

Integrating Vocational Services on Case Management Teams: Outcomes from a Research Demonstration Project

Carol T. Mowbray,^{1,4} Deborah Bybee,² and Mary E. Collins³

Recent innovations to improve employment rates among persons with psychiatric disabilities include “hybrid case management/employment services.” Project WINS was a research/demonstration project which integrated specialized vocational services into case management teams. In this report, client outcomes of WINS involvement are evaluated, using a quasiexperimental, longitudinal design. On almost all the work-related variables, participants in the immediate and delayed treatment conditions displayed better outcomes than those in the control condition, as did individuals receiving moderate or substantial service versus no/minimal services. To address possible selection bias due to the quasiexperimental nature of the design, further analyses used baseline differences across conditions and participation levels as covariates. Results of multivariate analyses showed some anomalous findings regarding significant positive effects for the delayed, but not the immediate treatment condition versus the no-treatment control group. However, in similar analyses involving participation level as the independent variable, a moderate or substantial amount of service increased the odds of working by almost five times and also positively affected three other work-related variables. While limitations of this quasiexperimental design are noted, the results appear promising enough to support replications of WINS.

KEY WORDS: case management; psychiatric disabilities; vocational rehabilitation; service integration; mental health services research; assertive community treatment.

INTRODUCTION

The significance of work in the lives of individuals with a psychiatric disability and its therapeutic potential has been widely recognized by professionals and advocates alike. Over the past 30–40 years, a variety of new interventions have focused on vocational training and/or employment opportunities for individuals with severe and persistent mental illness. While demonstrating some positive effects on clients’

vocational outcomes, this first wave of rehabilitation programs has been typified by freestanding, isolated models (e.g., clubhouse, Fairweather Lodge, etc.) not frequently available in most geographic locations or to most persons with severe mental illness. Also, as noted in several past reviews, the extent to which such vocational programming significantly affects independent, competitive employment rates is problematic (Bond, 1987, 1992; Lehman, 1995).

According to Cook, Jonikas, and Solomon (1991), we now confront the challenge of a “second wave” of vocational issues—developing and expanding vocational programming broadly for all clients. How such widespread availability can occur, however, has not been established. As is the case with other systems (e.g., substance abuse), access to services provided through vocational rehabilitation (VR) agencies is difficult for most persons with psychiatric disabilities. Additionally, individuals with

¹School of Social Work, University of Michigan, Ann Arbor, Michigan.

²Department of Psychology, Michigan State University, East Lansing, Michigan.

³School of Social Work, Boston University, Boston, Massachusetts.

⁴Correspondence should be directed to Carol T. Mowbray, Ph.D., School of Social Work, University of Michigan, 1080 South University, Ann Arbor, Michigan 48109-1106; e-mail: cmowbray@umich.edu.

psychiatric disabilities have less placement success in VR than persons with other disabilities (Rimmerman, Botuckl & Levy, 1995), and VR services do not seem to demonstrate much sustained impact on competitive employment for them (Bond, Drake, Mueser & Becker, 1997).

We now recognize that it is not appropriate or feasible to expect mental health consumers to negotiate unassisted through separate service systems—be they health, housing, or employment supports. Case management services are supposed to do this. However, most case managers have large caseloads and too little time to deal with services other than avoiding hospitalization and meeting clients' basic needs. Many case managers also lack knowledge about rehabilitation interventions or methods to support disabled workers in their jobs (Anthony & Blanch, 1987).

If we are to move beyond the very low employment rates (15% according to Anthony and Blanch, 1987) experienced by psychiatric consumers, we need models of how to integrate vocational services within existing mental health service systems. Several recent reviews indicate that coordinating vocational approaches with clinical care can significantly increase vocational outcomes, especially competitive employment rates (Bond *et al.*, 1997; Lehman, 1995). Russert and Frey (1991) describe how the Program of Assertive Community Treatment (ACT) has addressed this need. Research funded by the National Institute on Disability and Rehabilitation Research has identified other models of "hybrid case management/employment services." Through a variety of structures and settings, these programs utilize innovative ways to integrate vocational services with case management. The programs include an assortment of case management models besides ACT and are therefore applicable to a wider array of service sites than that described by Russert and Frey (1991). The program similarities involve taking an assertive approach to motivating clients toward vocational pursuits, using individually tailored vocational interventions, and providing indefinite follow-along services. Mowbray, Leff, Warren, McCrohan, and Bybee (1997) described six of these programs identified as exemplars. Results have recently been reported from a true experimental design evaluating one of these programs, Individual Placement and Support (IPS) in New Hampshire. This research found that in comparison to those in a brokered model (offering preemployment training and individual placements with support), clients in the hybrid/integrated program were more likely to

be employed and, when employed, earned more wages and worked more hours over an 18-month period (Drake, McHugo, Becker, Anthony, & Clark, 1996).

Project WINS in Grand Rapids, Michigan, was another of the six models of hybrid integrated case management/vocational services. Its purpose was to add resources to expand the vocational focus of existing case management teams in a large, suburban community mental health service system. Project WINS accomplished vocational integration in two ways: (1) vocational specialists were assigned to and worked closely with case management teams, and (2) consumers were employed as peer support specialists to function as case manager extenders, job coaches, role models, and lay counselors. Project WINS was funded as a 3-year demonstration project through the Substance Abuse/Mental Health Services Administration's Center for Mental Health Services (Community Support Program). The present report presents the results from a quasiexperimental research design which evaluated client outcomes from the Project WINS demonstration program over an 18-month period. We also contrast our results to a recent review of research on supported employment by Bond *et al.* (1997) and address issues and criticisms which that review raises.

BACKGROUND

Project WINS was sited in Kent County, Michigan, which operates a full management community mental health (CMH) board and provides a comprehensive array of services for persons with severe and persistent mental illness (PSMI). WINS services were housed in two large case management agencies that provide team-based case management services to all PSMI clients of the CMH board, serving a total of more than 1,000 persons, through either Assertive Community Treatment (ACT) or less intensive Comprehensive Community Treatment (CCT) team models.

WINS Service Model

The principles guiding Project WINS operations were based on the Choose-Get-Keep model of vocational rehabilitation, originally developed at Boston University Center for Psychiatric Rehabilitation (Anthony, 1980; Anthony, Cohen, & Danley, 1988).

