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A BENEFIT–COST ANALYSIS OF A SUPPORTED EMPLOYMENT MODEL FOR PERSONS WITH PSYCHIATRIC DISABILITIES

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ABSTRACT

After a review of the relevant literature, a methodology for conducting a benefit–cost analysis of an innovative supported employment intervention was developed. Several hypotheses were formulated and tested. The results indicated that, though the program did not quite achieve, it did approach cost efficiency with a ratio of almost .90 of benefits to costs. Program participants experienced significant monetary and nonmonetary benefits including a reduction in the use of several mental health services, increased wages and time in integrated employment settings. Reasons for not achieving cost benefit included the small number of subjects, system costs incurred due to increased advocacy efforts by staff, inability to quantify the intangible benefits that accrued to subjects, and the limited time frame of program operation. This analysis needs to be replicated with larger programs over a longer period of time before any definitive conclusions about the benefits of the supported employment model can be determined. The methodology presented has value for program evaluators, policymakers, and planners of supported employment services for persons with psychiatric disabilities.

INTRODUCTION

Supported employment programs were developed in response to the poor vocational outcomes of people with severe disabilities (Anthony & Blanch, 1987). Most vocational rehabilitation programs emphasized the "train and place" approach to prepare clients for the world of competitive employment. Clients often spent years

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involved in these programs, "training" for employment, but with very limited numbers transitioning to competitive employment.

In contrast, supported employment (SE) approaches seek to place participants into a job immediately, and then train them specifically for that job. Supported employment is characterized by a goal of paid work in integrated job settings with whatever ongoing support is necessary to maintain employment over time (Will, 1984). Most programs include job placement, job site training, ongoing monitoring, and follow-up. Job placement occurs through some variation of individual competitive job placement, work crews, or enclaves (Wehman & Kregel, 1985; Botterbusch, 1989). Supported employment generally has several phases, including: determining job preferences and competencies, developing a job that closely matches the participant's competencies and preferences, providing on-the-job coaching in the specific tasks and skills required for the job, and finally fading the job coaching (Danley & Mellen, 1987; Wehman & Kregel, 1985; Wehman, Kregel & Shafer, 1989). Supported employment was developed initially to address the needs of people with mental retardation (Rhodes & Valenta, 1985; Revell, Wehman, & Arnold, 1984). Although labor-intensive during the first phase, a number of studies have found supported employment to be a cost-beneficial approach producing better vocational outcomes for people with severe disabilities (Boles, Bellamy, Horner, & Mank, 1984; McCaughrin, Ellis, Rusch, & Heal, 1993; Noble & Conley, 1986; Noble & Conley, 1987; Rhodes, Ramsing, & Valenta, 1986; Wehman, 1981). These studies, however, have not been unequivocal (Thornton, 1992).

Despite the recent proliferation of supported employment programs for persons with psychiatric disability, there have been few studies examining their benefits relative to their costs. Such research is important because the services, structure and outcomes of supported employment programs for individuals with psychiatric disability differ from those for people with mental retardation, on whom the majority of studies thus far have been conducted.

While supported employment is a relatively new service, several articles discussing cost–benefit methodologies and examining the cost–benefit of supported employment interventions do exist in literature (Conley & Noble, 1990; Johnson, Lewis, & Bruininks, 1993; Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1992; Noble, Conley, Banerjee, & Goodman, 1991). Though an in-depth discussion of the type of analytical frameworks for examining costs and benefits of programs for persons with disability is clearly beyond the scope of this paper, some of the methodological dilemmas that continue to plague cost–benefit studies should be mentioned. Johnson and his colleagues (1993) performed an extensive review of cost–benefit literature on supported employment programs. They concluded that ultimately, cost–benefit studies in supported employment will prove most useful when cross-agency and cross-program comparisons can be made, thereby allowing a cumulative body of knowledge regarding cost–benefit studies to develop. However, according to Johnson et al. (1993) evaluators have yet to reach a consensus about the goals and outcomes of supported employment that would facilitate such comparisons. Also needed are improved conceptual frameworks to guide cost–benefit studies, and standard measures to describe program participants, and "common accounting frameworks" for reporting program costs. Studies of the cost effectiveness of supported employment vis-a-vis other vocational interventions must also need to be undertaken (Johnson et al., 1993).

