	0.004	0.97	0.330	-0.004	0.011
Assistive Technology Services	0.011**	2.50	0.012	0.002	0.019

** Statistically significant ($p < 0.01$); * statistically significant ($p < 0.05$)

Table 3.4: T-tests of the mean differences in services rendered to White and American Indian Consumers - 2007 RSA-911 Data

Service Rendered	Mean Difference	t-statistic	p-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	-0.321	-1.389	0.1649	-0.774	0.132
Diagnosis & Treatment	4.667**	19.538	0.0000	4.199	5.135
VR Counseling and Guidance	0.170*	2.211	0.0271	0.019	0.320
College/University Training	0.485**	3.415	0.0006	0.207	0.764
Vocational/Business Training	0.335	2.580	0.0099	0.080	0.589
On-the-Job Training	-0.078	-1.304	0.1922	-0.195	0.039
Basic/Remedial Training	-0.025	-0.514	0.6072	-0.119	0.069
Job Readiness Training	0.214*	2.285	0.0223	0.030	0.397
Disability Skills Training	0.158**	2.975	0.0029	0.054	0.263
Miscellaneous Training	0.146	1.269	0.2046	-0.080	0.372
Job Search Support	0.312**	2.532	0.0113	0.070	0.553
Job Placement Support	0.283*	2.084	0.0372	0.017	0.549
On the Job Supports	0.415**	3.526	0.0004	0.184	0.645
Transportation	-3.388**	-18.028	0.0000	-3.756	-3.020
Maintenance	-1.897**	-13.416	0.0000	-2.174	-1.620
Rehabilitation Technology	0.978**	8.169	0.0000	0.744	1.213
Reader	0.032	1.553	0.1205	-0.008	0.073
Interpreter	0.073	1.650	0.0990	-0.014	0.160
Personal Attendant	-0.028	-1.188	0.2350	-0.074	0.018
Technical Assistance	0.114*	2.339	0.0194	0.018	0.209
Information & Referral	-0.221**	-2.975	0.0029	-0.366	-0.075
Other Services	0.255	1.436	0.1509	-0.093	0.602

** Statistically significant ($p < 0.01$); * statistically significant ($p < 0.05$)

Asians

Results for Asians are presented in tables 3.5 and 3.6. It is important to note the data collection changes that affect this analysis. In 1997 Asians were grouped together with Pacific Islanders. In 2007, they are treated as separate groups.

The 1997 data indicate significant differences in services accessed by Asians/Pacific Islanders relative to those accessed by Whites. Asians accessed proportionately more, assessment, adjustment training, miscellaneous training, job-finding, job-placement, transportation, other services, personal services, and rehab engineering. They accessed less

college training, restoration, and maintenance. They seem to fare better than African Americans or American Indians.

The 2007 data indicate a similar pattern to 1997 with Asian consumers accessing proportionately more of most services than Whites except for diagnosis and treatment college training, and maintenance services which Whites accessed proportionately more of. Although the differences seem in favor of the Asians, the fact that there are significant differences suggests that hypothesis three is rejected again.

Table 3.5: T-tests of the mean differences in services rendered to White and Asian/Pacific Islander Consumers 1997 RSA-911 Data

Services Rendered	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	-0.046**	-9.80	0.000	-0.055	-0.037
Restoration	0.075**	14.30	0.000	0.064	0.085
College	0.016**	3.80	0.000	0.008	0.024
Vocational Training	0.006	1.53	0.126	-0.002	0.014
Adjustment Training	-0.037**	-8.76	0.000	-0.046	-0.029
On -the-Job Training	-0.003	-1.06	0.287	-0.010	0.003
Miscellaneous Training	-0.021**	-4.69	0.000	-0.030	-0.012
Counseling	-0.010	-1.76	0.078	-0.020	0.001
Job Finding	-0.059**	-10.30	0.000	-0.071	-0.048
Job Placement	-0.045**	-8.22	0.000	-0.055	-0.034
Transportation	-0.046**	-8.66	0.000	-0.057	-0.036
Maintenance	0.041**	9.48	0.000	0.033	0.050
Other services	-0.036**	-7.26	0.000	-0.046	-0.027
Personal	-0.062**	-13.14	0.000	-0.071	-0.053
Rehab Engineering	-0.006**	-4.00	0.000	-0.009	-0.003
Assistive Technology Devices	0.004	1.38	0.168	-0.002	0.010
Assistive Technology Services	0.001	0.33	0.739	-0.006	0.008

** Statistically significant ($p < 0.01$)

Table 3.6: T-tests of the mean differences in services rendered to White and Asian Consumers - 2007 RSA-911 Data

Service Rendered	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	-0.706**	-2.477	0.0133	-1.264	-0.147
Diagnosis & Treatment	2.366**	8.015	0.0000	1.788	2.945
VR Counseling and Guidance	-0.421**	-4.437	0.0000	-0.607	-0.235
College/University Training	0.527*	3.008	0.0026	0.184	0.871
Vocational/Business Training	-0.679**	-4.236	0.0000	-0.993	-0.365
On-the-Job Training	-0.313**	-4.229	0.0000	-0.458	-0.168
Basic/Remedial Training	-0.234**	-3.941	0.0001	-0.350	-0.118
Job Readiness Training	-1.434**	-12.349	0.0000	-1.662	-1.207
Disability Augmentative Skills Training	-0.673**	-10.126	0.0000	-0.803	-0.542
Miscellaneous Training	-0.019	-0.132	0.8949	-0.298	0.260
Job Search Support	-2.775**	-18.171	0.0000	-3.074	-2.475
Job Placement Support	-3.191**	-18.974	0.0000	-3.521	-2.861
On the Job Supports	-0.290*	-1.998	0.0457	-0.575	-0.005
Transportation	-2.188**	-9.471	0.0000	-2.641	-1.735
Maintenance	0.824**	4.757	0.0000	0.484	1.163
Rehabilitation Technology	-0.285	-1.920	0.0548	-0.576	0.006
Reader	-0.153**	-5.883	0.0000	-0.204	-0.102
Interpreter	-1.011**	-18.127	0.0000	-1.121	-0.902
Personal Attendant	0.041	1.410	0.1585	-0.016	0.097
Technical Assistance	0.088	1.460	0.1443	-0.030	0.205
Information & Referral	-0.730**	-7.968	0.0000	-0.910	-0.551
Other Services	0.236	1.078	0.2809	-0.193	0.665

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

Hawaiians/Pacific Islanders

Because the 1997 data combined Asians and Pacific Islanders, the 1997 results for Hawaiians are discussed above under Asians and are presented in table 3.5. Results of analysis of 2007 data for Hawaiians/Pacific Islanders are presented in table 3.7. They indicate significant difference in services access by Hawaiians and Whites. Relative to white consumers Hawaiians accessed proportionately more assessment, vocational training, basic/remedial training, job-readiness, disability argumentative skill training, transportation, reader and interpreter services. Whites received proportionately more, diagnosis and treatment, VR counseling, college/university training, and on the job supports. Although the results do not necessarily

suggest that Whites fared better than Hawaiians/Pacific Islander in accessing VR services in 2007, there are significant access differences between these groups. Hypothesis three is again rejected.

Table 3.7: T-tests of the mean differences in services rendered to White and Hawaiian/Pacific Islander consumers - 2007 RSA-911 Data

Service Rendered	Mean Difference	t-statistic	p-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	-1.095**	-2.457	0.0140	-1.969	-0.221
Diagnosis & Treatment	4.701**	10.182	0.0000	3.796	5.606
VR Counseling and Guidance	0.597**	4.017	0.0001	0.306	0.888
College/University Training	0.685**	2.499	0.0124	0.148	1.223
Vocational/Business Training	-0.759**	-3.028	0.0025	-1.250	-0.268
On-the-Job Training	-0.183	-1.588	0.1124	-0.409	0.043
Basic/Remedial Training	-0.474**	-5.103	0.0000	-0.655	-0.292
Job Readiness Training	-0.948**	-5.242	0.0000	-1.303	-0.594
Disability Skills Training	-0.560**	-5.420	0.0000	-0.763	-0.358
Miscellaneous Training	0.173	0.778	0.4367	-0.263	0.609
Job Search Support	-0.402	-1.690	0.0911	-0.867	0.064
Job Placement Support	-0.027	-0.102	0.9191	-0.540	0.486
On the Job Supports	0.698**	3.078	0.0021	0.254	1.143
Transportation	-1.889**	-5.230	0.0000	-2.596	-1.181
Maintenance	0.145	0.536	0.5919	-0.386	0.677
Rehabilitation Technology	0.322	1.389	0.1647	-0.132	0.777
Reader	-0.227**	-5.600	0.0000	-0.306	-0.147
Interpreter	-1.022**	-11.837	0.0000	-1.191	-0.853
Personal Attendant	-0.091*	-2.009	0.0446	-0.180	-0.002
Technical Assistance	0.211	2.246	0.0247	0.027	0.394
Information & Referral	-0.139	-0.968	0.3329	-0.419	0.142
Other Services	-0.026	-0.076	0.9391	-0.697	0.645

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

Non-White Hispanics

The results for non-white Hispanics are presented in tables 3.8 and 3.9. The results from analysis of 1997 data indicate significant differences in access to VR services between Whites and non-white Hispanic consumers. Hispanic consumers accessed proportionately less assessment, restoration, college/university training, counseling, job-finding, and job placement.

They received more adjustment training, transportation, rehab engineering, and assistive technology services.

Results from the analysis of 2007 data indicate similar significant differences with Whites accessing more assessment, diagnosis and treatment, counseling, college/university training, job search and placement and on the job supports, maintenance and rehab technology. Hispanics received more of vocational, job readiness, disability skill and miscellaneous training that did white consumers. They also received more transportation, interpreter, and technical assistance service than did Whites. For the rest of the services, the differences were statistically insignificant ($p < 0.01$). These results indicate access patterns similar to 1997 for non-white Hispanics relative to access by Whites. There are still significant differences in the type of services received by non-white Hispanics relative to those received by white consumers. So the hypothesis is again rejected.

