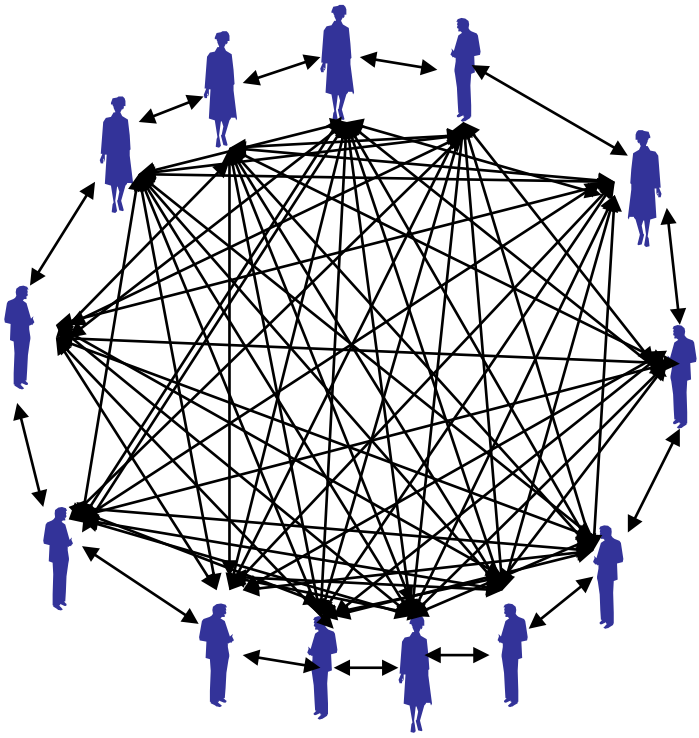
Integration at Work: Multiple Research Methodologies in Research



Edited by
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Integration at Work: Multiple Methodologies in Research

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Introduction: Working at Integration

Dennis Sandow
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". . . prevailing trends point towards new systems of participative autonomy or social participation. . . . the process is spontaneous, unavoidable and beyond the manipulations of tired and increasingly irrelevant social engineers and planners." (Zeleny, 1988)

"When Myra was released from a state institution she wondered, 'Geez. This is big. I wonder what's out here? When I was growing up, I figured I would never move out on my own and always be a burden. I'd never know how to cook or sew. I'm dumb. I'm stupid. That's what I thought. Now I know some other things.'" (Dreyfous, 1990)

"True integration will be achieved by true neighbors who are willingly obedient to unenforceable obligations." (King, Jr., 1963)

These are but a few of the many ways social integration can be defined. Milan Zeleny (1988) reflects an interest in the social integration of knowledge that transcends the classic management hierarchy. Myra describes a private experience of social integration in her move from a state institution for people with disabilities to a community where she now lives with her husband Billy (Dreyfous, 1990). Martin Luther King, Jr. (1963) offers a powerful definition of social integration from the perspective of a civil rights leader amidst the turmoil of social change in the mid 1960s. Each of these "definitions" of social integration is very different from one another. Yet when considering the context of Milan Zeleny, Myra, and Dr. Martin Luther King, Jr., who could improve upon their "expert" definitions? The purpose of this monograph is to introduce several ways of looking at social integration and to argue that multiple methodologies will allow supported employment research to have a greater understanding of the meaning of integration.

Since the mid-1970s the integration of people with severe disabilities with those without disabilities has been an important dimension of both policy and practice. The Education for All Handicapped Children Act (PL 94-142) included integration, or "mainstreaming," as a primary component. Similarly, residential services (Bradley & Bersani, 1990) and employment services (PL 99-506) have stressed the integration of people with severe disabilities as an outcome. Supported employment exemplifies both policies and practices that result in the integration of employees with and without disabilities. As conceived in 1984, supported employment policy required that services result in outcomes

including "(a) paid employment in (b) integrated settings for (c) people who require ongoing support" (Will, 1984). In response to this policy, service organizations supported more than 32,000 individuals with disabilities in 1988, a 226% increase since 1986 (Moon, Inge, Wehman, Brooke, & Barcus, 1990).