In this model, staff focus on assisting individuals to choose a job or career of interest, to get a job congruent with their choices, and to keep that job so long as the participant finds it desirable. WINS also emphasized self-determination and minimal exclusion—with eligibility based primarily on clients' self-selection rather than staff determination of work potential. The major component of Project WINS' operations was the services provided by individual vocational specialists (VS). Seven of eight case management teams (ACT or CCT model) had an assigned VS, who provided *direct* services to a rotating caseload of about 20 of the team's clients. Direct services of VS to their clients included vocational planning, assessment, job preparation and choice, job acquisition, and job maintenance. Vocational specialists' activities also included job development and placement efforts on behalf of these clients. Additionally, VS provided *indirect* services to their assigned teams, by attending team meetings and by providing case consultation to case managers on the teams, and sharing information with them about vocational training and opportunities, employment rights of persons with disabilities, etc. The VS were recruited from positions in either rehabilitation or community mental health agencies; all were required to have significant prior experience in working with the other service system. In addition to working with a VS, clients were offered the opportunity to work with a peer support specialist (PSS), another consumer also served by the case management teams; PSS worked as case manager extenders and as role models for assigned clients (see Mowbray, Leff, *et al.*, 1996, and Mowbray, Moxley, *et al.*, 1996, 1998, for an extensive description of the role of the PSS in WINS).

Eligibility and Entry into WINS

Clients who were unemployed or already working were eligible for WINS services. Exclusion criteria for WINS were (1) clients who were uninterested or unable to work (including those choosing to be full-time parents or homemakers or those who considered themselves retired), (2) clients in long-term psychiatric care settings, and (3) those whose involvement in the labor force was precluded by severe medical or substance abuse disability or by acute psychiatric symptomatology. Prior to the initiation of WINS services, case managers from the participating teams were asked to identify *all* clients who *could* poten-

tially be served through WINS, utilizing the eligibility criteria. From a total of 690 clients served by the teams, case managers identified 147 clients who fit the exclusion criteria (or 21.3%). Clients classified as ineligible for WINS could be reconsidered at any time.

Clients became direct recipients of WINS services either through self-referral or referral to the assigned VS by case managers on the team. There were always more referrals than WINS staff could accommodate, and an ongoing waiting list was maintained. Each VS was responsible for prioritizing referrals received by discussing each individual's needs and work motivation with the treatment team.

Initial contact with prioritized clients occurred either through the case manager or through direct initiation by the VS. Clients who then confirmed that they wished to receive direct services from a WINS vocational specialist were scheduled to meet with the VS and to begin assessments of their work history, skills, training and support needs, interests, and vocational preferences. The client and the VS then developed an intervention plan that specified vocational goals, anticipated problems, kinds of help needed, and planned intervention activities (both those to be initiated by the VS and those to be followed up by the client).

All WINS services were individualized to address the specific needs and goals of each client. The main intent was to procure jobs of the client's choice in the community, in independent settings; however, more traditional VR placements could be arranged, as appropriate and/or requested by the client. Access to other vocational and related services was also available through WINS: vocational training programs, through VR, community education, or educational programs (GED, community college or university, or volunteer activity). Community jobs could be transitional or permanent, dependent on the client's needs and preferences. A priority was placed on presenting vocational options in a way that fostered client self-determination, encouraging clients to make decisions about their own vocational endeavors and to exercise choice about the support and assistance they required to attain their goals. The specialized direct services that WINS provided to individual clients were intended to be time-limited, following the process outlined in each client's service plan. Follow-along vocational services were to be provided by the client's case management team, with consultation from the WINS staff available at any time. (Additional information on program operations can

be found in Mowbray *et al.*, 1994; Mowbray, McCrohan, & Bybee, 1995; and Bybee, Mowbray, & McCrohan, 1995).

METHOD

Research Design

A quasiexperimental research design was utilized to determine the effectiveness of the WINS vocational service enhancement. Since case management services were provided on a team basis at both agencies and since WINS provided direct services to assigned clients as well as indirect services to the team, individual clients could not be randomly assigned to WINS versus the usual treatment without the likelihood of confounding. Thus, assignment to treatment condition was done by teams rather than by individuals; teams were assigned to one of three conditions: immediate treatment, delayed treatment, and control. This design was selected to maximize the likelihood of detecting change by including three time points and three sets of contrasts to examine. Of the eight available case management teams at the two agencies, one CCT was selected to be the control group. The other seven teams received direct and indirect WINS services according to the following schedule: after a baseline data collection, WINS services were immediately available to three ACT teams at the first case management agency and to one ACT and one CCT team at the other agency. Approximately 9 months later, after a second data collection, WINS services were expanded to two more teams (one each, ACT and CCT) at the second agency. Referrals to WINS from these five ACT and two CCT teams then continued throughout the duration of the research demonstration period, for about another 9 months. The control condition (the CCT team at the second agency) never received any specialized vocational services. Team assignments to the treatment conditions could not be random, for logistical reasons: The first agency had already begun implementing some less intensive vocational services on some of its teams; therefore its teams could not realistically be assigned to the control or the delayed-treatment conditions. Also, one team strongly asserted a preference not to implement vocational services during the intervention period because of management and staffing issues, so of necessity it became the control team. Finally, the CMH agency was not willing to have more than one of the teams constitute

a control condition due to the desirability of initiating vocational services agency-wide.

Research Sample

Because of the previously described factors, plus the fact that not all eligible clients could be interviewed due to funding constraints, selection and establishment of the research sample for WINS was somewhat complicated. The research sample consists of samples of clients who were interviewed from the teams which received immediate or delayed treatment, plus a sample of clients from the control condition. Clients from the control condition were not interviewed; however, for them and for the interview sample, data from records and case managers were collected.

Using a power analysis to determine desirable sample size and incorporating expectations about attrition, a sample of 437 was randomly selected from the pool of eligibles on the treatment teams into the interview study, and contacts were attempted; 304 (69.6%) agreed to participate. The remainder either refused ($N = 73$) or were in crisis, unreachable, or ambivalent and could never be scheduled ($N = 85$). There were some significant differences between those who did versus did not consent to interview participation: consenters were less likely to be minority, had higher education levels, were more likely to live independently and had higher functioning levels, on average (Mowbray *et al.*, 1995). Overall, these differences suggest that consenters (those participating in the interview) were more employable. Of the 304 consenters interviewed, 279 interviews were rated as generally reliable; this established the group of 279 as the interview sample.