Table 3.8: T-tests of the mean differences in services rendered to White and non-white Hispanic Consumers - 1997 RSA-911 Data-

Services Rendered	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Assessment	0.083**	12.753	0.0000	0.070	0.096
Restoration	0.029**	4.022	0.0001	0.015	0.043
College	0.050**	8.565	0.0000	0.039	0.062
Vocational Training	0.005	0.975	0.3294	-0.005	0.016
Adjustment Training	-0.029**	-4.940	0.0000	-0.041	-0.018
On -the-Job Training	0.010	2.264	0.0236	0.001	0.019
Miscellaneous Training	0.008	1.313	0.1890	-0.004	0.020
Counseling	0.025**	3.296	0.0010	0.010	0.040
Job Finding	0.052**	6.489	0.0000	0.036	0.068
Job Placement	0.054**	7.195	0.0000	0.039	0.069
Transportation	-0.079**	-10.655	0.0000	-0.094	-0.065
Maintenance	-0.002	-0.394	0.6936	-0.014	0.010
Other services	-0.003	-0.494	0.6210	-0.017	0.010
Personal	-0.54**	-8.307	0.000	-0.067	-0.041
Rehab Engineering	-0.013**	-6.007	0.0000	-0.018	-0.009
Assistive Technology Devices	-0.004	-0.958	0.3380	-0.013	0.004
Assistive Technology Services	-0.015**	-3.289	0.0010	-0.025	-0.006

** Statistically significant ($p < 0.01$)

Table 3.9: T-tests of the mean differences in services rendered to White and to non-white Hispanic consumers – 2007 RSA-911 Data

Service Rendered	Mean Difference	t-statistic	p-Value	95% Confidence Interval of the Difference	
				Upper	Lower
Assessment	2.593**	7.332	.000	3.286	1.900
Diagnosis & Treatment	4.519**	12.326	.000	5.237	3.800
VR Counseling and Guidance	1.151**	9.766	.000	1.382	.920
College/University Training	.643**	2.952	.003	1.070	.216
Vocational/Business Training	-1.320**	-6.626	.000	-.930	-1.711
On-the-Job Training	.100	1.093	.274	.279	-.079
Basic/Remedial Training	.029	.390	.697	.173	-.115
Job Readiness Training	-.421**	-2.930	.003	-.139	-.702
Disability Skills Training	-.309**	-3.765	.000	-.148	-.469
Miscellaneous Training	-.693**	-3.914	.000	-.346	-1.040
Job Search Support	1.100**	5.838	.000	1.470	.731
Job Placement Support	.946**	4.551	.000	1.353	.539
On the Job Supports	.970**	5.390	.000	1.323	.617
Transportation	-4.086**	-14.231	.000	-3.523	-4.649
Maintenance	.533**	2.478	.013	.955	.111
Rehabilitation Technology	1.005**	5.462	.000	1.365	.644
Reader	.001	.033	.973	.063	-.061
Interpreter	-.402**	-5.893	.000	-.269	-.536
Personal Attendant	-.029	-.800	.424	.042	-.099
Technical Assistance	-.220**	-2.941	.003	-.073	-.366
Information & Referral	.423**	3.729	.000	.646	.201
Other Services	1.625**	5.987	.000	2.157	1.093

** Statistically significant (p<0.01)

Summary of Changes in Services Rendered between 1997 and 2007

Although there are changes in definitions of services rendered in 1997 and 2007 it is still possible to compare access to services across time because a number of services definitions that did not change or remained similar over time. A comparison of access to those services in 2007 and 1997 is presented in tables 3.10 and 3.11. There are indications of some changes in access gaps between minority and White consumers. The services rendered gap between Whites and African Americans seems to have widened in 2007. The data indicate that in 1997 there were no significant differences in access to miscellaneous training and counseling. In 2007 the differences are statistically significant. African Americans received more miscellaneous training in 2007. Also notable is the fact that in 1997 African Americans received proportionately

more adjustment and on-the-job training but in 2007 they received less of those services. In 1997, African Americans accessed more job finding, and placement and more maintenance services, but in 2007 they received less of these services.

Table 3.10: Comparison of mean differences in services rendered in 1997 and 2007 to Whites and African American, and American Indian Consumers

Services Rendered	African Americans		American Indians	
	1997 Mean Difference	2007 Mean Difference	1997 Mean Difference	2007 Mean Difference
Assessment	0.00**	2.115**	-0.002	-0.321
Restoration	0.01**	2.284**	0.012	4.667**
College	0.06**	2.269**	-0.003	0.485**
Vocational Training	0.02**	0.490**	0.012**	0.335
Adjustment Training	-0.04**	0.153**	-0.012*	0.158**
On -the-Job Training	-0.01**	0.216**	-0.005	-0.078
Miscellaneous Training	0.00	-0.198**	0.013**	0.146
Counseling	0.00	0.458**	0.030**	0.170*
Job Finding	-0.02**	0.663**	0.003	0.312**
Job Placement	-0.01**	0.208**	0.029**	0.283*
Transportation	-0.09**	-2.056**	-0.053**	-3.388**
Maintenance	-0.04**	0.186**	-0.042**	-1.897**
Other services	0.01**	0.287**	-0.019**	0.255
Personal	0.01**	0.047**	-0.001	-0.028
Rehab Engineering	0.00**	1.510**	0.005**	0.978**
Assistive Technology Services	0.02**	0.261**	0.004	0.114*

** Statistically significant (p<0.01)

There are also changes in services-rendered gaps between American Indians and Whites. In 1997 there were no differences in access to restoration, college and on-the-job training, job-finding and access to assistive technology devices. However, in 2007 the difference in access to these services was statistically significant. These data also indicate a closure in some service access gaps between Whites and American Indians such as access to vocational and miscellaneous training, access to assistive technology services and to other personal services. Similarly, there are some changes in differences in services rendered to White and Asian/Hawaiian/Pacific Islander consumers. In 1997 there were no differences in access to vocational and on-the-job training but 2007 data indicate significant differences with

Asians/Pacific Islanders receiving proportionately more of these services than Whites. On the other hand some gaps closed in 2007. These include access to personal service, rehabilitation technology and to other services.

Compared to 1997 where there were no significant differences between Whites and non-white Hispanics in access to vocational and miscellaneous training, in 2007 Hispanics received proportionately more of these services than did Whites. The opposite is true for access to maintenance and other services. Similar to 1997, there were no differences in access to on-the-job training for White consumers and for non-white Hispanics. In 2007 non-white Hispanic consumers received proportionately less rehab engineering, maintenance and other services the opposite was the case in 1997.

Table 3.11: Comparison of mean differences in services rendered in 1997 and 2007 to Whites and Asian, Hawaiian/Pacific Islander and Non-White Hispanic Consumers

Services Rendered	Asians/Pacific Islander	Asians	Hawaiian /Pacific islanders	Non-White Hispanics	
	1997 Mean Difference	2007 Mean Difference	2007 Mean Difference	1997 Mean Difference	2007 Mean Difference
Assessment	-0.046**	-0.706**	-1.095**	0.083**	2.593**
Restoration	0.075**	2.366**	4.701**	0.029**	4.519**
College	0.016**	0.527*	0.685**	0.050**	.643**
Vocational Training	0.006	-0.679**	-0.759**	0.005	-1.320**
Adjustment Training	-0.037**	-0.673**	-0.560**	-0.029**	-.309**
On -the-Job Training	-0.003	-0.313**	-0.183	0.010	.100
Miscellaneous Training	-0.021**	-0.019	0.173	0.008	-.693**
Counseling	-0.010	-0.421**	0.597**	0.025**	1.151**
Job Finding	-0.059**	-2.775**	-0.402	0.052**	1.100**
Job Placement	-0.045**	-3.191**	-0.027	0.054**	.946**
Transportation	-0.046**	-2.188**	-1.889**	-0.079**	-4.086**
Maintenance	0.041**	0.824**	0.145	-0.002	.533**
Other services	-0.036**	0.236	-0.026	-0.003	1.625**
Personal	-0.062**	0.041	-0.091*	-0.54**	-.029
Rehab Engineering	-0.006**	-0.285	0.322	-0.013**	1.005**
Assistive Technology Services	0.001	0.088	0.211	-0.015**	-.220**

** Statistically significant (p<0.01); * statistically significant (p<0.05)

Hypothesis 4: After the provisions of 1998 amendments to Section 21 of the Act took effect, there was no difference in VR intervention outcomes of White and ethnic minority consumers

The study measured outcomes in several ways including: consumer weekly hours worked, employment earnings, dependence on public support, and education levels and health insurance coverage for consumers. The study measured differences before and after receiving VR services using 1997 and 2007 data. The results of this analysis are presented in tables 4.1 through 4.27.

i) Employment and Earnings

The 1997 data indicated statistically significant differences in employment and earnings of White and minority consumers both before and after VR services. Tests of the differences are presented in tables 4.1 - 4.9 and are grouped by ethnic minority:

African Americans

The 1997 data indicate that on the average white consumers worked 2.01 hours more and earned \$15.39 more per week than African Americans before VR services. At closure, African Americans worked 1.49 hours more per week but earned \$18.54 **less** per week than their white counterparts. The 1997 numbers indicate that VR services improved wages of white consumers to a larger degree than the improvements experienced by African American consumers subsequent to VR services. These differences are statistically significant ($p < 0.01$).

Results of analysis of 2007 data indicate significant earnings differences between Whites and African Americans both before and after VR services. The gap before services was \$32.59 which widened to \$52.62 after VR services. These numbers indicate that VR services had a greater improvement effect on earnings of Whites than on earnings of African Americans. With earnings as a VR outcome indicator, hypothesis 4 is rejected with respect to African American consumers.

Table 4.1: T-tests of the mean differences in employment and earnings of White and African American Consumers at application and at closure - 1997 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	15.39**	42.35	0.000	14.68	16.10
Weekly hours worked	2.01**	46.13	0.000	1.93	2.10
AT CLOSURE					
Weekly earnings	18.54**	20.15	0.000	16.74	20.34
Weekly hours worked	-1.49**	-20.69	0.000	-1.63	-1.34

** Statistically significant ($p < 0.01$)

Table 4.2: T-tests of the mean differences in employment and earnings of White and African American Consumers at application and at closure - 2007 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	32.588**	60.033	0.0000	31.524	33.652
Weekly hours worked	2.454**	63.982	0.0000	2.379	2.529
AT CLOSURE					
Weekly earnings	52.620**	44.642	0.0000	50.309	54.930
Weekly hours worked	-.34**	5.76	0.000	-.4498	-.2214

** Statistically significant ($p < 0.01$)

American Indians

The 1997 data also indicate statistically significant differences in earnings of White and American Indian consumers. Before VR services, on the average, Whites worked 1.196 hours more and earned \$9.471 more per week than did American Indian consumers. After VR services, American Indians worked 1.203 hours more per week than did the Whites. These differences are statistically significant ($p < 0.01$). However, after VR services the difference between earnings of White and American Indian consumers is statistically insignificant. These numbers suggest an improvement in earnings of American Indians after VR services.

Analysis results of 2007 data indicate that the earnings gap between American Indians and Whites decreased after VR services (from \$29.98 per week to \$5.31). However this earnings difference is statistically significant therefore hypothesis 4 is rejected with respect to American Indians if employment and earnings are used as an indicator of VR outcomes.

Table 4.3: T-tests of the mean differences in employment and earnings of White and American Indian Consumers at application and at closure - 1997 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	9.471**	5.94	0.000	6.349	12.594
Weekly hours worked	1.196**	6.36	0.000	0.828	1.565
AT CLOSURE					
Weekly earnings	-0.893	-0.21	0.830	-9.062	7.276
Weekly hours worked	-1.203**	-3.77	0.000	-1.829	-0.578

** Statistically significant ($p < 0.01$)

Table 4.4: T-tests of the mean differences in employment and earnings of White and American Indian Consumers at application and at closure - 2007 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	29.983**	16.466	0.0000	26.414	33.552
Weekly hours worked	2.083**	16.652	0.0000	1.837	2.328
AT CLOSURE					
Weekly earnings	5.309**	22.963	0.0000	14.483	31.444
Weekly hours worked	-.56**	-2.73	0.006	-.99642	-.1577

** Statistically significant ($p < 0.01$)

Asian/Pacific Islanders

The 1997 data also indicate statistically significant differences in earnings of White and Asian/Pacific Islander consumers with Whites working more hours per week and also earning more. These differences persist even after VR services. Asian consumers earned \$19.95 less per week than white consumers before VR services and \$17.04 less after VR services. The

differences in earnings between Asians and Whites were statistically significant even after VR services.