While examining effectiveness may mean different things to different constituencies, it always involves measuring whether the goals and outcomes of a social program have been achieved (Johnson et al., 1993). An efficiency evaluation, however, involves determining whether a program is worth its cost and includes: defining the program and its alternatives, determining the analytic perspective, listing and then valuing program effects and costs. An efficiency evaluation is also referred to as a cost effectiveness or cost/benefit analysis.

According to Thornton (1984; 1992), there are three important issues to consider when attempting to replicate benefit–cost studies: the population served, the program operations, and the evaluation methods used. This study reports on an innovative supported employment project conducted on a university campus and describes both the population served and the evaluation methods in detail. The project was a 3-year study, funded by the National Institute on Disability and Rehabilitation Research, and was designed to serve young adults with severe psychiatric disabilities.

METHOD

Subjects

Twenty participants were enrolled in the intervention; enrollment was staggered and occurred over a period of 12 months. One subject refused to provide data and subsequently dropped out of the study, leaving an effective sample of 19 participants. Subjects were selected for the project if they:

- Had experienced a severe disability due to mental illness, which resulted in impaired role functioning.
- Were between 18 and 55 years of age.
- Were interested in working in a university setting at least 20 hours per week.

- Had symptoms from their mental illness that were managed by whatever supports or skills were necessary.
- Had adequate and stable housing.

The subject group was predominately white (95%), male (74%), never married (79%), with an educational level beyond high school (89%). The mean age was 36 years. Most subjects were living in an unsupervised residence (85%) at the time of entrance into the study. A large percentage of the subjects were diagnosed as having a major affective or bipolar disorder (53%), and 37% of the subjects were diagnosed as having schizophrenia. Subjects had a substantial history of psychiatric hospitalizations (an average of 22 months per lifetime), and the majority were taking psychotropic medication (84%). Approximately 11% of the sample was reported to have a current substance abuse problem; 37% of the sample was reported to have had some contact with the criminal justice system.

All subjects had some competitive, supported or transitional employment experience. The mean number of months employed in the 5 years prior to intake was 12.42 of full-time employment and 22.42 of part-time employment. Six subjects were enrolled in a supported, transitional or competitive job when they entered the study (individuals employed in these capacities were referred to the project because they needed support services to maintain their status or to obtain more suitable employment). Several subjects were referred to the project by other psychosocial and vocational rehabilitation programs.

Intervention

The program model for this study, named the "Choose-Get-Keep Approach," was designed to incorporate the principles and practices of psychiatric rehabilitation and consists of activities that help participants to select, secure and sustain employment in environments of their choice (see Table 1 for a list of model components; MacDonald-Wilson, Mancuso, Danley, & Anthony, 1989).

Three sets of program activities, *Choosing*, *Getting* and *Keeping*, form the program structure and parallel the supported employment components described by others as preemployment, placement, and training/follow-along (Moon, Goodall, Barcus, & Brooke, 1986). In this model, the terms *Choose*, *Get* and *Keep* were deliberately selected to focus the process on the participants' activities, rather than on the practitioners' activities.

The supported employment activities needed to help people with psychiatric disability differ from those needed for other disability groups. We have found, for example, that persons with psychiatric disabilities may take considerably longer in the "Choosing" phase than persons with other disabilities and that the timing of intensive support may depart from the prevailing job coaching model of intense up-front support, followed by a fading out of support over time (Barcus, Brooke, Inge, Moon, & Goodall, 1987; Moon, Goodall, Marcus, & Brooke, 1986; Botterbusch, 1989). Further, issues related to stigma and disclosure of disability frequently dictate that supported employment interventions be provided away from the workplace and also mean that participants do not want program staff to make themselves known to an employer. One hallmark of this study was the emphasis on practitioner flexibility and responsiveness to the episodic and often unpredictable nature of psychiatric disability. The program operations and the supported employment model used are described in greater detail elsewhere (Danley, 1992; MacDonald-Wilson et al., 1989).