Individuals in the interview sample were interviewed at baseline, then at 9 and 18 months; they were also subject to case manager ratings and record reviews. Although all case management team clients were potentially eligible for referral to WINS (except for the control team), interviewing and other data collection was done only for these 279 clients. It should also be remembered that the interview sample of 279 consisted of individuals *potentially* eligible for WINS services. Clients did not have to be in the interview sample in order to receive WINS service; WINS staff also served clients *not* in the interview sample, e.g., those not randomly selected from the eligible pool of 543, those who did not consent to the

interview, and new clients entering the agency.⁵ The outcome evaluation results presented in this report, however, are based on data from only the 279 clients from the interview sample (from the immediate and delayed-treatment conditions) plus 124 selected for the research sample from the no-treatment control group, for a total of 403.

Interview Sample Characteristics

About 60% of the interview sample were male, and 80% were White. Minority representation included African Americans (16.8%), American Indians (1.1%), Hispanics (1.1%), Asians (0.7%), and mixed heritage (.4%). The average age was 37 years. The majority were single and had never been married. Most (74%) of the participants were high school graduates ($M = 12.1$ years). Living arrangements varied: 38% lived alone, 26% in supervised settings, 23% with family, and 14% with friends or roommates. The most common diagnosis was schizophrenia (68%), followed by major affective disorder (21%), with 11% in other categories. Only one third had been hospitalized for mental illness in the previous 2 years. Mean age at onset of mental illness was 19.5 years ($SD = 12.7$). The average Global Assessment of Functioning Scale (GAF Scale, Axis 5 of the DSM-III) was 53 on a continuum of mental health–illness ranging from 1 to 90, which falls into a range indicating moderate symptoms or moderate difficulty with social, occupational, or school functioning (American Psychiatric Association, 1987). Nearly all were taking prescribed psychotropic medications (93.8%). Nearly all the individuals also had a work history, mostly in the previous 2 years. Forty percent were employed at the time of the baseline interview. However, the types of jobs recently held were typically in the unskilled–semiskilled category and provided very low wages. Nearly 90% reported that they wanted to work, and 71% expected to be working in a year. (See McCrohan, Mowbray, Bybee, & Harris, 1994, for a more extensive description of the employment histories, expectations, and desires of the interview sample.)

Measurement

Data were gathered from several sources: (1) one-hour-long, in-person interviews, conducted at

baseline by trained undergraduate students in human services fields, (2) reviews of mental health case records, conducted by trained data collectors using structured protocols, (3) checklists indicating clients' vocational and related activities, completed by case managers at the second and third data collection points, and (4) daily logs of WINS services maintained by the vocational specialists.

Interviews

Interviews gathered information about individuals' living situations (type and tenure), marital status, and employment history (baseline employment status; recency, duration, and pay level of employment; number of jobs held since age 15). Individuals were asked if they wanted to work and if they expected to be working in 1 and 5 years.

Other self-report measures were utilized at baseline and at the 9- and 18-month follow-up interviews: the Work Behavior and Attitudes Scale was developed for the interview as an adaptation of an observational measure of work behavior developed by Griffith (1973). Symptoms were assessed through the Symptom Checklist-10 (SCL-10), 10 items from the Brief Symptom Inventory (Derogatis & Melisaratos, 1983). Community functioning was reported with the Areas of Difficulty Checklist (Bond, . . . , & . . . , 1990, adapted for this study). Self-perception measures included Pearlin Self-Mastery (Pearlin & Schooler, 1978), Purpose in Life Scale (Reker & Cousins, 1979), and subscales and items from Lehman's Quality of Life Scale (Lehman, 1988, 1991). All scales utilized in the analyses had Cronbach alpha reliabilities of .66 and above (Mowbray *et al.*, 1994).

Case Record Reviews

Case records provided basic demographic information (age, race, sex), age at onset of mental illness, most recent psychiatric diagnosis, hospitalizations during the previous 2 years, and two ratings of individuals' functioning: Global Assessment of Functioning (GAF) ratings and Community Living Adaptation Scale (CLAS) ratings (used at this CMH by case managers quarterly to assess community living ability, including residential status, daily structure, financial management, etc.).

⁵Over a period of 29 months of project operations, 322 individuals were enrolled in WINS.

Case Manager Reports

At the 9- and 18-month follow-up time points, case managers were asked to complete a checklist summarizing clients' vocational and related activities in the last 6 months (CVAs).

Service Data

Service activity logs (SALs) were completed daily by vocational specialists and peer support specialists on the clients served directly by WINS. Information from the SALs included direct contacts and any other service activity on behalf of clients on their caseloads, and amounts of staff and client time for each client service activity.⁶ "Substantial" WINS service was defined as total VS service totaling 6 hr or more. "Moderate" service consisted of total contact time from 1 hr to 6 hr. The "minimal" service category involved clients who were referred to WINS, but received fewer than 60 min of staff contact.⁷ Those receiving no service were clients in the control condition, as well as those on the treatment teams who were never referred to WINS; usually this was because the clients on the team were institutionalized or otherwise not available for referral or not interested (either because they were already satisfied with their vocational activity, or they were not motivated toward vocational pursuits at the time).

Additional data on the types of jobs which WINS clients obtained while receiving project services were compiled through job data sheets completed by VS at the end of the project on WINS clients served.⁸

⁶Although the project initiated services in February 1991, reliable SAL data on VS service contacts were not produced until July 1991. Data on the identity of clients served before then are available from project records, but not on amount of service. For these 44 clients, levels of service were assigned based on duration of contact with WINS: 11 were assigned to the minimal category and 33 to the moderate category. Documentation of PSS contacts began January 1992.

⁷These were mainly clients who indicated interest in WINS, but never followed through after referral to complete a VS contact for a formal intake or service request.

⁸Vocational specialists were asked to complete job data sheets on all clients served during the project's approximate 24-month duration. However, sheets were completed on only approximately 61% of those who had more than minimal contact with the project. Analyses indicated that variables affecting completion of job data sheets included greater intensity of WINS' services, more recent receipt of service, and the case management agency referral source. Thus, information from the job data sheets should be interpreted cautiously, as describing the job activities of a subsample of clients.