2007 data also indicate a greater decrease in the earnings gap between Whites and Hawaiian/Pacific Islanders subsequent to VR intervention. Before services, the gap was \$19.63 per week and statistically significant. After services the earnings gap was reduced to only \$1.66 and statistically insignificant meaning that there was no difference in earning for these two groups.

Table 4.5: T-tests of the mean differences in employment and earnings of White and Asian/Pacific Island Consumers at application and at closure - 1997 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	11.112**	8.59	0.000	8.577	13.647
Weekly hours worked	1.660**	10.89	0.000	1.361	1.959
AT CLOSURE					
Weekly earnings	16.443**	5.17	0.000	10.212	22.674
Weekly hours worked	0.714**	2.93	0.003	0.237	1.191

** Statistically significant ($p < 0.01$)

Table 4.6: T-tests of the mean differences in employment and earnings of White and Asian Consumers at application and at closure 2007 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	19.947**	8.887	0.0000	15.548	24.346
Weekly hours worked	1.731**	11.272	0.0000	1.430	2.032
AT CLOSURE					
Weekly earnings	17.040**	3.176	0.0015	6.519	27.561
Weekly hours worked	1.33**	5.943	0.000	.8883	1.7713

** Statistically significant ($p < 0.01$)

Table 4.7: T-tests of the mean differences in employment and earnings of White and Hawaiian/Pacific Islander Consumers at application and at closure - 2007 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	19.631**	5.597	0.0000	12.757	26.505
Weekly hours worked	1.538**	6.391	0.0000	1.066	2.010
AT CLOSURE					
Weekly earnings	1.659	0.190	0.8492	-15.454	18.772
Weekly hours worked	.105	.269	.788	-.6619	.8723

** Statistically significant ($p < 0.01$)

Non-White Hispanics

There are also statistically significant differences in earnings of non-white Hispanics relative to those of Whites. 1997 data indicate that the earnings gap between Whites and non-white Hispanic consumers grew subsequent to VR services from \$13 to \$32 per week. However the gap in hours worked was reduced which is a further indication of much lower wage rates for non-white Hispanics than for white consumers. The 2007 data indicate that the earnings gap between white consumers and non-white Hispanics grew from \$36.23 at application to \$44.20 at closure. These differences are statistically significant ($p < 0.01$).

The hypothesis test results indicate statistically significant differences in earnings between Whites and minorities. Using earnings as an outcome indicator suggests that hypothesis 4 must be rejected.

Table 4.8: T-tests of the mean differences in employment and earnings of White and non-white Hispanic Consumers at application and at closure - 1997 RSA-911 Data

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
Weekly earnings	13.453**	7.470	0.0000	9.923	16.982
Weekly hours worked	1.700**	7.997	0.0000	1.283	2.116
AT CLOSURE					
Weekly earnings	32.538**	7.182	0.0000	23.658	41.419
Weekly hours worked	0.672	1.934	0.0531	-0.009	1.352

** Statistically significant ($p < 0.01$)

Table 4.9: T-tests of the mean differences in employment and earnings of White and non-white Hispanic Consumers at application and at closure - 2007 RSA-911 Data-

AT APPLICATION	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Upper	Lower
Weekly earnings	36.234**	13.036	.000	41.682	30.786
Weekly hours worked	2.792**	14.630	.000	3.166	2.418
AT CLOSURE					
Weekly earnings	44.198**	5.894	0.000	58.896	29.500
Weekly hours worked	-0.105	-0.339	0.734	0.500	-0.709

** Statistically significant (p<0.01)

i) Dependence on Public Support

People with disabilities experience high poverty rates. An important VR outcome is improvements in employment and earnings' capacity for people with disabilities which would in turn reduce their poverty rates. People with disabilities are often forced to depend on public support. The 1997 RSA-911 report several types of public support including:

- Supplemental Security Income (SSI)-Aged
- Supplemental Security Income (SSI)-Blind
- Supplemental Security Income (SSI)-Disabled
- Aid to Families with Dependent Children (AFDC)
- General Assistance - a payment made by a State or local government and would include State supplements to the Federal SSI program
- Social Security Disability Insurance (SSDI)
- Veterans' Disability Benefits - payments made by the Department of Veterans Affairs for partial or total disability
- Other Disability Benefits - cash payments to individuals by reason of disability other than those previously listed

- All Other Public Support Payments – all other cash payments to individuals for any reason other than disability

The 2007 data have similar support categories with slight variations as follows:

- Supplemental Security Income (SSI) for the Aged, Blind or Disabled
- Temporary Assistance for Needy Families (TANF)
- General Assistance (State or local government)
- Social Security Disability Insurance (SSDI)
- Veterans' Disability Benefits
- Workers' Compensation
- Other Public Support

This study used data on dependence on public support before and after VR services because reduction in such dependence is an important outcome. Note that the 1997 data did not include dependence on public support at closure so the study was only able to compare dependence at application. The 2007 data included public support dollar amounts both at application and at closure. The study analyzed differences at application and at closure. Analysis results of the 1997 and 2007 data indicate statistically significant differences between White and minority VR consumers in dependence on public support. The results are grouped by ethnic minority and are presented in tables 4.10 – 4.18.

African Americans

Results from the analysis of 1997 data suggest that African Americans had greater dependence on SSI-blind, SSI-disability, AFDC and General Assistance while Whites were more dependent on SSI-Aged, SSDI, Veteran Disability, and other disability. These differences are statistically significant ($p < 0.01$). The 1997 data did not include dependence on public support at closure so it was not possible to conduct an analysis of the differences at closure.

The study used per capita monthly dollar amounts received in public support to analyzing differences between Whites' and African Americans' dependence on public support with 2007 data. The results show significant differences both before and after VR services. Before VR services (at application) African Americans received more SSI and TANF dollars per capita than did white consumers. White consumers received more SSDI and all other public support dollars than did African Americans. These differences persisted even after VR services. Some of the differences were larger after VR services. For example, before VR services, on the average, Whites received \$14.17 per month more from SSDI than received by African Americans. After services, they received \$20.39 more per month. All other differences were smaller after VR services (see table 4.11).

Table 4.10: T-tests of the mean differences in per capita public support dollars received by White and African American VR consumers - 1997 RSA-911 Data

Variable	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
SSI Aged	0.001**	3.21	0.0013	0.000	0.001
SSI Blind	-0.003**	-8.09	0.0000	-0.004	-0.002
SSI Disability	-0.050**	-34.29	0.0000	-0.052	-0.047
AFDC	-0.023**	-28.10	0.0000	-0.025	-0.022
General Assistance	-0.037**	-43.90	0.0000	-0.039	-0.036
SSDI	0.035**	27.36	0.0000	0.033	0.038
Vet Disability	0.001**	2.49	0.0126	0.000	0.001
Other Disability	0.013**	23.51	0.0000	0.011	0.014
Other Public Support	0.015**	18.11	0.0000	0.013	0.016

** Statistically significant ($p < 0.01$)

Table 4.11: T-tests of the mean differences in per capita public support dollars received by White and African American VR consumers - 2007 RSA-911 Data

Source of Public Support Dollars At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
SSDI	14.170*	15.835	0.0000	12.416	15.924
SSI	-36.263**	-56.234	0.0000	-37.527	-35.000
TANF	-2.911**	-14.598	0.0000	-3.302	-2.520
All other Public Support	5.760**	7.924	0.0000	4.335	7.185
At Closure					
SSDI	20.390**	21.657	0.0000	18.545	22.235
SSI	-32.858**	-51.142	0.0000	-34.117	-31.598
TANF	-2.009**	-12.684	0.0000	-2.319	-1.698
all other Public Support	2.737**	4.875	0.0000	1.637	3.838

** Statistically significant ($p < 0.01$) * statistically significant ($p < 0.05$)

American Indians

1997 data also indicate that American Indians were more dependent on SSI-disability, AFDC, and General Assistance than white consumers were. These differences are presented in table 4.12 and they are statistically significant ($p < 0.01$).

The 2007 data indicate that white consumers received \$26.20 more per capita per month than American Indians in public support from SSDI before VR services. At closure, the gap had grown to \$29.92. American Indians received more of other public support dollars than did Whites both before and after VR services. These results are presented in table 4.13. The differences are statistically significant ($p < 0.01$).

Table 4.12: T-tests of the mean differences in per capita public support dollars received by White and American Indian VR consumers - 1997 RSA-911 Data

Variable	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
SSI Aged	0.001	0.66	0.509	-0.002	0.003
SSI Blind	0.001	0.42	0.677	-0.002	0.003
SSI Disability	-0.019**	-3.24	0.001	-0.031	-0.008
AFDC	-0.042**	-12.54	0.000	-0.048	-0.035
General Assistance	-0.043**	-12.96	0.000	-0.050	-0.037
SSDI	0.031**	5.59	0.000	0.020	0.042
Vet Disability	-0.012**	-8.71	0.000	-0.015	-0.009
Other Disability	0.003	1.08	0.278	-0.002	0.007
Other Public Support	-0.006	-1.60	0.109	-0.012	0.001

** Statistically significant (p<0.01)

Table 4.13: T-tests of the mean differences in per capita public support dollars received by White and American Indian VR consumers - 2007 RSA-911 Data

Source of Public Support Dollars	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
At Application					
SSDI	26.202**	9.225	0.0000	20.635	31.769
SSI	-20.900**	-10.813	0.0000	-24.689	-17.112
TANF	-13.529**	-21.902	0.0000	-14.740	-12.319
all other Public Support	-9.475**	-4.073	0.0000	-14.034	-4.915
At Closure					
SSDI	29.917**	9.975	0.0000	24.038	35.795
SSI	-19.965**	-10.325	0.0000	-23.755	-16.175
TANF	-10.184**	-20.628	0.0000	-11.151	-9.216
all other Public Support	-9.817**	-5.493	0.0000	-13.320	-6.315

** Statistically significant (p<0.01)

Asians/Pacific Islanders/Hawaiians

Tests of the differences between Whites' and Asians/Pacific Islanders' dependence on public support were conducted using both 1997 and 2007 RSA-911 data. These minority groups were analyzed together because of data limitation. The 1997 data grouped them together but they were treated as two separate groups in the 2007 data. The results of the statistical tests utilizing the 1997 data indicated that this minority group was more dependent on SSI-Blind, SSI-disability, AFDC, and General Assistance than were white consumers. On the other hand, white

consumers were more dependent on SSDI, Veteran Disability, Other public support and disability. These differences are statistically significant ($p < 0.01$).