Procedures

The methodology developed for this project makes use of generally accepted principles of benefit–cost analysis. The present analyses are unique, however, in that they are based largely on actual data collected on 19 subjects over a period of 2 years. Data were collected retrospectively on subjects for the year prior to enrollment in the supported employment project and prospectively for at least 1 year after enrollment. Instruments designed specifically for this study were used to gather information via self-report by subjects in quarterly face-to-face interviews with trained project staff. Data collection instruments carefully set out each type of day, residential and treatment service we anticipated was available to any participant. The interviewer guided each subject in a step-by-step manner through each service category and reviewed and recorded the quantity of each service used. The acquisition of pre- and postdata

TABLE 1
COMPONENTS OF THE CHOOSE-GET-KEEP APPROACH TO SUPPORTED EMPLOYMENT

Choosing Activities	Getting Activities	Keeping Activities
• Employment goal setting	• Placement planning	• Skill development
• Job development	• Direct placement	• Service coordination
• Decision-making	• Placement support	• Employer consultation

allowed us to describe the actual experience of the 19 subjects in the study and to compute costs and benefits based on that experience.

To carry out the analysis we used the five-step approach developed by Sav (1986) for conducting benefit–cost analyses of transitional employment programs. However, other investigators, Rhodes and his colleagues (1985; 1986), Noble et al. (1991) and Johnson et al. (1993), describe similar methodologies.

Define the Program and Alternatives. The population served and intended effects of the model are described above. The next task was to postulate the likely alternative services to the supported employment program. That is to say, if this program did not exist, what would be the likely "substitute programs" utilized by subjects in the study? Rhodes and his colleagues (1986) suggest that "The full range of day services . . . be considered when estimating benefits and costs within a local system." This approach allows researchers to understand the effect of the program on the pattern of service use within a given system. Since actual utilization was tracked across a broad range of services prior to and after enrollment in the program, we decided not to make any assumptions about likely alternative services, but simply to consider all services used in our calculations.

Specify Evaluation Criteria. Generally three criteria are considered when evaluating a social program. Efficiency or cost effectiveness, equity (i.e., who benefits) and intangibles (i.e., qualitative benefits). Efficiency refers to the program's effect on the costs and benefits that accrue to society in general and answers the question: "Do the benefits that result from the existence of the program exceed the costs associated with it?"

No less important is the question of equity, or who is helped by the program and who is hurt by it. In an analysis similar to that used by McCaughrin and her colleagues (1993), judgments concerning equity were arrived at by considering net costs and net benefits from three perspectives: the perspective of program participants; the perspective of nonparticipants (that is, all others but excluding the participant, sometimes referred to as the "taxpayer"); and finally, from a social perspective, or the combined perspective of tax payer and nontaxpayer. Using this schema, what may be considered a benefit from one perspective is a cost from another perspective. For example, a reduction in SSI benefits is clearly a cost to the participant and a benefit to the nonparticipant. It is, however, neither a benefit nor a cost from a social perspective since it represents simply a transfer of monies. A reduction in SSI payments would be a social benefit only if it were to reduce administrative costs associated with the SSI program (e.g., eliminate some fixed cost).

Finally, intangibles are benefits that are not directly quantifiable. Reduced psychiatric symptoms and increased levels of work integration are examples of intangible benefits. Sav (1989) noted that intangibles "cannot be valued in monetary terms . . . at least not with available data and empirical techniques . . . yet such intangibles are important . . . " (p. 47). This study considers several intangible benefits as tertiary evaluation criteria.

Identify Specific Benefits and Costs. All benefits and costs measured are contained in Tables 2 and 3. Five hypotheses were generated regarding the effect of the supported employment intervention on these benefits and costs. They were as follows:

TABLE 2
PREINTERVENTION AND POSTINTERVENTION EARNINGS AND BENEFITS

Income Source	Preintervention Income (n = 19)	Postintervention Income (n = 19)	Net Change (Post-Pre-Income)
Earned income and fringe benefits	$51,519	$86,600	
SSI	$15,171	$13,446	
SSDI	$75,591	$72,217	
General relief	$7,214	$1,368	
AFDC	$0	$0	
Veterans benefits	$18,344	$18,006	
Food subsidies	$22,688	$26,968	
Rent subsidies	$78,166	$68,816	
Other cash benefits	$4,112	$2,735	
			Net change
Total earnings	$51,519	$86,600	$35,081
Total benefits	$221,286	$203,556	($17,730)
Total income	$272,805	$290,156	$17,351

- Net participant wages and benefits will rise.
- Use of other mental health support and treatment services will decline.
- Transfer payments to participants will decline and participant tax liability will increase leading to a reduction in public dependency.
- The cost of the program will be offset by benefits reaped in hypotheses 1, 2 and 3.
- Several intangible benefits will be produced.