The continued growth of supported employment is guaranteed by three powerful factors. The first factor is the success of supported employment. The growth in employment of citizens with disabilities in companies across the country is an important measure of this success. Equally important is the acceptance of employees with disabilities by those workers who have no apparent disabilities. This cultural measure defies a tradition of exclusion and nonacceptance. In a unique blend of public resources and private enterprise opportunities, supported employment is unencumbered by regulations. Typically, service programs for consumers with developmental disabilities are defined by regulations that prescribe ways in which services are to be offered. Supported employment policy, however, has guided implementation by focusing on service outcomes that include the integration of employees with severe disabilities.

The second factor is the recent passage of the Americans with Disabilities Act, which is aimed at preventing discrimination against people with disabilities (Hunsicker, Jr., 1990). Affecting all employers employing fifteen or more employees, employers cannot refuse to employ, on the basis of disability, an applicant with disabilities who is qualified to perform the job. The Americans with Disabilities Act will take effect in 1992 (two years after the Act's enactment), insuring continued impetus for hiring workers with mental retardation.

The third, and final, factor relates to rapidly changing workforce demographics (Fosler, 1989; Johnston & Packer, 1987; Swaboda, 1990). We will quite likely see an increase in employment of people with disabilities as employers assimilate citizens with disabilities into their ongoing recruitment and selection activities in order to offset labor shortages. The growth in supported employment will not only result in a significant shift in employment opportunities for people with disabilities but will also result in an equally significant shift in the social fabric of workplaces as employees with and without disabilities work together.

The literature in supported employment has traditionally emphasized the immediate and practical concerns of job development and vocational training issues. Measures such as placement numbers, wages earned, and hours worked were seen as indicators of success. It soon became apparent, however, that compliance with the federally supported employment policy requiring physical integration (groups of fewer than eight persons with disabilities per setting) did not necessarily result in social integration of people with disabilities

(Hagner, 1989). These findings confirm research conducted in schools (Gaylord-Ross, Gaylord-Ross, Siegel, Lee, & Jameson, 1987) that indicates that individuals with disabilities may be socially isolated even within integrated settings. Recently, research has focused on a more diverse set of variables associated with integration rather than on placement numbers. One line of inquiry has focused on specific behaviors of supported employees that contribute to successful job placement. An early study of competitive employment by Foss and Peterson (1981), for example, found that job placement specialists rated humor, joking, and pranks as the least important social behaviors for successful job placements. Another early study found that incompetent social behavior of employees with disabilities was identified as being a major reason for job loss (Greenspan & Shoultz, 1981). Cheney and Foss (1984) identified categories of social behavior (problems with supervisors, problems with co-workers, and disruptive social behavior) that caused employees with disabilities to lose their jobs.

This view of social behavior as having an impact on job placement led researchers to attend to the effectiveness of training for appropriate social skills to supported employees. Conversational skills of three competitively employed adults with mental retardation, for example, were reported as increasing after a social skills training package and verbal prompts were used (Chadsey-Rusch, Karlan, Riva, & Rusch, 1984). Agran, Salzberg, and Stowitschek (1987) found that social competence ratings, as judged by a shelter workshop supervisor, increased when five sheltered employees were trained using a social skills training package.

In identifying social competence factors, however, Salzberg, Likins, McConaughy, and Lignugaris/Kraft (1986) suggested that competence is "an evaluative term that reflects a judgment about the adequacy of a person's behavior" (p. 227) and that the social context as a basis for this judgement may vary. Not surprisingly, the social context in which supported employees work has more recently become a second line of inquiry. Chadsey-Rusch's (1990) observation that "social integration implies that employees with and without disabilities are incorporated into and share the same social network in the workplace" (p. 161) would suggest that the workplace environment, rather than the individual with disabilities, be the focus for both researchers and supported employment providers to ensure the successful placement of supported employees.