Analysis of the 2007 treated these minorities in two groups- Asians and Hawaiians/Pacific Islanders in accordance with the groupings in the 2007 RSA-911 data. The results indicate statistically significant differences between Asian and white consumers' dependency on public support. 2007 data indicate that before VR services, Asian received \$46 more than Whites from SSI. The difference was reduced to \$40 after VR services. They received less SSDI by \$21 at application and by \$25 at closure (see table 4.15)

The 2007 data for Hawaiian/Pacific Islander VR consumers indicate that this minority group received \$22 more from SSI than did the Whites both before and after VR services. They also received more support from TANF and from other public support. However, Whites received more from SSDI by \$20 at application but this gap grew to \$28 at closure. These differences are statistically significant.

Table 4.14: T-tests of the mean differences in per capita public support dollars received by White and Asian/Pacific Islander VR consumers - 1997 RSA-911 Data

Variable	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
SSI Aged	-0.001	-0.62	0.534	-0.003	0.001
SSI Blind	-0.007**	-5.78	0.000	-0.009	-0.004
SSI Disability	-0.059**	-12.32	0.000	-0.068	-0.050
AFDC	-0.012**	-4.32	0.000	-0.017	-0.006
General Assistance	-0.028**	-10.19	0.000	-0.033	-0.022
SSDI	0.051**	11.33	0.000	0.042	0.059
Veteran Disability	0.003**	2.92	0.004	0.001	0.005
Other Disability	0.011**	5.97	0.000	0.008	0.015
Other Public Support	0.025**	8.80	0.000	0.019	0.030

** Statistically significant ($p < 0.01$)

Table 4.15: T-tests of the mean differences in per capita public support dollars received by White and Asian VR consumers - 2007 RSA-911 Data

Source of Public Support Dollars	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
At Application					
SSDI	21.197**	6.032	0.0000	14.309	28.084
SSI	-46.060**	-19.265	0.0000	-50.746	-41.374
TANF	-1.597*	-2.133	0.0329	-3.064	-0.129
all other Public Support	9.546**	3.324	0.0009	3.918	15.175
At Closure					
SSDI	24.943**	6.685	0.0000	17.630	32.256
SSI	-40.154**	-16.741	0.0000	-44.855	-35.453
TANF	-1.113	-1.866	0.0621	-2.283	0.056
all other Public Support	3.461	1.561	0.1186	-0.885	7.807

** Statistically significant (p<0.01)

Table 4.16: T-tests of the mean differences in per capita public support dollars received by White and Hawaiian/Pacific Islander VR consumers - 2007 RSA-911 Data

Source of Public Support Dollars	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
At Application					
SSDI	20.424**	3.716	0.0002	9.651	31.197
SSI	-22.043**	-5.920	0.0000	-29.340	-14.745
TANF	-7.267**	-6.205	0.0000	-9.562	-4.972
all other Public Support	-11.099**	-2.470	0.0135	-19.907	-2.291
At Closure					
SSDI	27.870**	4.761	0.0000	16.397	39.342
SSI	-22.411**	-5.981	0.0000	-29.756	-15.066
TANF	-4.153**	-4.439	0.0000	-5.987	-2.320
all other Public Support	-13.194**	-3.789	0.0002	-20.018	-6.369

** Statistically significant (p<0.01)

Non-White Hispanics

1997 RSA-911 data indicates that non-white Hispanics were more dependent on SSI-blind, AFDC, General Assistance, and from other public support than were white consumers. Whites were more dependent on other disability assistance. Public support differences between white consumers and non-white Hispanics were statistically insignificant.

Analysis of 2007 data also finds significant differences in amounts of public support dollars to non-white Hispanics relative to white consumers. Non-white Hispanics receive more SSI, TANF and other public support dollars both before and after VR services, although the gap is smaller after VR services. On the other hand, white consumers receive more SSDI dollars than non-white Hispanics and the gap was larger after VR services (see table 4.18). All public support dollar differences between white and non-white Hispanic are statistically significant.

In summary, there are statistically significant differences between White and minority consumers both before and after VR services. There are also differences before and after the 1998 Section 21 amendments went into effect. Therefore, the study has to reject hypothesis 4 when dependence on public support is used as a VR outcome indicator.

Table 4:17: T-tests of the mean differences in per capita public support dollars received by White and non-white Hispanic VR consumers - 1997 RSA-911 Data

Variable	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
SSI Aged	0.001	0.957	0.3388	-0.001	0.004
SSI Blind	-0.005**	-2.884	0.0039	-0.008	-0.002
SSI Disability	-0.010	-1.516	0.1294	-0.023	0.003
AFDC	-0.014**	-3.804	0.0001	-0.022	-0.007
General Assistance	-0.065**	-17.189	0.0000	-0.072	-0.057
SSDI	0.052**	8.306	0.0000	0.039	0.064
Vet Disability	0.002	1.391	0.1643	-0.001	0.005
Other Disability	0.010**	3.892	0.0001	0.005	0.016
Other Public Support	-0.031**	-7.774	0.0000	-0.038	-0.023

** Statistically significant (p<0.01)

Table 4.18: T-tests of the mean differences in per capita public support dollars received by White and non-white Hispanic VR consumers - 2007 RSA-911 Data

Source of Public Support Dollars At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Upper	Lower
SSDI	51.00**	11.711	.000	59.532	42.462
SSI	-28.18**	-9.524	.000	-22.380	-33.977
TANF	-5.01**	-5.400	.000	-3.194	-6.834
all other Public Support	-13.28**	-3.723	.000	-6.288	-20.270
At Closure					
SSDI	57.93**	12.623	.000	66.927	48.937
SSI	-20.39**	-6.921	.000	-14.616	-26.164
TANF	-3.65**	-4.967	.000	-2.209	-5.088
all other Public Support	-5.41*	-1.975	.048	-.041	-10.768

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

ii) Education and Medical Insurance

The last VR service outcomes indicator applied by the study is education and health insurance status. VR offers different types and levels of training for consumers who access VR services. Moreover, such training has an effect on the consumers' ability to be gainfully employed. Such employment in turn affects consumers' medical insurance status. Analysis of differences between White and minority education and insurance status indicate significant differences in 1997 and in 2007.

African Americans

Hypothesis testing results for this group are presented in tables 4.19 and 4.20. Analysis results for 1997 data indicate significant differences in education and health insurance between African Americans and white VR consumers. African Americans have significantly lower educational levels than white consumers and proportionately lower health insurance coverage than white consumers both before and after VR services.

Analysis of 2007 data also shows significant differences in education and health insurance both before and after VR services. These data indicate that African Americans have

proportionately more Medicaid than white consumers. However, white consumers have more insurance coverage from Medicare, other public insurance, employer-based insurance and other private insurance. These differences persist even after VR services.

Table 4.19: T-tests of the mean differences in education and medical insurance status of White and African American consumers - 1997 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Education	0.25**	31.83	0.000	0.23	0.26
Medical Insurance	0.06**	30.89	0.000	0.05	0.06
Job-based Insurance	-0.12**	-48.50	0.000	-0.12	-0.11
At Closure					
Medical Insurance	0.07**	27.83	0.000	0.07	0.08
Job-based Insurance	0.10**	26.25	0.000	0.09	0.10

** Statistically significant (p<0.01)

Table 4.20: T-tests of the mean differences in education and medical insurance status of White and African American consumers - 2007 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Educational Level	0.337**	70.088	0.0000	0.327	0.346
Medicaid	-0.095**	-68.726	0.0000	-0.097	-0.092
Medicare	0.008**	8.238	0.0000	0.006	0.010
Other Public Insurance	0.006**	10.999	0.0000	0.005	0.007
Private-employer insurance	0.033**	54.350	0.0000	0.032	0.034
Other Private insurance	0.106**	102.652	0.0000	0.104	0.108
At Closure					
Educational Level	0.487**	99.641	0.0000	0.477	0.496
Medicaid	-0.066**	-49.316	0.0000	-0.069	-0.064
Medicare	0.022**	21.905	0.0000	0.020	0.024
Other Public Insurance	0.005**	9.836	0.0000	0.004	0.006
Private-employer insurance	0.058**	57.498	0.0000	0.056	0.060
Other Private insurance	0.063**	64.042	0.0000	0.061	0.065

** Statistically significant (p<0.01)

American Indians

Hypothesis testing results for this group are presented in tables 4.21 and 4.22. They indicate significant differences in educational levels and insurance coverage for Whites and American Indian consumers. Similar to the differences between White and African American consumers, the differences with American Indians are indicated by 1997 and they persist in 2007 – even after VR services.

Table 4.21: T-tests of the mean differences in education and medical insurance status of White and American Indian/Alaskan Native consumers - 1997 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Education	0.205**	6.58	0.000	0.144	0.266
Medical Insurance	0.007	0.96	0.338	-0.008	0.022
Job-based Insurance	-0.055**	-5.30	0.000	-0.075	-0.035
At Closure					
Medical Insurance	0.045**	3.90	0.000	0.022	0.067
Job-based Insurance	-0.001	-0.07	0.942	-0.033	0.030

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

Table 4.22: T-tests of the mean differences in education and medical insurance status of White and American Indian consumers - 2007 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Educational Level	0.152**	10.040	0.0000	0.123	0.182
Medicaid	-13.846**	-0.058	0.0000	-0.066	-0.050
Medicare	0.792	0.003	0.4281	-0.004	0.009
Other Public Insurance	-39.702**	-0.068	0.0000	-0.071	-0.065
Private-employer insurance	26.279**	0.040	0.0000	0.037	0.043
Other Private insurance	17.585**	0.068	0.0000	0.060	0.076
At Closure					
Educational Level	0.227**	14.894	0.0000	0.197	0.257
Medicaid	-0.043**	-10.442	0.0000	-0.051	-0.035
Medicare	0.011**	3.429	0.0006	0.005	0.017
Other Public Insurance	-0.063**	-39.259	0.0000	-0.066	-0.059
Private-employer insurance	0.050**	15.140	0.0000	0.043	0.056
Other Private insurance	0.035**	10.691	0.0000	0.028	0.041
	0.002**	2.572	0.0101	0.000	0.004

** Statistically significant (p<0.01)

Asians/Pacific Islanders

The 1997 data groups Asians and Pacific Islanders together. The analysis results indicate statistically significant differences in educational levels and insurance coverage. 2007 data indicate that Asians have higher educational levels, and more dependence on Medicaid than do Whites at application. At closure (after VR services) they also have higher educational levels, more dependence on Medicaid and on other private insurance. Other insurance coverage differences are statistically insignificant.

The 2007 data on Hawaiian/Pacific Islander consumers indicate statistically significant differences in education, Medicaid, Medicare, and employer-based health insurance. Hawaiians had lower educational levels, and more dependence on Medicaid than did white consumers at application. At closure, Hawaiians still had lower educational levels, more dependence on Medicaid and other public support than did white consumers.