Estimate Benefits and Costs. Several variables collected during the study were used to compute benefits and costs for the year prior to and after enrollment in the program.

Participant wages and benefits. Information regarding total wages earned by participants was collected retrospectively at intake and quarterly thereafter. The monetary value of fringe benefits (health insurance, tuition, Social Security, sick leave, vacation time, etc.) was estimated at 15% of each participant's gross income. This figure is recommended by the U.S. Department of Labor (1980). Net wages and benefits were computed by calculating the difference between total wages and benefits for the year prior to and after enrollment.

Participant tax liability. Because of the difficulty of obtaining this data directly, total tax liability (all federal, state and local) paid by participants in the program was estimated using an effective tax rate of 23% of gross income. This is an appropriate figure for low wage earners (Pechman & Okner, 1974).

Participant use of alternative services. Reduced use of alternative service programs represents a cost savings to the system. Pre- and postintervention service utilization data were collected. Individual service amounts were applied to unit cost figures derived from the reimbursement rate-setting guidelines of the Massachusetts Department of Mental Health. Unit costs represent 1990 cost estimates for providing services in the Boston metropolitan area. Services and their unit costs are contained in Table 3. Net changes in service use were computed by subtracting preintervention from postintervention service use.

Public dependency. The actual dollar value of benefits received by participants was calculated. Participants reported all transfer payments received including income support (SSI, SSDI, etc.), in-kind benefits (rent subsidies, food stamps, etc.), and private contributions (parental support, Workers's Compensation, etc.; see Table 2). We assumed that changes in public transfer payments would not significantly reduce any overhead or administrative costs associated with the transfer program.

TABLE 3
PREINTERVENTION AND POSTINTERVENTION USE AND SERVICE COSTS

Service	Service Unit	Unit Cost	Preintervention Service Use (n = 19)	Postintervention Service Use (n = 19)	Preintervention Service Cost	Postintervention Service Cost
Psychiatric hospitalization	Day	$343.00	123	56	$42,189.00	$19,208.00
Vocational rehabilitation	Hour	$10.00	9958	$990.00	$580.00	
Career development	Hour	$10.00	400	$400.00	$0.00	
Work adjustment training	Hour	$10.00	1031	881	$10,310.00	$8,810.00
Job placement	Hour	$10.00	80	$80.00	$0.00	
Supported work	Day	$53.39	040	$0.00	$2,135.60	
Supported residential	Day	$70.54	628	104	$44,299.12	$7,362.61
Respite care	Day	$81.00	50	$405.00	$0.00	
Supported education	Hour	$22.92	1	183	$22.92	$4,194.36
Social/living skills instruction	Hour	$8.45	0	6	$0.00	$50.70
Social/recreational activities	Hour	$9.56	43	1632	$411.08	$15,601.92
Case management	Hour	$14.42	9942	$1,427.58	$605.64	
Transportation	Day	$10.58	221	324	$2,338.18	$3,427.00
Advocacy & protection	Hour	$30.00	1777	$510.00	$2,310.00	
Therapy/medication evaluation	Hour	$67.53	1358	816	$91,705.74	$55,104.48
Day treatment	Day	$68.31	17566	$11,954.25	$4,508.46	
Crisis services	Hour	$121.43	29	3	$3,521.47	$364.29
Medical/dental	Visit	$46.00	32	54	$1,472.00	$2,484.00
Totals			$3,909.00	$4,342.29	$212,036.34	$126,747.06
Net change				$433.29	($85,289.28)	
Per client totals		$205.74	$228.54	$11,159.81	$6,670.90	
Per client net change			$22.80			($4,488.91)

Program cost. Job coaches logged all direct service time for each client contact. Direct service time was defined as any time associated with an individual participant contact, including travel, documentation and actual contact time. Job coaches spent about 85% of their time providing direct service to participants and about 15% of their time in nondirect service activities (nondirect service included activities not associated with specific individuals, such as identifying job openings and meeting with prospective employers). Clients received an average of 9.63 hours of direct service per month.