In some of the first analyses to focus on supported employment within the workplace, researchers and service providers have responded to reports of voluntary co-worker involvement in supporting employees with disabilities. A survey of co-worker attitudes (Shafer, Rice, & Metzler, 1989), however, revealed that contact alone did not significantly improve co-workers' perceptions of social and vocational

competence of workers with mental retardation. This finding suggests that employment specialists need to focus on providing services that ensure that their consumers will experience maximal social integration and contact in the workplace, actively programming for social integration to occur after work with nondisabled peers, and continuing to enhance the vocational competence of their supported employees. The use of co-workers as a naturally occurring "social network" of trainers and advocates was suggested by Shafer (1986). Nisbet and Hagner (1987) elaborated on this theme by advocating new models of job support that use co-workers in the place of job coaches. Research pursuing this line of inquiry followed slowly. Studying seven supported employees using ethnographic techniques, Hagner (1989) found that the substitution of job coaching services for the naturally occurring training process conducted by co-workers inhibited the possibility of an ongoing bond between employees with and without disabilities. In his conclusion, Hagner suggests that an important goal of support services should be the development of a network of colleagues and allies for supported employment. A similar inhibition of naturally occurring work-related interactions is also evident in other research (Storey, Rhodes, Sandow, Loewinger, & Petherbridge, 1991; Yan, Storey, Rhodes, Sandow, Petherbridge, & Loewinger, 1990). Training co-workers in training techniques for use with supported employees has also generated secondary benefits. Mank, Oorthuys, Rhodes, Sandow, and Weyer (in press) found that co-workers rated the new training techniques as useful in their daily work with other co-workers.

In a short period of time, the research agenda for integration has expanded from the micro-focus on the behavior of the supported employee to the social environment of the workplace to the possibility of co-worker involvement in training and supporting the workers with disabilities. Several important observations of this evolution have driven the development of this monograph:

1) There is still a great deal that researchers and providers do not understand about the integration of workers with disabilities in the workplace.
2) Supported employment integration research to date has been confined to a narrow research design paradigm.
3) Existing research has not looked to relevant social integration literature from other fields.

These observations will be briefly addressed in the following sections.

Social Integration as Research: What We Don't Know CAN Hurt Us

The studies cited above have illuminated what we have yet to learn about social integration. Being a relatively new area of inquiry within supported employment, there is still a lack of depth and texture to our understanding of integration issues in the workplace. We know, for instance, that when compared to supported employment nationwide, research has investigated but a small fraction of those individuals with and without disabilities who have been affected. Many questions exist concerning the various characteristics of individuals with disabilities and how support agencies can facilitate social integration. Characteristics such as communication skills, severity of disability, social skills, age, and gender are beginning to be addressed, but neither researchers nor providers completely understand their impact on social integration.

It is also clear that research has investigated only a small fraction of employers and work environments where employees with developmental disabilities have been integrated. While methods for assessing the work environment are currently being created for use by service provider agencies (Buckley, Mank, & Sandow, 1990; Storey, Sandow, & Rhodes, 1990), the field is far from understanding various aspects of workplace cultures.

Finally, the social confluence of employees with and without disabilities who have been socially separated from one another is resulting in rich anecdotal experiences from the employees and their managers, as well as supported employment providers (Hagner, 1989). Because of the limited number of researched settings and subjects as compared to the sum of workers affected by supported employment and the novelty of the social experience for employees with and without disabilities who have been physically segregated, it may be wise to expand, rather than narrow, the focus of integration research.

Adherence to Narrow Research Perspectives

The previous review of supported employment research reveals that the majority of studies cited adhere to the quantitative tradition that permeates most special education research. An in-depth critique of this tradition is beyond the scope of this introduction, but interested readers should turn to Heshusius (1982, 1986); Skrtic (1986); and Stainback and Stainback (1984) for arguments that demonstrate the limitations of quantitative research and argue for qualitative alternatives. While this methodological debate between qualitative and quantitative research perspectives has raged in various forms in other fields, e.g., Hatch (1985), Lather (1986), Oakley (1981), and Smith (1986), it has only recently surfaced in disability studies. A closer examination,

however, reveals a small but lengthy tradition of qualitative or ethnographic studies going back to Edgerton's (1967) classic study of people with mental retardation living in the community. The qualitative study by Olson and Ferguson in this monograph briefly reviews that tradition.