Table 4.23: T-tests of the mean differences in education and medical insurance status of White and Asian/Pacific Islander consumers - 1997 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Education	0.376**	13.71	0.000	0.323	0.430
Medical Insurance	0.015**	2.47	0.014	0.003	0.027
Job-based Insurance	-0.092**	-11.05	0.000	-0.109	-0.076
At Closure					
Medical Insurance	0.075**	8.54	0.000	0.058	0.092
Job-based Insurance	0.042**	3.42	0.001	0.018	0.066

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

Table 4.24: T-tests of the mean differences in education and medical insurance status of White and Asian consumers - 2007 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Educational Level	-0.169**	-8.963	0.0000	-0.206	-0.132
Medicaid	-0.064**	-12.394	0.0000	-0.074	-0.054
Medicare	0.018**	4.732	0.0000	0.010	0.025
Other Public Insurance	0.002	0.918	0.3587	-0.002	0.006
Private-employer insurance	0.014**	5.220	0.0000	0.009	0.019
Other Private insurance	-0.011*	-2.287	0.0222	-0.021	-0.002
At Closure					
Educational Level	-0.160**	-8.463	0.0000	-0.197	-0.123
Medicaid	-0.089**	-17.599	0.0000	-0.099	-0.079
Medicare	0.009*	2.219	0.0265	0.001	0.016
Other Public Insurance	0.002	0.888	0.3746	-0.002	0.005
Private-employer insurance	-0.001	-0.312	0.7549	-0.009	0.007
Other Private insurance	-0.027**	-6.598	0.0000	-0.035	-0.019

** Statistically significant ($p < 0.01$); * statistically significant ($p < 0.05$)

Table 4.25: T-tests of the mean differences in education and medical insurance status of White and Hawaiian/Pacific Islander consumers - 2007 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Educational Level	0.168**	5.738	0.0000	0.111	0.226
Medicaid	-0.057**	-7.028	0.0000	-0.073	-0.041
Medicare	0.022**	3.783	0.0002	0.010	0.033
Other Public Insurance	-0.005	-1.674	0.0941	-0.012	0.001
Private-employer insurance	0.013**	3.296	0.0010	0.005	0.021
Other Private insurance	-0.004	-0.594	0.5527	-0.019	0.010
At Closure					
Educational Level	0.145**	4.912	0.0000	0.087	0.203
Medicaid	-0.087**	-10.977	0.0000	-0.103	-0.072
Medicare	0.007	1.199	0.2305	-0.005	0.019
Other Public Insurance	-0.010**	-3.220	0.0013	-0.016	-0.004
Private-employer insurance	-0.005	-0.793	0.4276	-0.018	0.007
Other Private insurance	-0.001	-0.090	0.9280	-0.013	0.012

** Statistically significant ($p < 0.01$)

Non-White Hispanics

The 1997 data indicate statistically significant differences between Whites and non-white Hispanic consumers in education and health insurance both before and after VR services. The same is true in 2007. Non-white Hispanics have lower educational levels, more dependence on

Medicaid, less dependence on Medicare, employer-based health insurance and other private insurance than Whites both before and after VR services. These results indicate that the differences that existed in 1997 also persisted in 2007. Therefore hypothesis 4 is rejected with respect to education and health insurance status.

Table 4.26: T-tests of the mean differences in education and medical insurance status of White and non-white Hispanic consumers - 1997 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Lower	Upper
Education	1.032**	27.708	0.0000	0.959	1.105
Medical Insurance	0.018*	2.082	0.0374	0.001	0.035
Job-based Insurance	-0.110**	-9.446	0.0000	-0.133	-0.087
At Closure					
Medical Insurance	0.072**	5.768	0.0000	0.048	0.097
Job-based Insurance	-0.059**	-3.341	0.0008	-0.093	-0.024

** Statistically significant (p<0.01); * statistically significant (p<0.05)

Table 4.27: T-tests of the mean differences in education and medical insurance status of White and non-white Hispanic consumers - 2007 RSA-911 Data

At Application	Mean Difference	t-statistic	P-Value	95% Confidence Interval of the Difference	
				Upper	Lower
Educational Level	0.556**	23.805	0.000	0.601	0.510
Medicaid	-.191*	-29.652	0.000	-.178	-.203
Medicare	.045**	9.280	0.000	.055	.036
Other Public Insurance	.006*	2.251	0.024	.011	.001
Private-employer insurance	.038**	10.587	0.000	.045	.031
Other Private insurance	.076**	12.825	0.000	.088	.064
At Closure					
Educational Level	.576**	24.460	0.000	.622	.530
Medicaid	-.172**	-27.525	0.000	-.160	-.184
Medicare	.050**	10.384	0.000	.059	.041
Other Public Insurance	.003	1.475	0.140	.008	-.001
Private-employer insurance	.048**	9.572	0.000	.058	.038
Other Private insurance	.029**	5.735	0.000	.038	.019

** Statistically significant (p<0.01); * statistically significant (p<0.05)

Summary of changes in employment and earnings gaps 1997 to 2007

Hypothesis 4 is rejected with some notable changes between 1997 and 2007. The earnings gaps at closure in 2007 were wider than in 1997 for African Americans, American Indians and for non-white Hispanics. The earnings gap at closure between Asians and Whites was fairly stable between 1997 (\$16.44 per week) and 2007 (\$17.04 per week). The earnings gap between whites and Pacific Islanders was small and insignificant in 2007.

Table 4.28: Comparison of 1997 and 2007 mean differences in employment and earnings

	African Americans		American Indians		Asians		Non-white Hispanics	
	1997	2007	1997	2007	1997	2007	1997	2007
At Application								
Weekly earnings	15.39**	32.59**	9.50**	29.98**	11.11**	19.95**	13.45**	36.23**
Weekly hours worked	2.01**	2.45**	1.20**	2.08**	1.66**	1.73**	1.70**	2.79**
At Closure								
Weekly earnings	18.54**	52.62**	-0.89	5.31**	16.44**	17.04**	32.54**	44.20**
Weekly hours worked	-1.49**	-.34**	-1.20**	-.56**	0.71**	1.33**	0.67	-0.11

** Statistically significant ($p < 0.01$)

Hypothesis 5: After the provisions of 1998 amendments to Section 21 of the Act took effect, there was no difference in closure types for White and for ethnic minority consumers

Analysis of types of closure provides information about VR services access and outcomes. Closure types are summarized in figures 5.1 (1997 data) and 5.2 (2007 data). Over 60% of the consumers who sought VR services were closed “not rehabilitated”. Between 27% and 35% were closed “rehabilitated”. These data also indicate that proportionately more minorities were closed “not rehabilitated” than were Whites. Also noteworthy is the fact that more minorities were closed as applicants.

Figure 5.1: Closure Types - 1997

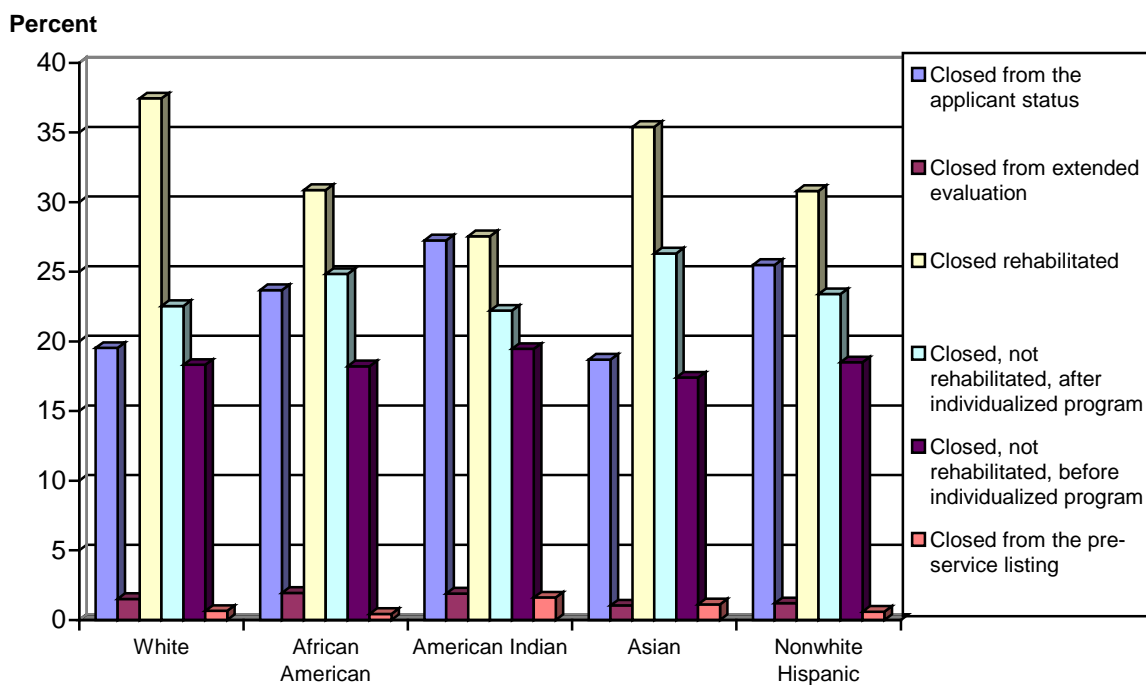
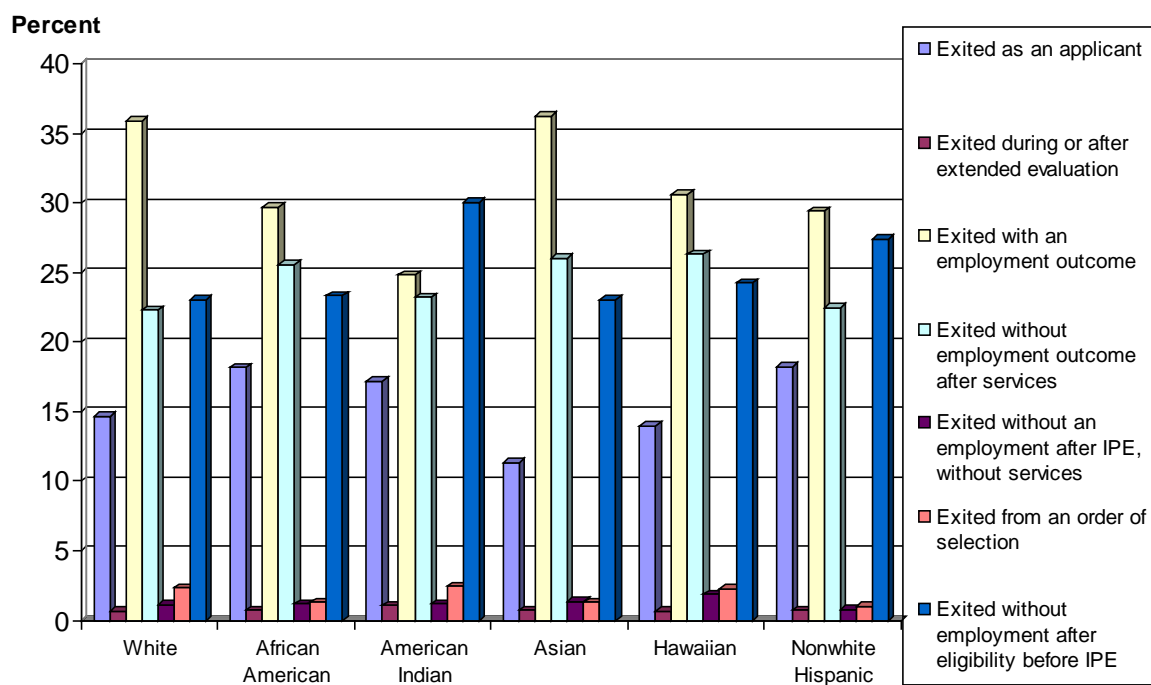


Figure 5.2: Closure Types - 2007



The 1997 data on closure types indicate that the 27% -37% of consumers were closed as rehabilitated. However, a large proportion were closed “not rehabilitated” before or after the initialization of their Individualized Program of Employment (IPE). These data also indicate differences in closure types for White and minority consumers. The 1997 data indicate that more minorities were determined ineligible for VR services than were Whites. 23.68% African Americans, 27.26% American Indians, 25.5% non-white Hispanics were determined ineligible for VR services or closed from the applicant status. 19.53% Whites and 18.69% Asians/Pacific Islanders were closed from the applicant status. Moreover, more minorities were closed “not rehabilitated” before and after the IPE. Statistical tests prove these differences to be significant ($p < 0.01$).