The calculation of personnel costs was based on the costs of 3.15 FTE job coaches at an average salary of $25,039, .5 FTE secretarial support at $18,000, and .25 FTE program manager at $35,000. Fringe benefits for personnel were calculated at 25% of gross wages; the 25% figure is used because this was the actual rate charged by the University within which the program was housed. Overhead cost was calculated at 25% of total personnel costs. (The use of 3.15 FTE job coaches, rather than 3.5 or 3.25, was simply a function of how grant monies were allocated.)

Total direct and nondirect service costs were added to administrative and overhead costs. This figure of $142,566, was divided by the total number of FTE's (3.9) multiplied by the number of weeks of program operation for 1 year (47), multiplied by the number of hours per week (35; the number of hours per week job coaches actually engaged in work, that is, 40 hours less their lunch hour) to arrive at an average monthly program cost per client of $594. This translates into a cost per direct service hour of $61.68. A summary of total program cost broken-out by direct and indirect costs is presented in Table 4.

Start-up costs such as purchase of equipment and other one-time expenses were not included in the estimate of program cost because such costs are usually amortized over several years and the current analysis takes into account only 1 year of program operation.

Determine Present and Adjusted Value of Benefits and Costs. Benefits received and costs incurred in different years are often not directly comparable because of inflation. The fact that present dollars are more valuable than future dollars must also be taken into account. All monies used in this analysis are expressed in terms of 1990 dollars. Since 1990 unit costs were applied to the service utilization data, it was not necessary to discount savings associated with alternative program use. Likewise, since 1990 rates were applied to staff time including administration and overhead, program costs did not need adjustment. Participant income (wages and fringe benefits) and transfers (SSI, parental support, etc.) received in earlier years, however, had to be adjusted to their 1990 value. This was accomplished by adding the real discount rate (4%) to the rate of inflation during the relevant period in the Boston metropolitan area (5%). The 9% figure was then used to adjust salaries earned by participants upward. The use of this 9% nominal discount rate is in the range of rates, 3%–10%, used in similar studies (Hill, Banks, Handrich, Wehman, Hill, & Shafer, 1987). To check the sensitivity of this rate, the 3% figure was used with negligible impact on the results.

RESULTS

Results are presented in light of each of the five hypotheses developed about the benefits and costs of the supported employment intervention.

Our first hypothesis was that the net wage of participants would rise. We found that the average earned income per client increased from $2,712 in the year prior to program enrollment to $4,558 in the year after program enrollment. This represents a net increase of $1,846 per client. The increase in earned income reflects the increased competitive employment activity of program participants after enrolling in the supported employment intervention. (As suggested by Noble & Conley (1987), we did not use postprogram income alone to compute costs and benefits as have earlier studies, but rather subtracted preprogram earnings from postprogram earnings and used the result in further assessments of costs and benefits.) Table 2 contains the net earnings for all subjects, before ($51,519) and after ($86,600) the intervention.

TABLE 4
SUMMARY OF AVERAGE ANNUAL PROGRAM COST FOR 3 YEARS OF PROGRAM

Program Cost Component	Total Average Annual Cost	Percent of Total Cost	Portion of Hourly Rate
Personnel:			
Direct Service:	$81,144	57%	$12.70
Nondirect Service:	$32,865	23%	$5.12
Overhead:	$28,557	20%	$4.45
Totals:	$142,566	100%	$22.27

Secondly, we hypothesized that the use of other mental health services would decline. The total units of service used by program participants increased from 206 per client in the year prior to enrollment to 229 in the year after enrollment. The total cost of service use, however, declined from $11,160 to $6,671 per client. This represents a savings to the system of $4,489 per client. Table 3 contains the total cost of services for all subjects before ($212,036) and after ($126,747) the intervention.

The bulk of this savings was achieved by a reduction in the use of more costly services, such as, inpatient care, crisis, therapy and day treatment services. The total savings from a reduction in the use of these services was $3,693 per client. Another source of savings was a reduction in the use of supported residential, respite and case management services. Participants obtained higher levels of independent living after enrollment in the project, reducing their use of residential services and saving $1,944 per client.

As expected, the use of other day and vocational services such as day treatment, vocational rehabilitation, work adjustment training, job placement and career development were supplanted by the supported employment intervention. This savings was offset, however, by one participant who received a substantial amount of supported employment services from another provider.