Research in supported employment has been dominated by the same quantitative methods that also typify special education. Hagner's (1989) study of eight supported employees in their work environments is among the first to deviate from this reliance on quantitative methodology. Yet, it strikes us that the issue of social integration and workplace relationships is perfectly suited to qualitative methods that strive to understand the meanings individuals construct in their everyday lives. Understanding a worksite, the relationships among workers, and the impact a worker with a disability such as mental retardation has on the culture of a worksite are concepts that cannot be fully understood with observational checklists or questionnaires. The complexity of these issues requires that research ask different questions and therefore use different methodologies.

Rather than replicate the quantitative-qualitative debate, it is our intent to expand our knowledge base by proposing that researchers move even further into realms heretofore unexplored by vocational and disability research. Just as Skrtic (1986) argued strongly for a multidisciplinary and multiparadigmatic stance for special education, this monograph will demonstrate that employment research would greatly benefit from a multiple, rather than from a single, research method. The benefit of addressing research questions from several perspectives is exemplified in the three studies reported here that focus on one worksite. The three studies ask different questions concerning social integration and therefore arrive at different, but complementary, answers.

Contributions From Other Fields

Given the scarcity of research mentioned above, it is a particularly opportunistic time to turn to other fields for related research. Fields such as sociology, psychology, communication, and business may use different ways of talking about surprisingly similar research concerns, such as social integration, social networks and workplace environments. Twenty-five years ago, for example, "social facilitation" was discussed in psychology (Zajonc, 1965) as the impact of the presence of other people on individual behavior. Zajonc's study of group dynamics suggested that social behavior involves vast networks of individual effects, some of which may function as cues to appropriate or inappropriate responses.

Moving forward to more recent studies in psychology, Allcorn (1989) described group behavior as arising from a core of individual psychological processes. Allcorn's model assumes that although group behavior is comprised of individual psychological processes, it is possible to understand the group as a whole.

In sociology, Wolfe (1970) suggested including all forms of social relationships under the heading of "social network." In his review of social network theory, Wolfe points out that network analysis has resisted standardization because "real data suggest no standardized techniques at all but rather highly idiosyncratic ex post facto interpretations of data collected originally for other purposes" (p. 229). This quote suggests that in sociological research, network analysis has already encountered issues of validity and methodology that social integration research in supported employment is just now recognizing. Wolfe also points out that it is imperative that the dynamic perspective of the social contexts in which decisions are made be maintained in the design of any standardized social network analysis.

The process in which new employees are socialized to a new work environment would seem particularly relevant to supported employment practice. Not surprisingly, socialization in workplace settings has also been of particular interest to business management. Ashworth and Mael (1989), for example, used social identity theory to describe how new employees (newcomers) are concerned with building a self-identity in terms of group membership at work. Social identity refers to a process of defining self and others and enabling individuals to identify themselves in the social environment. According to Ashworth and Mael's interpretation of social identity theory, an individual new to an environment will engage in activities perceived to be congruent with group identity. Seeing himself or herself as an exemplar in the group is personally reinforcing.

The new employee is also the subject of Reichers' (1987) research. Using an interactionist perspective, Reichers suggested that companies increase the rate of socialization through orientation and training programs. The sooner this socialization process takes place, the sooner the new employee will become a productive member of the company by independently being able to seek and obtain information necessary to perform the job and to solicit performance feedback. The research on socialization recognizes that businesses have a stake in understanding the social dynamics of work environments, an understanding to which supported employment research can also contribute.