The minority group that had similar access and outcomes to those of Whites is the Asian/Pacific Islanders. These data also indicate that proportionately more Asian consumers were closed as rehabilitated. The minority group experiencing proportionately more poor outcomes in this respect was the American Indians. Furthermore, statistical tests of these differences indicate them to be significant ($p < 0.01$). Results of the statistical tests are presented in table 5.2.

Table 5.1 Proportions (%) by Types of Closure – 1997 Data

Closure Type	Whites %	Blacks %	American Indian %	Asian & Pacific Islander %	Non-White Hispanic %
Closed from the applicant status	19.53	23.68	27.26	18.69	25.5
Closed from extended evaluation	1.51	1.95	1.90	1.04	1.2
Closed rehabilitated	37.45	30.87	27.56	35.41	30.8
Closed, not rehabilitated, after individualized program	22.54	24.84	22.21	26.32	23.4
Closed, not rehabilitated, before individualized program	18.32	18.22	19.46	17.40	18.5
Closed from the pre-service listing	0.65	0.43	1.61	1.12	.6

Table 5.2: T-Test of the mean difference in closure types for White and minority consumers – 1997 RSA-911 Data

Closure Type or Reason	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
African Americans	0.07**	17.05	0.000	0.06	0.08
American Indian/ Alaska Native	0.110**	6.45	0.000	0.077	0.143
Asian/Pacific Islander	-0.055**	-3.77	0.000	-0.084	-0.027
Non-White Hispanic	0.11**	5.518	0.000	0.069	0.146

** Statistically significant ($p < 0.01$)

The 2007 data indicate that 25% to 36% of VR consumers were closed with an employment outcome. However, there are indications of differences in closure types for minority and white consumers. Similar to 1997, a larger proportion of minority consumers than of white consumers did not gain acceptance to VR programs and were closed as applicants: 18.17% African Americans; 17.22% American Indians and 18.2% non-white Hispanics. More of them also exited VR without employment outcomes. More disturbing is the fact that more minorities exited VR after being determined eligible but before they had a signed IPE. It is important to note here that the 2007 data indicate that Asian closure types are similar to those of Whites and that their outcomes are slightly better than those of white consumers. Statistical tests of these differences are presented in table 5.4 and they indicate that the differences in closure types for white and minority consumers are statistically significant. For this reason, hypothesis 5 is rejected.

Table 5.3 Proportions (%) by Types of Closure – 2007 Data

Closure Type	White %	Black %	American Indian %	Asian %	Hawaiian %	Non-White Hispanic %
Exited as an applicant	14.63	18.17	17.22	11.36	13.96	18.2
Exited during or after extended evaluation	0.64	0.74	1.05	0.74	0.69	.7
Exited with an employment outcome	35.91	29.70	24.82	36.21	30.63	29.4
Exited without an employment outcome, after receiving services	22.31	25.57	23.23	26.02	26.33	22.5
Exited without an employment outcome, after a signed IPE, but before receiving services	1.13	1.18	1.19	1.33	1.85	.8
Exited from an order of selection	2.31	1.31	2.44	1.28	2.28	1.0
Exited without an employment outcome, after eligibility, but before an IPE was signed	23.06	23.33	30.05	23.06	24.25	27.4

Table 5.4: T-Test of the mean difference in types of closure for White and minority consumers – 2007 RSA-911 Data

Closure Type or Reason	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
African Americans	0.056**	9.307	0.0000	0.044	0.068
American Indian/ Alaska Native	-0.238**	-12.748	0.0000	-0.274	-0.201
Asian	-0.072**	-3.260	0.0011	-0.115	-0.029
Hawaiian/ Pacific Islander	-0.118**	-3.296	0.0010	-0.189	-0.048
Non-White Hispanic	-.060*	-2.112	.035	-.004	-.116

** Statistically significant (p<0.01) * Statistically significant (p<0.05)

Multivariate Analysis of Closure Types: Estimating the probability of a successful closure

The study further explored whether minority status is a significant predictor of successful closures. Using the 1997 data, this analysis was done through logistic regression that estimated the likelihood of a successful closure (closure type 26 – rehabilitated) as a function of:

- individual demographic characteristics including gender, age, marital status, and minority status;

- individual socioeconomic status indicators (SES) including: educational level at application, employment at application in form of weekly hours worked and weekly earnings and dependency on public support defined as per capita dollar amounts received from public sources; and
- service provision factors including type of services received, cost of services and the length of time that the consumer received services from VR.

Because of differences in data collection and definitions in 1997 and 2007, the multivariate analysis for 2007 used a slightly different measure for a successful closure. The measure used is competitive employment. Using 2007 data, the study estimated the likelihood of achieving competitive employment outcome as a function of the demographic, socioeconomic and service provision factors.

The results of this analysis are presented in tables 5.5 and 5.6. They indicate that minority status has a negative and statistically significant effect on the probability of successful closure. Furthermore, even after controlling for other individual and service provision factors, minority status is a statistically significant predictor of successful closures. Minorities experience a reduced likelihood of successful closures relative to their white counterparts.

Table 5.5: Likelihood of successful closures (Rehabilitated) – 1997 Sample

	B	Wald	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
					Lower	Upper
Individual Demographic characteristics						
age	0.01	460.36	0.0000	1.008	1.007	1.009
Gender	0.05	38.44	0.0000	1.055	1.037	1.073
Minority Status	-0.08	170.93	0.0000	0.919	0.908	0.931
Marital Status	-0.04	206.84	0.0000	0.959	0.954	0.965
Education levels at application	0.01	21.05	0.0000	1.009	1.005	1.013
Severe Disability	-0.20	381.12	0.0000	0.817	0.801	0.834
Individual Socioeconomic Factors						
Migrant Worker	-0.32	21.02	0.0000	0.723	0.629	0.830
Veteran Status	-0.24	153.41	0.0000	0.786	0.757	0.817
Weekly Earnings at application	0.00	104.31	0.0000	1.001	1.001	1.001
Weekly work Hours at application	0.02	910.10	0.0000	1.020	1.019	1.022
Public support dollars at application	0.00	1734.09	0.0000	0.999	0.999	0.999
Services access factors						
Service access days	0.00	199.67	0.0000	1.000	1.000	1.000
Per capita expenditures	0.00	3005.38	0.0000	1.000	1.000	1.000
Restoration	0.67	4446.33	0.0000	1.956	1.918	1.995
College training	0.53	1541.33	0.0000	1.696	1.652	1.741
Vocational training	0.55	1535.07	0.0000	1.729	1.683	1.778
Adjustment training	0.42	1133.42	0.0000	1.521	1.484	1.558
On-the-Job training	0.52	524.04	0.0000	1.688	1.614	1.765
Miscellaneous training	0.28	485.48	0.0000	1.326	1.293	1.359
Counseling	0.27	748.46	0.0000	1.308	1.283	1.333
Job Search	0.72	1977.47	0.0000	2.045	1.981	2.110
Job Placement	1.09	3487.72	0.0000	2.963	2.858	3.072
Transportation	-0.04	16.34	0.0001	0.958	0.939	0.978
Maintenance	0.03	7.24	0.0071	1.035	1.009	1.061
Other services	0.44	1786.91	0.0000	1.558	1.527	1.591
Rehab Engineering	0.43	119.91	0.0000	1.534	1.421	1.656
Assistive Technology Devises	0.68	281.31	0.0000	1.967	1.817	2.129
Assistive Technology Services	0.20	30.77	0.0000	1.220	1.137	1.309
Correct Prediction 73.1%; Nagelkerke R ² =0.32; -2 Log likelihood = 346670.66						

Table 5.6: Likelihood of attaining competitive employment at closure – 2007 Sample

	B	Wald	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
					Lower	Upper
Individual Demographic characteristics						
Gender	-0.62	553.96	0.0000	0.54	0.51	0.57
Minority Status	-0.24	57.81	0.0000	0.79	0.74	0.84
Education levels at application	0.07	63.78	0.0000	1.07	1.05	1.09
Severe Disability	-0.48	40.49	0.0000	0.62	0.53	0.72
Individual Socioeconomic Factors						
Migrant Worker	0.58	12.89	0.0000	1.78	1.30	2.45
Veteran Status	-0.29	17.58	0.0000	0.75	0.66	0.86
Weekly Earnings at application	0.01	368.97	0.0000	1.01	1.01	1.01
Weekly work Hours at application	-0.01	18.99	0.0000	0.99	0.98	0.99
Public Support at application						
Monthly SSDI \$	0.00	436.29	0.0000	1.00	1.00	1.00
Monthly SSI\$	0.00	1463.52	0.0000	1.00	1.00	1.00
Monthly TANF\$	0.00	0.27	0.6040	1.00	1.00	1.00
Monthly Other Public support \$	0.00	118.13	0.0000	1.00	1.00	1.00
Services access factors						
Service access days	0.00	173.92	0.0000	1.00	1.00	1.00
Per capita expenditures	0.00	56.05	0.0000	1.00	1.00	1.00
Assess	-0.28	90.24	0.0000	0.76	0.71	0.80
Diagnosis & Treatment	-0.11	16.10	0.0000	0.90	0.86	0.95
College training	1.37	569.22	0.0000	3.94	3.52	4.41
Vocational training	0.69	237.35	0.0000	2.00	1.83	2.18
On-the-job training	0.07	1.19	0.2750	1.08	0.94	1.23
Remedial training	0.24	5.39	0.0200	1.27	1.04	1.54
Job-Readiness training	-0.04	1.00	0.3180	0.96	0.89	1.04
Disability Skills training	-1.68	2013.76	0.0000	0.19	0.17	0.20
Miscellaneous training	-0.60	346.22	0.0000	0.55	0.52	0.59
Job Search	0.61	262.98	0.0000	1.84	1.71	1.98
Job Placement	0.82	604.85	0.0000	2.27	2.13	2.42
Job support	0.35	100.82	0.0000	1.41	1.32	1.51
Transportation	0.25	68.01	0.0000	1.29	1.21	1.37
Maintenance	0.62	211.66	0.0000	1.86	1.71	2.02
Rehabilitation technology	-1.09	1100.73	0.0000	0.34	0.32	0.36
Reader	0.30	2.69	0.1010	1.36	0.94	1.95
Interpreter	0.22	4.64	0.0310	1.25	1.02	1.53
Personal Attendant	-1.02	51.90	0.0000	0.36	0.27	0.48
Technical Assistance	0.55	68.88	0.0000	1.74	1.52	1.98
Information & Referral	-0.31	88.75	0.0000	0.73	0.68	0.78
Other Services	-0.08	8.53	0.0030	0.92	0.87	0.97
Correct prediction = 96.5%; Nagelkerke R ² =.251; -2 Log likelihood = 50112.977						

Comparison of 1997 and 2007 closure types

Although hypothesis 5 is rejected there are notable changes between 1997 and 2007.