The use of several other services, such as supported education, transportation, social/recreational activities, advocacy and protection, and medical/dental care increased. Two participants decided to seek additional education before pursuing a vocational goal and were referred to a supported education program. The cost associated with the increased use of these services was $1,224 per client. Overall, however, costs associated with the use of other mental health services were substantially reduced. Table 3 summarizes all service use and related costs for preintervention and postintervention periods.

Our third hypothesis was that transfer payments to participants would decline. The total transfer payments received by program participants did decline from an average of $11,647 to $10,713 per client, representing a savings of $933 per client. SSI, SSDI, General Relief, rent subsidies and other cash benefits all declined. Food subsidies increased while Veterans benefits remained roughly unchanged.

As would be expected, SSI, SSDI and General Relief declined more sharply for those participants whose earnings from work increased. Reductions in SSI were offset somewhat by program staff's efforts to help participants not previously receiving SSI to meet eligibility requirements.

The largest portion of rent subsidies was provided by families. As participants moved into more independent living environments, rent subsidies declined. At the same time it appeared that participants became more dependent on food stamps and family contributions to meet food expenses. In sum, there was a slight reduction in public transfer payments to program participants 1 year postenrollment. It is expected that transfers would continue to decline over time and eventually stabilize. A summary of these results is contained in Table 2.

We further hypothesized that the costs of the supported employment program would be offset by benefits it produced. The average annual per client cost associated with the program was $7,128. The cumulative benefits from the effects hypothesized above did not countervail program costs. Total benefits were $6,335 per client, leaving a net cost of $793 per client.

Lastly, we hypothesized that several intangible benefits would be the result of participation in the program. To address that question we examined vocational activity, job satisfaction, satisfaction with the supported employment program, work site integration, satisfaction with social supports, and symptomatology.

The number of participants employed and the number of hours worked increased dramatically over the first three quarters of participation and then decreased slightly in the fourth quarter and at the end of the study. Increases in the number of subjects employed were again noted at a follow-up conducted 2 years after the study's end. A repeated measures' analysis of variance with time as the repeated measure was performed on hours worked per week, which showed a significant increase over time to the study's end ($F(5,75) = 5.41$, $p = .0003$).

Job satisfaction was measured 3–5 months after employment on 13 subjects. Participant scores were compared with normative data provided by Weiss, Dawis, England, and Lofquist (1977). Participants ranked in the 40th percentile when compared to a group of nondisabled, unskilled workers and in the 20th percentile when compared to disabled workers. Project participants tended to be younger, more educated, less experienced, and employed in jobs requiring less skill. This "underemployment" may have led to lower levels of job satisfaction.

Satisfaction with the project was assessed using a self-report questionnaire developed specifically for the study to measure the accessibility and availability of staff, the amount of services and support they received, and whether the program met participants' expectations. The vast majority of subjects were very satisfied with the supported employment intervention overall. On specific questions regarding the accessibility and availability of assistance from staff, 86.7% of the participants stated they were very satisfied; 60% were very satisfied with speed of staff response to their problems; 87% were very satisfied with the effectiveness of staff in helping them address supported employment problems. The most notable area of dissatisfaction was related to the length of time it took to obtain employment: only 40% of participants responding felt very satisfied in this area. All of the

participants stated they would recommend the program to a friend in need of supported employment services.

Work site integration was also examined as an intangible benefit. Of the 10 subjects who were employed and who could be rated on work integration, 7 were judged to work in highly integrated settings, scoring between 12 and 18 out of a possible 18 points on a Work Integration Scale developed for this study. Two participants were judged to work in moderately integrated settings, and one worked in a moderately unintegrated setting.

Participants experienced no changes in psychiatric symptoms, satisfaction with social supports, or frequency of social contact over the course of the project. Subjects entered the study relatively asymptomatic, as measured by the Brief Psychiatric Rating Scale (Overall & Gorham, 1962), and they remained so during the project (paired $t(18) = .12$, $p = .90$). Subjects began the project moderately dissatisfied with their social supports, and this did not change over time (paired $t(18) = .29$, $p = .77$).

The final step in the benefit–cost analysis is to formally implement the evaluation criteria, that is, efficiency, equity and intangibles. Those results are presented in Table 5.