While the preceding research has focused on individuals and groups within organizations and business, management theorists have recently directed their attention toward management structures guiding the organization. Business management leaders, for example, have characterized employee networks as replacing traditional management

hierarchies (Kilmann, 1990; Zeleny, 1987). In this context, employee participation can be regarded as a form of social integration. Management leaders assert that the "information age" has resulted in employee groups having access to knowledge that is valuable to the company's products or service. Frequently this knowledge is shared through social behavior. Zeleny (1987), for example, refers to this socialization across all levels of a company as the integration of knowledge within an organization. Similarly, Kilmann (1990) believes that formal authority in organizations will be "replaced by whoever has the relevant information." (p. 24) Kilmann asserts that to be competitive, "networked organizations must nurture their culture and their human resources." (p. 24) Both Kilmann and Zeleny appreciate the value of employees being "socially integrated" and suggest activities that would restructure management from the traditional hierarchy to increased employee participation. This shift of focus has important implications for the introduction, training, and acceptance of supported employees within work environments by stressing the dynamics of co-worker support and involvement.

This brief review of research and literature from these different fields is not meant to be all-inclusive, but instead demonstrates the potential value other fields hold for social integration in supported employment. Zajonc's (1965) research suggesting that networks of individuals provide cues as to appropriate and inappropriate workplace behavior is still useful to supported employment providers who are redirecting work-related instruction or cues for appropriate behavior from the job coach to co-workers. Wolfe's (1970) findings regarding the highly idiosyncratic nature of social network analysis would suggest that supported employment providers and researchers approach each new employment setting as unique and avoid the temptation to provide all businesses with the same static, prescribed model of support. Both Ashworth and Mael's (1989) and Reichers' (1987) research reinforce the importance of allowing the supported employees to seek their own identity within the new employment setting and suggest that providers be careful not to inhibit interactions between employees with and without disabilities, particularly in the initial "newcomer" stages of employment. The importance of facilitating new employee socialization may provide the solution to Hagner's (1989) findings of social isolation resulting from over dependence on support from a job coach.

Zeleny (1988) and Kilmann (1990) suggest that employee participation is an undeniable trend in organizations. If this is true, support providers can increasingly rely upon co-workers to "support" employees with disabilities through the sharing of relevant work information. Instead of teaching a supported employee how to perform a job, researchers and service providers might investigate methods to

"connect" employees with disabilities to co-workers who have the necessary information.

As providers and researchers in supported employment turn their attention to future programmatic developments, such as the role of the co-worker, sources of work-related instruction, and the building of relationships between employees with and without disabilities, research from other disciplines may prove to be a worthwhile starting point. Certainly researchers and service providers will find that social research from other fields offers compelling concepts and theories that can help direct their social integration study.

Before proceeding, it may be helpful to consider the knowledge taxonomy proposed by Zeleny (1987). He describes four levels of knowledge. The "know nothing" level is characterized by individuals "muddling through" or finding their way through a new situation or event. The "know what" level is characterized by an individual knowing what to do when a situation or event arises, in other words, becoming effective. The "know how" level has the individual knowing not only what to do but also how to do it, in other words, becoming efficient. Finally, Zeleny's fourth level, "know why," is characterized by knowing why things must be done in a certain manner, or becoming wise.

Drawing upon the body of research knowledge concerning social integration discussed above, it may prove useful to apply Zeleny's taxonomy as an organizing framework. At the "know nothing" level, researchers and practitioners have come upon new discoveries due to the degree of novelty of the social environment. This level of knowledge has been characterized by Wolfe (1970), who reported that social network analysis resisted standardization of a social network analysis tool due to "highly idiosyncratic ex post facto interpretation of data." (p. 229) Similarly Salzberg, Likins, McConaugh, and Lignugaris/Kraft (1986) suggested that employment success was both a highly subjective and variable concept requiring a combination of measures to gauge success. Both Wolfe and Salzberg et al. indicated that evaluating the rich variability of social behavior at work requires a larger and more divergent set of measures. The subjectivity of work environments does not present an opportunity to standardize a measurement tool, but instead it creates a challenge to capture the richness of the environment. The contribution of the "know nothing" level of research is in its discovery of new principles, themes, and theories arising from the novel situation.