The job data gathered included the type of activity (whether it was a paid job, training, volunteer work, school, or day treatment activity); the setting of paid jobs (competitive, sheltered, affiliated with a rehabilitation agency); a description of the job title, duties, and place of employment; the dates of employment; and reasons for termination of the jobs. The job data sheets only describe jobs held by the clients during the WINS demonstration period and jobs of which the VS were aware. The data on job duties and place of employment were used to code jobs into activity categories according to the Department of Labor's Dictionary of Occupational Titles (1991), as well as prestige categories according to Hollingshead's prestige scale (Hollingshead & Redlich, 1958).

Follow-up

Research assistants were given training in effective longitudinal tracking and interviewing methods (Ribisl *et al.*, 1996). They utilized extensive contact information which had been collected from participants at the baseline interview. At the second and third interview time points, 225 (80.6%) and 233 (83.5%), respectively, were reinterviewed. Data were available on all participants from case manager ratings (CVAs) and service activity logs (SALs).

Data Analysis Plan

Logistic regression analysis was used to examine the effects of condition and service amount on Time 3 outcomes. The outcomes examined included several dichotomous behavioral outcomes related to work or schooling: any paid work (competitive or sheltered workshop or enclave), work for more than 10 hours per week, competitive work, seeking work, volunteering, educational activities, prevocational classes, day treatment, and any productive activity (paid work, volunteering, or educational activity). Time 3 outcomes were selected as the target of analysis because the greater amount of time and consequently greater potential treatment exposure was expected to increase the likelihood of observing effects.

To examine the effects of condition and service amount on Time 3 outcomes, a two-step analysis strategy was employed. The first step involved comparison of all research participants in the three conditions on work-related outcomes. Because the design was quasiexperimental, with teams assigned to condi-

tion on a nonrandom basis, efforts were made to adjust for preexisting condition differences. Control variables included those showing Time 1 differences among conditions and Time 1 variables significantly predictive of Time 3 work outcomes. The second analysis step involved only individuals who could have received WINS services—those in the immediate and delayed conditions—and focused on the relationship between Time 3 outcomes and amount of WINS service received. Because individuals self-selected into WINS services to some extent, we could not assume that amount of services an individual received was independent of their preexisting likelihood of vocational success. It was possible that, without WINS, the individuals who sought vocational services and received them in substantial amounts would have been more successful than those who did not pursue vocational help. To adjust for the effects of such preexisting differences, characteristics found to predict postintervention work success, along with Time 1 variables that covaried with amount of WINS service received, were used as control variables in this analysis.

Other analyses were conducted with the interview sample data to examine changes in self-perceptions and the effects of condition and service amount on self-perceptions. Doubly multivariate repeated measures analysis of variance was used to examine these changes from baseline to Time 2 and Time 3. All the analyses results described below are significant at $p < .05$ at least (unless otherwise noted as marginal, where $p < .10$).

RESULTS

Descriptive Results

Table 1 provides data describing the amount of WINS service received by each of the two treatment groups. The immediate group received more services overall than the delayed group, as would be expected since these clients had a longer period of time in which they were eligible to receive WINS service. However, the two treatment groups were about equal in the percentages receiving a substantial amount of service. Individuals in the control group received no services.

Table 2 provides descriptive information on several outcome variables at Time 3, examined by condition and service amount. In terms of condition, on virtually all outcomes, greater percentages in imme-

mediate and delayed-treatment conditions demonstrated successful outcomes. For example, 69% of those in the delayed-treatment group engaged in some productive activity (i.e., work, education, or volunteer work) at Time 3, compared to 59% of those in the immediate-treatment group and 44% of those in the no-treatment group. Regarding service level, greater percentages of those who received moderate or substantial service levels demonstrated successful outcomes compared to those who received no service or minimal service. For example, 97% of those receiving substantial service were engaged in productive activity at Time 3, compared to 88% of those who received moderate service, 56% of those who received minimal service, and 54% of those who received no service.

Multivariate Analyses

Two sets of logistic regression analyses were conducted, one each to examine the effects of condition and of service amount. Because WINS utilized a quasiexperimental design, and consequently there was no random assignment to either condition or service amount, preliminary analyses were conducted to identify covariates demonstrating significant associations with condition and service amount, so that their effects might be controlled in determining the effect of condition and service amount on outcomes. Preliminary analysis was also conducted to identify baseline predictors of work at Time 3. This was necessary to control for any preexisting differences that might exist between conditions and service amounts that would confound the relationships between condition and Time 3 outcomes, and service amount and Time 3 outcomes. While several Time 3 outcomes were examined, all were related to work and work-related activities, hence the control of covariates related to work at Time 3 was determined to be sufficient for all analyses.

Condition Effects on Work Outcomes

Baseline variables were tested to determine if they were associated with working at Time 3. Four variables demonstrated significant associations with working: race, entitlement status, baseline functioning, and working competitively at baseline. Whites were more likely to be working (53%) than members of minority groups (35%), $\chi^2(1, N = 386) = 8.46$,

Table 1. WINS Service Amount by Condition ($N = 403$)

WINS service amount	Condition: exposure to WINS		
	Immediate (18 months exposure)	Delayed (9 months exposure)	Control (no exposure)
None (no documented contact with staff)	82 58.2%	97 70.3%	124 100.0%
Minimal (less than 60 min total staff contact)	16 11.3%	10 7.2%	0
Moderate (total staff contact 60–359 min)	26 18.4%	14 10.1%	0
Substantial (360 min or more total staff contact)	17 12.1%	17 12.3%	0
Total	141	138	124

$p < .01$. Those receiving entitlements were less likely to be working (47%) than those not receiving entitlements (63%), $\chi^2(1, N = 373) = 4.60, p < .05$. Those working at Time 3 were higher functioning at baseline on the Community Living Adaptation Scale ($t = 4.78, p < .001$). Finally, those involved in competitive work at baseline were more likely to be working at Time 3 (84%) than those not involved in competitive work (42%), $\chi^2(1, N = 372) = 34.06, p < .0001$.