Table 5.7 presents a comparison of 1997 and 2007 closure types. In 2007 smaller proportions of all consumers were closed out as applicants, or after an extended evaluation. Also notable is the fact that in 2007 smaller proportions were closed rehabilitated with employment outcomes than was the case in 1997 for all consumer groups studied. The only exception is Asians whom experienced an improvement from 35% to 36% closed with employment outcomes.

Table 5.7 Proportions (%) by Types of Closure – 1997 Data

Closure Type	Whites %		Blacks%		American Indian %	
	1997	2007	1997	2007	1997	2007
Closed from the applicant status	19.53	14.63	23.68	18.17	27.26	17.22
Closed from extended evaluation	1.51	0.64	1.95	0.74	1.90	1.05
Closed rehabilitated	37.45	35.91	30.87	29.70	27.56	24.82
Closed, not rehabilitated, before individualized program	18.32	23.06	18.22	23.33	19.46	30.05
Closed from the pre-service listing	0.65	2.31	0.43	1.31	1.61	2.44
Closure Type	Asian & Pacific Islander%		Hawaiian		Non-White Hispanic%	
	1997	2007	2007		1997	2007
Closed from the applicant status	18.69	11.36	13.96		25.5	18.2
Closed from extended evaluation	1.04	0.74	0.69		1.2	0.7
Closed rehabilitated	35.41	36.21	30.63		30.8	29.4
Closed, not rehabilitated, before individualized program	17.40	23.06	30.05		18.5	27.4
Closed from the pre-service listing	1.12	1.28	2.28		0.6	1.0

Hypothesis 6: After the provisions of 1998 amendments to Section 21 of the Act took effect, there was no difference between reasons for closures of White and of ethnic minority consumers

Data analysis for this hypothesis provides important information on the quality or effectiveness of the process of service provision by VR. This hypothesis was tested using 1997 data and 2007 data. The reasons listed for closure can be grouped in two, those that relate to

the conditions of the consumer and those that relate to the service provision system and process.

The distribution of closure reasons for 1997 data is presented in figure 6.1. These data indicates that three reasons account for a large proportion of VR case closures: “unable to locate”, “refused further services”, and “failure to cooperate”. These data also indicate that of the three reasons, a larger proportion of white clients were closed for refusing services. Proportionately more minority consumer cases were closed for “unable to locate” and “failure to cooperate”. Statistical tests of the significance of differences in closure reasons for Whites and minorities indicate that the differences are not statistically significant (see table 6.2). The only statistically significant difference is between Whites and non-white Hispanic consumers.

The 2007 data indicate 25%-36% of all clients were closed with an employment outcome. The rest were closed for reasons similar to those indicated by the 1997 data: “failure to cooperate”, “refused further services” and “unable to locate”. Furthermore, the data indicate that there are differences in closure reasons for White and minority consumers. Proportionately more white consumers were closed with an employment outcome. A comparison across minorities indicates that more Asians were closed with an employment outcome. The group with the smallest proportion of such successful closures was the American Indians. These data also indicate that proportionately more minority cases were closed for “unable to locate or contact” and for “failure to cooperate”. Statistical tests of these differences (see table 6.4) indicate that the differences in 2007 closure reasons between Whites and African Americans, American Indians and non-white Hispanics are statistically significant ($p < 0.01$). This is a change from 1997 data that indicated statistically significant differences only between Whites and non-white Hispanics. However, the difference between closure reasons for Whites and Asian and Hawaiian consumers is statistically insignificant ($p < 0.01$). These results suggest that the 1997 data indicate that hypothesis 6 is accepted except for non-white Hispanics. The tests using

2007 data reject the hypothesis for African American, American Indians and for non-white Hispanics. The hypothesis is accepted for Asian and Hawaiian consumers.

Figure 6.1: Closure Reasons - 1997

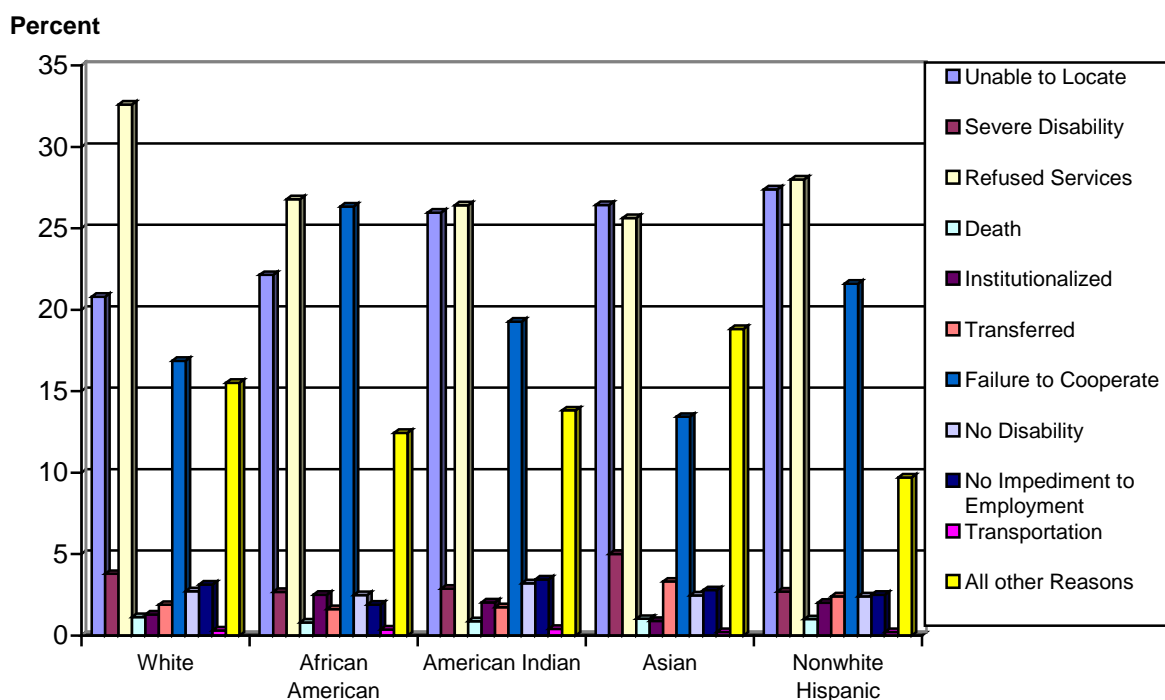


Table 6.1: Reasons for Closure – 1997 RSA-911 Data

REASON	White	Black	American Indian	Asian/Pi	Non-White Hispanic
Unable to locate or contact; or moved	20.79	22.14	25.97	26.44	27.4
Disability too severe or unfavorable medical prognosis	3.78	2.68	2.87	5.00	2.7
Refused services or further services	32.61	26.78	26.41	25.63	28.0
Death	1.13	0.79	0.87	1.02	1.0
Client institutionalized	1.29	2.49	2.02	0.89	2.0
Transferred to another agency	1.88	1.61	1.74	3.31	2.4
Failure to cooperate	16.86	26.34	19.27	13.43	21.6
No disabling condition	2.72	2.48	3.20	2.46	2.4
No impediment to employment	3.12	1.89	3.43	2.78	2.5
Transportation not feasible or available	0.30	0.36	0.40	0.20	.2
All other reasons	15.52	12.44	13.82	18.83	9.7

Table 6.2: T-Test of the mean difference in reasons for closure for White and minority consumers – 1997 RSA-911 Data

Closure Type or Reason	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Lower	Upper
African Americans	-0.02	-1.17	0.242	-0.04	0.01
American Indian/ Alaska Native	0.094	1.66	0.096	-0.017	0.205
Asian	-0.029	-0.56	0.573	-0.130	0.072
Non-White Hispanic	0.486**	7.334	0.000	0.356	0.616

** Statistically significant ($p < 0.01$)

Figure 6.2: Closure Reasons - 2007

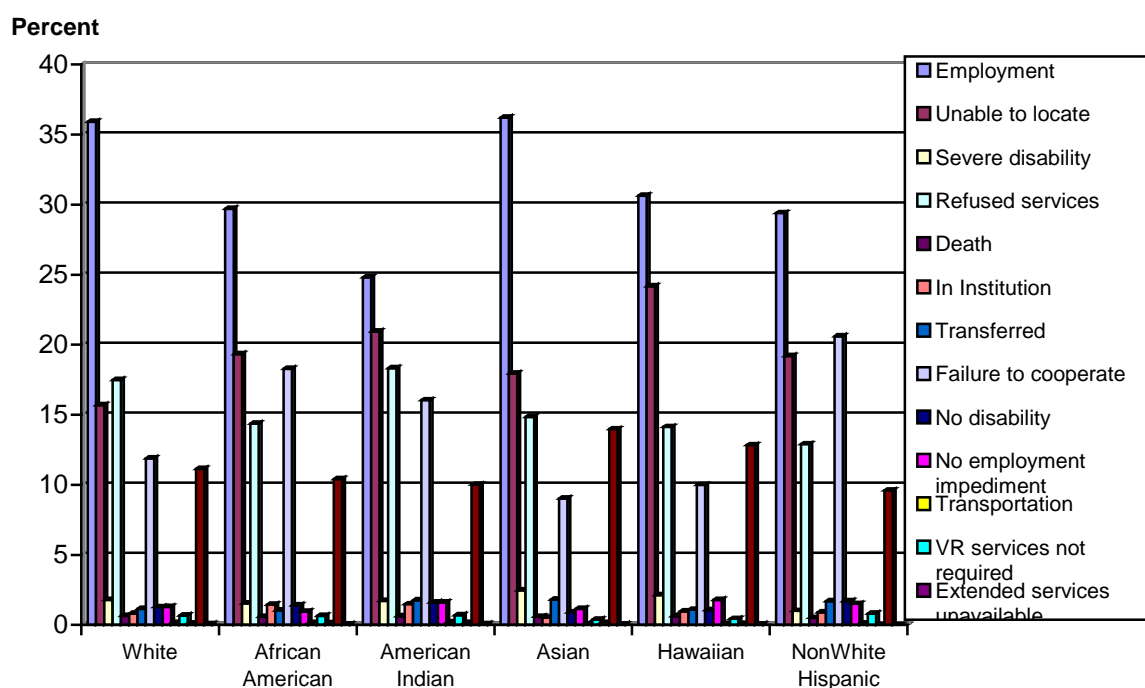


Table 6.3: Reasons for Closure – 2007

REASON	WHIT E	BLA CK	AMERIC AN INDIAN	ASIA N	HAWAIIA N	NON-WHITE HISPANI C
Achieved employment outcome	35.91	29.70	24.82	36.21	30.63	29.4
Unable to locate or contact	15.68	19.33	20.95	17.94	24.18	19.2
Disability too significant to benefit from services	1.78	1.54	1.71	2.46	2.12	1.0
Refused Services or Further Services	17.49	14.37	18.33	14.84	14.13	12.9
Death	0.65	0.58	0.62	0.59	0.63	.5
Individual in Institution	0.80	1.45	1.48	0.52	0.96	.9
Transferred to another agency	1.15	1.04	1.76	1.80	1.09	1.7
Failure to cooperate	11.88	18.29	16.04	9.03	9.99	20.6
No disabling condition	1.27	1.39	1.60	0.89	1.06	1.7
No impediment to employment	1.29	0.95	1.60	1.15	1.79	1.5
Transportation not feasible or available	0.14	0.16	0.19	0.04	0.07	.1
Does not require VR Services	0.67	0.64	0.69	0.38	0.43	.8
Extended services not available	0.11	0.12	0.15	0.16	0.07	.0
All other reasons	11.13	10.41	10.01	13.97	12.83	9.6
Extended employment	0.06	0.04	0.05	0.04	0.03	.0