Efficiency

The benefit–cost ratio, that is the ratio of total program benefits divided by total program costs, is .89. A benefit–cost ratio of less than one indicates a lack of cost efficiency. Therefore, from an efficiency point of view, the program represents a net cost to society. This cost is $793 per client for 1 year.

Reasons for this lack of cost efficiency may have been the small size of the program, the low staff-to-participant ratio, and the limited time frame of the study. The small size of the program prevented economies of scale from being achieved. This seems particularly evident from analyzing administration and overhead costs, which accounted for about 35% of total program costs. It seems likely that the number of clients served could be increased without proportionally raising administration and overhead costs. An increase in the marginal efficiency of the program would lower the average cost per client. The low staff to participant ratio, approximately 1 to 6, could possibly be increased as well without a detrimental impact on outcomes.

Equity

Table 5 lists costs and benefits from three differing perspectives — society, the participant and the nonparticipant. Since the social perspective includes the perspectives of all members of society, the benefit–cost ratio of .89 implies that there is a net cost to society.

Equity can be evaluated by comparing the costs and benefits of participants versus those of nonparticipants. From Table 5, participants benefited by an average of $488 each. The increase in participant income was greater than the combined cost to the participant of an increased tax liability and a loss of public benefits. Both of these latter costs to the participant represent a benefit to the nonparticipant. The nonparticipant here is thought of as the taxpayer whose burden of supporting income transfer programs and other public programs has decreased. These benefits to nonparticipants, however, did not offset the cost of the program. Nonparticipants experienced a net yearly cost of $1,282 for each participant in the program.

Intangibles

Before arriving at any final judgments regarding the value of the intervention under consideration, qualitative

TABLE 5
BENEFIT AND COSTS OF SUPPORTED EMPLOYMENT PROJECT IN 1990 DOLLARS PER PROGRAM PARTICIPANT

Component	Social	Participant	Non-Participant
Benefits:			
Wages and fringe benefits (post-program output)	$1,846	$1,846	$0
Taxes paid by participants		($425)	$425
Reduced use of alternative programs	$4,489		$4,489
Reduction in public dependency (transfer payment reduction)		($933)	$933
Total Benefits	$6,335	$488	$5,847
Costs:			
Direct and indirect program cost	($7,128)		($7,128)
Total Costs	($7,128)	($7,128)	
Net Benefits	($793)	$488	($1,282)
Benefit–Cost Ratio	0.89		

benefits must somehow be weighed against costs (Thornton, 1992). This is necessarily a subjective process about which experts may disagree. A benefit–cost analysis of any public program, however, would be inadequate if intangible benefits were not considered.

We believe several intangible benefits accrued to program participants. Perhaps the most important ones resulted from the significant increase in employment activity and the opportunity to participate in a program set in an attractive and nonstigmatizing setting. Over the course of the study many participants became competitively employed in integrated work settings, increasing total hours worked and earnings.

DISCUSSION

Participants of this innovative supported employment program were able to increase their employment earnings from the year prior to the study to the year after. In addition, the use of expensive mental health services declined substantially during the study period, suggesting that supported employment programs can have a salutary impact upon the mental health status of its participants and the services they use. In particular, it appears that the use of traditional mental health services such as inpatient hospitalizations, psychotherapy, day treatment, and crisis services declined during the study period. We attribute that decline to the supplanting of these services by the support offered through the program under study. Staff of the program were very accessible to participants and tended to form strong and empathic relationships with them. Therefore, clients sought staff out to discuss and obtain assistance with problems and issues beyond the vocational, thereby diffusing crisis situations that potentially could have ended in hospitalization. This finding is similar to findings of a previous Center study (Unger, Anthony, Sciarappa, & Rogers, 1991). That is, participation in a career development program had the effect of rather dramatically reducing hospitalization rates. Job coaches in this study also assumed several case management functions, apparently allowing participants to diminish their use of this service. Undoubtedly, day treatment declined simply because it was replaced by the supported employment intervention and employment.