Baseline covariates of condition were also explored as potential control variables in the analysis. Of the variables collected on all three conditions, five variables were found to be significantly associated with condition, including the four already found to be predictive of working at Time 3 (race, entitlement, baseline functioning [CLAS], and competitive work). The delayed and control conditions had significantly lower proportions of minority clients (14% and 19%,

respectively) than the immediate service condition (26%); $\chi^2(2, N = 396) = 6.30, p < .05$. A higher proportion of individuals in the delayed and control groups were receiving entitlements (91% and 92%, respectively) than in the immediate service group (74%); $\chi^2(2, N = 382) = 19.81, p < .0001$. The proportion in the control condition who were engaged in competitive work (7%) was much lower than in the immediate (19%) and delayed (20%) conditions, $\chi^2(2, N = 381) = 9.08, p < .01$. On community functioning, the immediate group was significantly higher ($M = 3.60$) than the control group ($M = 3.32$) in CLAS scores, with the delayed group indistinguishable from the other two ($M = 3.42$); $F(2, 375) = 6.09, p < .01$. Nearly twice as many in the control group (24%) were in day treatment compared with the immediate service group (12%); the delayed group (18%) was not different from the other two, $\chi^2(2, N = 380) =$

Table 2. Time 3 Outcome Variables by Condition and Amount of WINS Service Received

Time 3 outcome variable	By condition				By amount of WINS service (immediate and delayed conditions only)				
	Immediate	Delayed	Control	<i>n</i>	None	Minimal	Moderate	Substantial	<i>n</i>
Any paid work	50%	61%	37%	390	45%	40%	85%	85%	262
Work ≥ 10 hr/week	37%	38%	14%	229	31%	23%	55%	67%	229
Competitive work	21%	27%	12%	393	19%	8%	33%	50%	269
Seeking work	11%	3%	2%	353	3%	5%	15%	19%	234
Volunteering	5%	5%	3%	378	2%	9%	8%	12%	258
Educational activities	15%	17%	7%	386	13%	21%	15%	27%	262
Prevocational classes	17%	15%	18%	378	19%	9%	15%	6%	258
Day treatment	12%	23%	30%	248	28%	6%	3%	7%	174
Any productive activity ^a	59%	69%	44%	390	54%	56%	88%	97%	266

Note: Values are percentages engaging in indicated activity. Note that *n* values differ due to different amount of missing data on each Time 3 outcome.

^aProductive activity includes paid work, volunteering, or educational activities.

Table 3. Condition Effects on Productive Activity at Time 3 ($N = 365$)

Covariates	Model 1: Baseline covariates of work at T3				Model 2: Condition added			
	<i>B</i>	<i>SE</i>	<i>df</i>	Odds ratio	<i>B</i>	<i>SE</i>	<i>df</i>	Odds ratio
Race	-0.18	.28	1	0.84	-0.15	.28	1	0.86
Receiving entitlements	0.19	.34	1	1.20	0.22	.35	1	1.25
Functioning level (CLAS)	0.52	.18	1	1.69**	0.52	.19	1	1.69**
Competitive work	1.76	.46	1	5.84****	1.67	.46	1	5.33***
Condition							2	
Immediate vs. control					0.33	.28	1	1.40
Delayed vs. control					0.84	.28	1	2.31**
Constant	-1.70	.80	1		-1.76	.83	1	
Model χ^2				40.31****				9.34**
-2 log likelihood				458.54				449.21

* $p < .05$; ** $p < .01$; *** $p < .001$; **** $p < .0001$.

6.08, $p < .05$. However, in multivariate analysis used to determine which set of variables made independent contributions to account for variance between pairs of conditions, day treatment was not found to make an independent contribution, and was not retained in the logistic regression model examining the influence of condition.

The results of the logistic regression analysis examining condition effect on the outcome of productive activity are given in Table 3. After controlling for race, entitlement status, functioning (CLAS), and competitive work at baseline, the delayed condition demonstrated a significant effect, more than doubling the odds that an individual was engaged in productive activity at Time 3 compared with the control condition. However, the immediate versus the control condition effect was not significant.

For the remaining outcome variables examined,

odds ratios and model chi-square improvement are reported in Table 4. Six variables, in addition to productive activity, demonstrated significant condition effects. In two cases (working and competitive work), the delayed condition showed an effect, while the immediate condition did not. In two additional cases (day treatment and seeking work), the immediate condition showed an effect, while the delayed condition did not. In the case of educational activities, both immediate and delayed conditions showed an effect, with the delayed condition demonstrating the stronger effect. In the case of working more than 10 hours per week, both immediate and delayed conditions showed effects, with the delayed condition demonstrating a slightly stronger effect.

It had been expected that if there were differences between the two treatment conditions (immediate and delayed), the results would favor the im-

Table 4. Condition Effects on Other Time 3 Outcomes

Time 3 outcome variables ^a	Odds ratio		Model chi-square
	Immediate vs. control	Delayed vs. control	
Any paid work ($n = 365$)	1.22	2.20**	8.72**
Paid work ≥ 10 hr/week ($n = 306$)	2.45*	3.31**	10.99**
Competitive work ($n = 352$)	0.88	2.45*	7.94*
Seeking work ($n = 329$)	7.37**	2.08	10.02**
Volunteering ($n = 355$)	1.19	1.51	NS
Educational activities ($n = 361$)	2.46*	3.23**	8.26*
Prevocational classes ($n = 355$)	1.34	0.91	NS
Day treatment ($n = 231$)	0.37*	0.87	5.10†
Any productive activity: paid work, volunteering, education ($n = 365$)	1.40	2.31**	9.34**

Note: For each logistic regression listed here, the control variables detailed in Table 3 were entered prior to the final variable indicating condition. Odds ratios and model chi squares reflect the final step in each logistic regression.

^aValues of n differ due to different amount of missing data on each Time 3 outcome.

† $p < .10$; * $p < .05$; ** $p < .01$.

diate condition, since that group had the opportunity to receive WINS services for a longer period of time. Since the results showed a different pattern (more significant results with the delayed treatment condition), post hoc exploratory analyses were undertaken to explain these results, through a logistic regression comparing clients in the immediate condition at T2 (9 months) and clients in the delayed condition (who at that time had received no WINS services) with those in the control condition, utilizing covariates, as in the previous logistic regressions on T3 outcomes. It was expected that if there were any effects, they would be limited to the immediate treatment condition (since the delayed condition had not yet been assigned specialized WINS services). Results of this set of logistic regressions are shown in Table 5. Only four regressions were undertaken, since only four variables were significantly related to condition in simple bivariate analyses. Condition is a significant predictor of the vocational outcome variable for two of these four variables: productive activity and any paid work. In these two analyses, both the immediate and delayed conditions showed an effect, with the delayed condition demonstrating a somewhat stronger effect.