Table 6.4: T-Test of the mean difference in reasons for closure for White and minority consumers – 2007 RSA-911 Data

Closure Type or Reason	Mean Difference	t-statistic	p-value	95% Confidence Interval of the Difference	
				Upper	Lower
African Americans	-0.297**	-22.918	0.0000	-0.323	-0.272
American Indian/ Alaska Native	-0.367**	-9.401	0.0000	-0.443	-0.290
Asian	-0.076	-1.521	0.1284	-0.174	0.022
Hawaiian/ Pacific Islander	-0.074	-0.945	0.3448	-0.227	0.079
Non-White Hispanic	-.379**	-6.112	0.000	-.257	-.500

** Statistically significant (p<0.01)

Comparison of 1997 and 2007 closure reasons

Although hypothesis 6 was not totally rejected when tested with 1997 data, it was rejected for 2007. Table 6.5 presents a comparison of 1997 and 2007 proportions of consumers closed for different reasons. There are notable changes between 1997 and 2007. The most obvious difference is that in 1997 the differences in closure reasons were statistically insignificant except for differences between closure reasons for whites and for non-white Hispanics. In other words, there were no differences in closure reasons in 1997 for whites and

for minority consumers except for non-white Hispanics. However, in 2007 the differences were statistically significant for African Americans, American Indians and non-white Hispanics, suggesting that there were differences in closure reasons for whites and for these minority groups. However, there were no differences in closure reasons for whites and for Asians or Hawaiian/Pacific Islanders. Another notable change is that in 2007 smaller proportions of consumers were closed for the reasons “unable to locate or contact” “refused services” and “failure to cooperate” than was the case in 1997.

Table 6.5 Comparison of 1997 and 2007 closure reasons.

Closure Reason	Whites %		Blacks%		American Indian %	
	1997	2007	1997	2007	1997	2007
Unable to locate or contact	20.79	15.68	22.14	19.33	25.97	20.95
Disability too severe	3.78	1.78	2.68	1.54	2.87	1.71
Refused services	32.61	17.49	26.78	14.37	26.41	18.33
Death	1.13	0.65	0.79	0.58	0.87	0.62
Client institutionalized	1.29	0.80	2.49	1.45	2.02	1.48
Transferred to another agency	1.88	1.15	1.61	1.04	1.74	1.76
Failure to cooperate	16.86	11.88	26.34	18.29	19.27	16.04
No disabling condition	2.72	1.27	2.48	1.39	3.20	1.60
No impediment to employment	3.12	1.29	1.89	0.95	3.43	1.60
Transportation unavailable	0.30	0.14	0.36	0.16	0.40	0.19
All other reasons	15.52	11.13	12.44	10.41	13.82	10.01
Closure Reason	Asian & Pacific Islander%		Hawaiian		Non-White Hispanic%	
	1997	2007			2007	1997
Unable to locate or contact	26.44	17.94	24.18		27.4	19.2
Disability too severe or unfavorable medical prognosis	5.00	2.46	2.12		2.7	1.0
Refused services	25.63	14.84	14.13		28.0	12.9
Death	1.02	0.59	0.63		1.0	.5
Client institutionalized	0.89	0.52	0.96		2.0	.9
Transferred to another agency	3.31	1.80	1.09		2.4	1.7
Failure to cooperate	13.43	9.03	9.99		21.6	20.6
No disabling condition	2.46	0.89	1.06		2.4	1.7
No impediment to employment	2.78	1.15	1.79		2.5	1.5
Transportation not available	0.20	0.04	0.07		.2	0.1
All other reasons	18.83	13.97	12.83		9.7	9.6

Discussion and Summary

Several facts stand out in these study findings that relate to the provision of the 1998 amendments to Section 21 of the Act:

1. There are statistically significant access differences between minorities and white consumers. Except for Asian Americans who seem to enjoy slightly better access to VR other minorities have poor access and outcomes;
2. There are statistically significant differences in per capita spending for White and for minority consumers. VR spent less per capita on purchased services for minority consumers than for white consumers. The exception is Asian Americans for whom VR spent more per capita than what spent on white consumers.
3. White consumers access more quality services than minority consumers. They access more of the higher end training such as college/university than do minority consumers.
4. White consumers have higher educational levels, better employment and earnings, and are less dependent on need-based public support than minority consumers both at application and at closure
5. White consumers have more successful closures than do minority consumers except Asian consumers who have the same or slightly better closures than white consumers.
6. A large proportion of consumers are closed for three reasons “failure to cooperate”, “unable to locate” or “refused further services.”
7. Furthermore, in 1997 the differences between Whites and minority consumers in closure reasons was statistically insignificant except for the differences between non-white Hispanics and Whites. In 2007 the differences in closure reasons are statistically significant, indicating that a wider rift in 2007 than recorded in 1997.

8. Overall, minority consumers are in the rehabilitation service delivery system for shorter periods of time than white consumers except Asian consumers who have longer service periods than Whites.
9. Overall, African American and American Indian consumers experience shorter access periods, lower per capita expenditures, proportionately fewer successful closures than Whites and other minority groups.

CONCLUSIONS

The study tested six hypotheses:

1. *After the provisions of the 1998 amendments to Section 21 of the Act took effect there was no difference in waiting and intervention access period for Whites and for ethnic minority consumers.*

The Study found significant differences between minority and white consumers waiting and service periods. Whereas African American and American Indian consumers waited for shorter periods of time for determination of eligibility and for their IPE, they were served for significantly shorter periods. For Asian and Hawaiian consumers the changes in access and outcomes between 1997 and 2007 seem to have worked in their favor. Asian consumers accessed VR services for longer time periods. Hypotheses 1 is rejected – especially for African American and American Indian consumers.

2. *After the provisions of the 1998 amendments to Section 21 of the Act took effect there was no difference in per capita expenditures on services rendered to Whites and to ethnic minority consumers.*

The expenditure patterns depicted by the 1997 data were also present in the 2007 data. VR spent more per capita on white consumers than on: African Americans by \$625.67; American Indians by \$825.79; non-white Hispanics by \$396.34, and less for Hawaiian consumers than for Whites by \$141.12. However, VR spent more on Asian consumers than on white consumers by \$516.26. These results suggest that the expenditure patterns did not change after the provisions of the 1998 amendments to Section 21 of the Act. Thus, hypothesis 2 is rejected.

3. *After the provisions of 1998 amendments to Section 21 of the Act took effect there was no difference in quality of services rendered to Whites and to ethnic minority consumers.*

African American and American Indian access to higher quality services seems worse in 2007 than in 1997. They received proportionately less of the high-end training than Whites, including: college/university training, vocational training, and disability argumentative skills training. They also received proportionately less diagnosis and treatment, job search, on the job supports, rehabilitation technology and technical assistance. However, they receive proportionately more transportation, maintenance, information and referral. Hypothesis 3 is rejected.

4. *After the provisions of 1998 amendments to Section 21 of the Act took effect there was no difference in rehabilitation service outcomes of Whites and those of ethnic minority consumers.*

This hypothesis was tested using three outcome measures: employment and earnings, education and health insurance, and dependence on public support. In all these measures, minorities fared worse than Whites – except Asian Americans who seem to be at par or better off than Whites. Hypothesis 4 is rejected.

5. *After the provisions of 1998 amendments to Section 21 of the Act took effect there was no difference in closure types of Whites and those of ethnic minority consumers.*

Analysis of the 1997 data indicates that 27% - 37% of consumers were closed as rehabilitated. However, a larger proportion of minority consumers than of white consumers were closed as applicants, without having been determined as eligible for services or achieving employment outcomes. Closures at the application status were – 19.53% Whites, 18.69% Asians/Pacific Islanders, 23.68% African Americans, 27.26% American Indians, 25.5% non-white Hispanic. The 2007 data also indicates that a larger proportion of minority consumers were closed as applicants. The 2007 closures at the application status were – 14.63% Whites, 11.36% Asian, 18.17% African American, 17.22% American Indian, 13.96% Hawaiian, and 18.2% non-white Hispanic. The 2007 data indicate that Asian closure types were similar those of Whites and that their employment outcomes were slightly better than those of white consumers. Statistical tests indicate that differences in closure types for White and minority consumers are statistically significant. Furthermore, the multivariate analysis of likelihood of successful closures indicated that minority status has a negative and statistically significant effect such likelihood. Given these findings, hypothesis 5 is rejected.

6. *After the provisions of 1998 amendments to Section 21 of the Act took effect there was no difference in reasons for case closures for Whites and for ethnic minority consumers.*

The 2007 data indicate that 25% - 36% of all consumers were closed with an employment outcome. The remaining consumers closed without employment outcomes were closed for reasons similar to those indicated by the 1997 data: “failure to cooperate”, (9.03 to 20.6%), “refused further services”, (12.9 to 20.95%), and “unable to locate”, (15.68 to 24.18%). “All other reasons” for closures ranged from 9.6 to 13.97%. Proportionately more minority consumers were closed for these reasons. A comparison across minorities indicates that a higher percentage of Asian consumers were closed with an employment outcome. The groups with the smallest proportion of employment outcomes at closure were American Indian and African American. Hypothesis 6 is rejected.

Given these findings, the study concludes that even after the provisions of the 1998 amendments to section 21 of the Act took effect, there are still differences in access and outcomes. Although the gaps are smaller in access to some services other gaps seem to have widened. The goals of section 21 have not yet been achieved. This is especially true for American Indians and African American consumers.

Recommendations

The study recommends that follow-up studies be conducted to obtain more specific data and information that will guide VR toward effective approaches for improving access and outcomes for minority consumers. Such studies should identify where and by what means quality outcomes are being achieved. The studies would find answers to the following questions:

1. What best practices are being employed to achieve quality outcomes?
2. What agencies have the highest number of quality outcomes?
3. Do VR agencies have policies and procedures that lead to quality outcomes for minority group members?
4. Are there differences between and within States that lead to better outcomes?
5. Are there particular characteristics of consumers who achieve better outcomes?
6. Are there particular characteristics of counselors who achieve better outcomes?
7. What interventions can be employed to improve the quality of outcomes for minority consumers?
8. Have the findings of the IRI on diversity been implemented by VR agencies?