Social/recreational services increased. We suspect that increase is due to our strong efforts to help clients strengthen their social support networks. Perhaps one of the learnings from this demonstration study is that for persons with severe psychiatric disabilities, social and emotional support for pursuing employment is critical. Success on the job is not an isolated phenomenon but is integrally related to social, emotional, familial and general well-being. Supported employment programs undoubtedly cannot confine their interventions to vocational issues but must be cognizant of the client's overall functioning.

Several intangible benefits accrued to the participants, such as increased time spent in work; employment in settings, which were on the whole highly integrated; decreased time spent in hospitals; and a high degree of satisfaction with the supported employment program. Several caveats are in order, however, before drawing definitive conclusions about this cost–benefit study. First, design of the project did not permit a controlled experimental study of benefits and costs as have been conducted of other mental health services (Weisbrod, 1983). Without the use of a control group one cannot entirely rule out the possibility that other events are responsible for the increased employment and decreased service use during the study period. During the study's time frame, however, the annual local unemployment rate was increasing steadily (from 3.0% to 5.1%), making improvements in the local economy an unlikely rival hypothesis for the positive change we observed (U.S. Department of Commerce, 1992). In addition, we conducted a 2- and a 3-year follow-up of the study participants and found that over 55% were employed full or part-time (Danley, Rogers, MacDonald-Wilson, & Anthony, 1994), whereas only 33% were employed at the study's end. (Most participants continued to receive supported employment services after the study ended). These findings would suggest that changes in the employment rates of the participants were not transient or short-lived.

Another limitation of the study relates to the small sample size. Further, though the data were collected and analyzed in a very systematic and careful manner, we did rely upon the self-report of participants regarding their use of mental health services and on some retrospective data collection. It could also be argued that these subjects are somewhat higher functioning than subjects served in other studies of this population. However, participants in this study have diagnoses of severe psychiatric disability, and the vast majority have long hospitalization histories and were taking psychotropic medications. Still, their educational attainment appears higher and their employment histories somewhat more substantial than subjects in studies involving the general population of persons with psychiatric disabilities (e.g., Mulkern & Manderscheid, 1989). These differences limit the generalizability of the findings of the study.

This benefit–cost analysis of an innovative supported employment program for persons with severe psychiatric disabilities was unable to reach cost efficiency using the methodology recommended by Sav (1986) for determining costs and benefits of transitional employment programs. These findings are congruent with those of Noble (1991), and McCaughrin and Rusch (1990), who found that supported employment programs did not achieve cost efficiency. Our average monthly supported employment

program cost was calculated at $594 per client. This is within the margins of a study by Noble and Conley (1986) who found the average monthly cost per client for several vocational program models to range from $179 to $719 (adjusted to 1990 dollars). In contrast, other authors have found that supported employment programs are cost efficient (e.g., McCaughrin et al., 1993). As Weisbrod (1983) asserts, cost–benefit studies are extremely complex and can be more art than science. Clearly, more research is needed to determine the benefits of supported employment services. This is particularly true because of the dearth of studies conducted on persons with psychiatric disability. For example, a controlled study would permit more definitive testing of our finding that a supported employment program such as this can decrease the use of costly mental health services while simultaneously increasing employment rates. A study conducted over a longer period of time would have the added benefit of testing when or if there is a cross-over to cost efficiency that could not be examined in the rather short time frame of the study. Despite our narrow inability to reach a more favorable ratio of benefits to costs, numerous positive results were noted.

Our projections suggested that were the program able to operate for several more years with a decreased staff-to-participant ratio, its benefits would outweigh costs. Thornton (1992), for example, cites evidence that the cost of a supported employment program can vary by 25% from the demonstration phase to the ongoing phase, with the demonstration phase being more costly. McCaughrin and her colleagues (1993) also found that the net benefits of supported employment programs for persons with mental retardation increased during their 5-year study and that while net benefits were not apparent for severely disabled subjects in the first year of program operation, they were demonstrated by the fifth year. Our intervention needs to be replicated with a larger group of subjects and over a longer time frame before definitive statements can be made about optimal program size, staff-to-participant ratios, or time needed to reach more favorable cost to benefit ratios.

Though the results did not quite reach cost efficiency, the program served society's values of promoting self-sufficiency and preference for work, in a manner that was appealing and nonstigmatizing to the participants because it was held on a university campus. The methodology presented for approaching cost–benefit analysis of supported employment programs should be useful to program planners and evaluators wishing to undertake such study.

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