Service Amount Effects on Work Outcomes

Preliminary analyses again sought to determine two types of covariates, to be controlled in order to determine the effect of service amount on later outcomes: those associated with working at Time 3 and those associated with WINS service involvement.

Although baseline predictors of work at Time 3 had already been examined for the analysis of condition effects, these needed to be reexamined in this

analysis because the analysis of service amount effects was limited only to the immediate and delayed conditions. Nonetheless, the same set of baseline variables was found to be associated with working at Time 3 in this reduced sample: race, $\chi^2(1, N = 264) = 7.78, p < .01$; entitlement status, $\chi^2(1, N = 251) = 5.16, p < .05$; competitive work at baseline, $\chi^2(1, N = 250) = 20.05, p < .001$; and baseline functioning CLAS score $t = 3.97, p < .001$. One additional variable, age, was found to be significantly associated with working at Time 3, and was controlled in the analysis of service amount effects. Those employed at Time 3 were younger than those not employed (36.01 vs. 38.96; $t = 2.71, p < .01$).

The examination of variables associated with service amount identified three significant variables: length of time in current residence (1 year or less vs. more than 1 year), number of previous jobs (five or less vs. more than five), and expectations about working in the future. Those who were in their current residence 1 year or less were more likely to receive a moderate or substantial amount of service (33%) versus those who were in their current residence more than 1 year (22%), $\chi^2(1, N = 278) = 4.84, p < .05$. Those with five or fewer jobs were less likely to receive a moderate or substantial amount of service (14%) than those who had worked more jobs (32%), $\chi^2(1, N = 274) = 9.61, p < .01$. Individuals who, at baseline, expected to be working in 1 year were more likely to receive substantial WINS service (32%) than those who did not (14%), $\chi^2(1, N = 278) = 9.95, p < .01$.

For the multivariate analysis, service amount was dichotomized into none/minimal versus moderate/substantial categories to address otherwise small cell sizes. The results of the logistic regression analysis examining the effect of service amount on

Table 5. Condition Effects on Time 2 Outcome

Time 2 outcome variables ^a	Odds ratio		Model chi-square
	Immediate vs. control	Delayed vs. control	
Productive activity ($n = 364$)	1.71*	1.86*	5.97*
Any paid work ($n = 370$)	1.98*	2.23**	9.68**
Paid work ≥ 10 hr/week ($n = 370$)	1.96†	NS	NS
Competitive work ($n = 358$)	NS	NS	NS

Note. For each logistic regression listed here, the control variables detailed in Table 3 were entered prior to the final variable indicating condition. Odds ratios and model chi squares reflect the final step in each logistic regression.

^aValues of n differ due to different amount of missing data on each Time 2 outcome.

† $p < .10$; * $p < .05$; ** $p < .01$.

Table 6. Effect of Receiving Substantial WINS Service on Productive Activity at Time 3 (*N* = 240)

Covariates	Model 1: Baseline covariates of work at T3				Model 2: Baseline covariates of service receipt added				Model 3: Amount of WINS service added			
	<i>B</i>	<i>SE</i>	<i>df</i>	Odds ratio	<i>B</i>	<i>SE</i>	<i>df</i>	Odds ratio	<i>B</i>	<i>SE</i>	<i>df</i>	Odds ratio
	Race	-0.51	.35	1	0.60	-0.46	.35	1	0.63	-0.50	.37	1
Receiving entitlements	0.57	.44	1	1.77	0.51	.45	1	1.67	0.53	.47	1	1.69
Functioning level (CLAS)	0.44	.23	1	1.55†	1.03	.24	1	1.55†	0.28	.25	1	1.33
Competitive work	1.26	.48	1	3.53**	0.44	.50	1	2.80*	0.85	.52	1	2.33†
Age	-0.04	.02	1	0.96*	-0.04	.02	1	0.97*	-0.03	.02	1	0.97
Residential stability (in current home >1 year)					-0.15	.31	1	0.86	0.13	.33	1	1.14
Limited work history (≤5 jobs)					0.20	.32	1	1.22	-0.07	.33	1	0.94
One-year work expectation					0.76	.32	1	2.14*	0.59	.33	1	1.81†
Substantial WINS service received									1.95	.48	1	7.01****
Constant	0.27	1.18	1		-0.39	1.22	1		-0.41	1.25	1	-0.41
Model χ^2								6.71†				21.53****
-2 log likelihood								277.53				256.00

Note. Analysis of WINS service amounts was limited to intervention conditions only (immediate and delayed). †*p* < .10; **p* < .05; ***p* < .01; ****p* < .001; *****p* < .0001.

productive activity are given in Table 6. After controlling for predictors of work (race, entitlements, baseline functioning [CLAS], working competitively at baseline, and age) and predictors of service amount (residential stability, limited work history, and 1-year work expectations), there was a significant effect of service amount on productive activity.

Service participation effects on other outcomes can be found in Table 7. In addition to productive activity, service amount was a significant predictor of four other outcome variables. A moderate or substantial amount of service increased the odds of working by almost five times, more than doubled the likeli-

hood working more than 10 hours per week, and increased the odds of work-related activity such as seeking work (by more than four times). A moderate or substantial amount of service also reduced the odds by 80% that an individual would be in a day treatment program at Time 3.

Cases Omitted from Outcome Analysis due to Missing Covariate Data

Missing covariate data required the removal of 43 individuals from the analysis of condition or ser-

Table 7. Effect of Substantial WINS Service on Other Time 3 Outcomes

Time 3 outcome variables ^a	Odds ratio ^b	Model chi-square
Any paid work (<i>n</i> = 240)	4.92***	17.57****
Paid work ≥10 hr/week (<i>n</i> = 240)	2.15*	5.09*
Competitive work (<i>n</i> = 227)	1.80	NS
Seeking work (<i>n</i> = 209)	4.06*	5.39*
Volunteering (<i>n</i> = 233)	3.18†	2.69†
Educational activities (<i>n</i> = 236)	1.54	NS
Prevocational classes (<i>n</i> = 233)	0.74	NS
Day treatment (<i>n</i> = 158)	0.20*	4.92*
Any productive activity: paid work, volunteering, education (<i>n</i> = 240)	7.01****	21.53****

Note. For each logistic regression listed here, the control variables detailed in Table 6 were entered prior to the final variable indicating receipt of substantial WINS service. Odds ratios and model chi squares reflect the final step in each logistic regression.

^aValues of *n* differ due to different amounts of missing data on each Time 3 outcome.

^bOdds ratios are in comparison with the no-treatment control condition.

†*p* < .10; **p* < .05; ***p* < .01; ****p* < .001; *****p* < .0001.

vice effects on productive activity. The proportion of omitted cases was higher in the immediate (14%) and delayed (11%) conditions compared with the control group (3%); $\chi^2(2, N = 403) = 8.63, p < .01$. Within the immediate and delayed conditions, a higher proportion of individuals who received no or minimal WINS service were omitted due to missing data (17%) than were those who received substantial service (7%); $\chi^2(2, N = 279) = 4.37, p < .05$. No differences between the omitted and included cases were found on sex, race, age, baseline work, entitlement status, baseline functioning level (CLAS), or diagnosis.

Self-Reported Interview Scales

Doubly multivariate repeated-measures analysis of variance was conducted on the set of six self-report measures from the interview (Pearlin Self-Mastery Scale, Purpose in Life Scale, Lehman's Global Quality of Life, Work Behaviors and Attitudes, Symptom Checklist-10, Areas of Difficulty Checklist) to examine condition and service amount effects on these outcomes. A significant time effect was found, Wilks' lambda = .54; $F(12, 172) = 12.03, p < .001$; however, there were no significant interactions of condition or service amount with time.

DISCUSSION

Interpreting the Outcome Results

Since this was a quasiexperimental design, the preexisting differences in the characteristics of participants by condition and by service model needed to be addressed in outcome analyses. Therefore, the significant preexisting differences between groups by condition and by service level on relevant baseline variables were included as covariates in multivariate analyses predicting work outcomes. In these analyses, a condition effect was significant in terms of productive activity and on five of eight other work-related outcomes. Service amount effects were also found to be significant for productive activity and four of the other variables.

We had expected that the immediate-treatment group would have more positive outcomes than the delayed condition (because of the longer time frame available to effect change) and that both conditions would be superior to the control condition. While

the latter result was demonstrated, the former was not. That is, on most variables, the delayed condition actually had somewhat better outcomes. Post hoc analyses undertaken to examine T2 differences revealed fewer condition effects, but outcomes for the delayed and immediate treatment groups were both significantly better than for the control group. The explanation for these findings is not immediately clear. We attempted to control statistically for baseline differences across the three conditions; however, statistical controls cannot be used to fully equate noncomparable groups (Grossman & Tierney, 1993; Porter & Raudenbush, 1987). At baseline, the clients on the teams in the immediate condition appeared to be somewhat better functioning (less likely to be receiving entitlements, with higher CLAS scores, and less likely to be in day treatment). Perhaps this meant that there was less likelihood of their showing significant improvements in work-related outcomes. Another possibility is a "compensatory rivalry" explanation—that is, teams in the delayed condition knew that they would have vocational specialists added to their teams at the end of 9 months. In anticipation, perhaps they prepared their clients for work, and/or wanted to demonstrate that they could get clients jobs on their own, for example, by pursuing more referrals to sheltered workshops, or other services available through the vocational rehabilitation agency. This could explain equivalent outcomes for the immediate and delayed groups at T2.

To explain the differences favoring the delayed group at T3, we might speculate that the jobs obtained by Project WINS' clients in the immediate condition were short-term and/or unstable jobs, with little career potential. A similar conclusion was drawn by Bond *et al.* (1997). Thus, while individuals may have obtained jobs by T2, by T3 these jobs were lost. Furthermore, perhaps the vocational specialists were better at finding more stable jobs when they started working with the delayed-condition clients 9 months later. The logistic regressions partially confirm this explanation, finding that the immediate group was more likely to be "seeking jobs" at T3 than either the delayed or control conditions. Previous published results on this project also offer some confirmation for the suggested explanation: McCrohan *et al.* (1994) reported that many Project WINS clients obtained low-skill, high-turnover jobs.

On the self-report (interview) variables, although there were significant time effects, there

were no significant interactions for time by condition or for time by service amount on outcomes like quality of life, symptoms, self-esteem, community functioning, etc. This is congruent with results reported by Drake *et al.* (1996) on a similar integrated vocational/clinical intervention and to the conclusions in the Bond *et al.* (1997) review that results “lend little support for the hypothesis that supported employment programs have a generalized effect on other outcomes” (p. 343). Arns and Linney (1993) posit that this somewhat counterintuitive result can be explained with the hypothesis that changes in self-perceptions occur as a result of getting and keeping a job. The short amount of time available for follow-up in Project WINS may not have been long enough to allow for such sequential changes to occur. On the other hand, the self-perception and quality-of-life measures may be insensitive to change.

Comparison to Other Research Results

In comparison to results from research studies summarized in Bond *et al.*'s (1997) recent review, the outcomes from Project WINS are somewhat difficult to judge. The competitive employment rates for WINS clients were somewhat low (21–27%). However, if percentage with a schizophrenic diagnosis can be used as an indicator of severity (as suggested by Lehman, 1995), then WINS, with 68% of clients having a schizophrenic diagnosis, appears to have served clients that are more disabled than any of the other studies, and competitive employment rates might be expected to be correspondingly lower.

WINS also differed from other supported employment programs reviewed by Bond *et al.* (1997) in that some WINS clients preferred to start employment initiatives within the security and predictability of a sheltered workshop setting. Since WINS operated as much as possible on a “choice” principle, it respected desires of participants to start with sheltered work, but recontacted them periodically to ascertain their desires to move on to more independent employment. Thus, it does seem appropriate to include as positive outcomes any client-chosen, work-related outcome, including noncompetitive work. When “any work” is considered, WINS active conditions achieved 50% and 61% employment rates, which compare quite favorably with other studies.

The Project WINS results can be assessed

against some other topics raised by Bond *et al.* (1997). One is participation rate. In the present analysis, we report on service amounts by condition (Table 1). Those statistics indicate that only 26 of 103 participants in the immediate and delayed conditions (or 25%) received minimal services. (Note that the category “None” refers to those individuals never referred to WINS; this was appropriate, as WINS staff were not supposed to service all eligible clients.) Clients receiving minimal services were typically contacted by WINS program staff after a referral, but then did not show up for appointments or follow-up on agreed-upon vocational activities. Thus they should be equivalent to Bond *et al.*'s characterization of program dropouts. In their review, Bond *et al.* cite dropout rates of more than 40% as being common (p. 343). Our retention is better than this comparison figure.

Another limitation of many studies cited by Bond *et al.* is possible screening processes, which limit the generalizability of positive outcomes. In Project WINS, the exclusion criteria were intended to pose minimal limitations. This appears to be the case in that only 21.1% of all clients served by case management teams were screened out. Thus, our rate of inclusion seems appropriately high. Previous published reports on WINS indicated that the productivity of staff was also high (i.e., staff served about 80% of the maximum number expected, not taking into account startup, staff vacancies and leaves of absence, etc.; Bybee *et al.*, 1995).

WINS was conceptualized as a minimal-exclusion, client-determined model. That meant that other than for disability or client preference reasons, client characteristics should not differentiate those individuals from the public mental health system in this county who were referred/served versus not served by WINS. Previous analyses, however, indicated that this was not totally the case. That is, traditional labor market variables did successfully predict WINS participation (participants were more likely to be those with a greater work history, younger ages, and more education). However, these variables accounted for only a modest percentage above a chance prediction (17.1%; Bybee *et al.*, 1995).

A final point of comparison concerns the types of jobs acquired by supported employment participants. The Bond *et al.* review indicated that most jobs obtained were unskilled and entry-level. This was, unfortunately, the case for many WINS participants. On the Hollingshead rating, two thirds of jobs obtained were unskilled, versus 30% that were clerical,

sales, or minor professionals. According to Dictionary of Occupational Title coding, about 32% of WINS jobs were in benchwork, and 35% were in service industries. The jobs that could be obtained for participants were limited by a number of factors: the checkered work histories of participants and their resultant skill deficits in technology and computer equipment, as well as the difficulties in finding suitable jobs utilizing an individualized rehabilitation model. That is, Project WINS staff had to find or develop jobs for clients one by one, based on a client's preference, skills, etc. If the client left the job, the job slot was usually lost.

These results suggest two things: first, that there should be more emphasis on vocational training and/or higher educational opportunities, like supported education, being available for all individuals with psychiatric disabilities who are interested in jobs. Second, that integrated VR models need to have a tie-in to a larger job development resource. Then, rather than spending time finding or developing job slots that easily get lost, vocational specialists could tap into a diverse array of job possibilities and spend their time working with clients on selecting, getting, and keeping their jobs.

Methodological Limitations

The research design limitations associated with Project WINS need to be acknowledged. In terms of outcome measures, it should be noted that status (dichotomous) variables were used, rather than continuous variables like number of weeks worked, wages earned, etc. Unfortunately, data reported by case managers and project staff were not sufficiently detailed to allow construction of continuous variables.

The major shortcoming of the WINS research was its complicated design in which teams, not clients, were assigned to conditions and not all eligible clients could be interviewed. Statistical controls are likely to be the only method to address this issue. It was therefore encouraging to see positive results from our logistic regressions on work outcomes, examining effects of model assignment and of service amounts when appropriate covariates were utilized. However, the fact that effects for the delayed rather than the immediate condition are more robust is of significant concern.

The results need to be interpreted with caution. On several variables strongly predictive of vocational

success, the control group looked worse at baseline. Although we employed powerful statistical methods to adjust for these differences, it is rarely possible to remove their effects entirely. Additionally, we could not adjust for differences implied by the staff choice that led to the control team being designated as such. It seems possible that a portion of the condition difference in work-related outcomes could be attributed to the negative impact of staff who requested that their team not implement vocational services. Finally, higher attrition from outcome analysis in the WINS service conditions may have artifactually strengthened the condition differences. Due to missing covariate data, a higher proportion of individuals in the immediate and delayed conditions (particularly those who received no or minimal WINS service) were omitted from the outcome comparison. In the control condition, very few cases were omitted due to missing data. In other words, through differential missing data, the WINS service conditions may have been "creamed" to a greater extent than the control condition, creating a bias that also may have worked in favor of finding positive WINS effects. Of course, the opposite selection bias might have occurred, wherein those cases lost to follow-up were unavailable because they had left the treatment system because of better functioning. Finally, we must note the fact that overall only about 28% of clients on the treatment teams received moderate or substantial levels of WINS services, also limiting the generalizability of findings. Collectively, these caveats indicate that the results of this single study are not sufficient for unqualified conclusions about the effectiveness of integrating vocational services into case management teams. But the results are promising and suggest that this approach may be an effective way to deliver vocational services. Replication, with random assignment of a larger number of teams to conditions and with sufficient resources for repeated assessment of all clients eligible for WINS services, would allow stronger inferences and more definitive conclusions about the model's effects.

CONCLUSIONS

Results from Project WINS offers additional evidence of the effectiveness of an integrated model for case management and vocational services. In addition to their effectiveness, such models have the potential for being more easily accommodated within existing community mental health programs and also more

acceptable to managed behavioral health care providers (versus separate vocational services). WINS results also offer some challenges for improvement as well. While paid employment and overall productive activity was high, this was not true for competitive employment. Furthermore, the kinds of jobs obtained by WINS clients were mainly in lower status occupations, usually corresponding to employment situations which offer much boredom and sometimes noisome occupational conditions, but little in the way of stability, career advancement, or necessary fringe benefits. While at times starting with workshop employment or entry-level jobs may be the desire of the client, agencies need to ensure that better opportunities are also available beyond these beginnings, such as through education, training, or increased or more creative job development activities.

Project WINS experiences also indicated the need for improvements in research designs and methods. More standardized record-keeping systems and more valid management information systems might curtail resource limitations and allow expansion of data collection on larger cohorts and/or multiple sites to enhance generalizability and knowledge.

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