The "know what" level of knowledge in social integration research can be represented by the research concerned with social competence at the workplace (Calkins & Walker, 1990; Foss & Peterson, 1981; Greenspan & Shoultz, 1981). In order for the social behavior of the employee with disabilities to become a positive component of work,

social competence researchers advocate changing individual social behavior from incompetent to competent. The concept of competence suggests that if we can "fit" the social behavior of the employee with disabilities to the employees without disabilities we would "know what" to do to support the social integration process.

The "know how" level of knowledge includes research in supported employment and communication (communication being an integral part of social behavior). Researchers studying the acquisition of new social behaviors (Agran, Salzberg, & Stowitschek, 1987; Chadsey-Rusch, Karlan, Riva, & Rusch, 1984) focus on techniques that explain "how" social integration can be enhanced. Combined with the research of communicative behavior (Goetz, Gee, & Sailor, 1985; Halle, 1987; Mirenda, 1987; Reichle, York, & Eynon, 1989), these research findings help providers replicate effective and efficient support techniques, or "know how," to teach new social behaviors.

At the "know why" level, researchers have attempted to understand why social integration occurs as a result of supported employment practices. Hagner's (1989) effects of the job coach, Chadsey-Rusch's (1990) definition of social integration, and Ashworth & Mael's (1989) use of social identity theory all consider why social behavior occurs in the manner it does at the workplace and why it is important to consider how we view and act upon the social integration of employees.

The purpose of this monograph is to offer studies of social integration that will help researchers and practitioners of supported employment to think about the way in which they view social integration of employees with disabilities in the workplace. Three research methodologies—direct observation, clique analysis, and qualitative participant observation and unstructured interviews—are used to look at the relationships among eight people with disabilities, their supported employment supervisor, and their co-workers in one company, NEC America, Inc., Oregon Plant. The three studies are presented using the same pseudonyms for the participants so that the reader can appreciate the depth and breadth of the knowledge created by studying the subjects employed in the same setting in the same time period using three distinctly different methodologies.

The direct observation method used by Storey, Rhodes, Sandow, Loewinger, and Petherbridge (1991) has been used in studying social networks (Glascoe & Levy, 1985) and in measuring social integration in supported employment settings (Chadsey-Rusch & Gonzalez, 1988; Storey & Knutson, 1989). Direct observation procedures involves a researcher observing the social behavior and, in turn, coding the collected data into interaction typology. Structured direct observation procedures are purported to be objective and sensitive to treatment effects.

The next article by Yan and his colleagues uses clique analysis, a quantitative tool that has been applied to social sciences by researchers since the 1940s (Yan, 1988). This methodology uses data from direct observations to describe the composition and structure of social groups formed at work settings. The clique patterns enhance our understanding about the extent of social involvement of employees with disabilities by portraying the patterns of the entire work group.

Qualitative research has a long history in sociology and anthropology. Sometimes called naturalistic, qualitative research occurs in natural environments and uses nonobtrusive observations and unstructured, open-ended interviews to understand how people construct meanings and relationships in their lives. The study here by Olson and Ferguson focuses on how the co-workers without disabilities perceive and come to understand their relationships with the supported employees.

The three studies do not offer a complete understanding of social integration or even exemplary methodological rigor. The fact that all three methodologies were performed at the same time and in the same setting with the same subjects is of value in demonstrating the complementary nature of the research findings. The studies also point to the many gaps that still remain in our understanding of the nuances of relationships among workers. The implications of these three studies taken as a whole will be discussed in the conclusion to the monograph.

We believe this research will provide new insights into social integration, which we hope will in turn result in new approaches to, and understanding of, support. For policy makers, we believe the monograph will reinforce the need for the continued diversification of research methods studying social integration. Finally, we hope that the monograph will encourage researchers to "desegregate" social integration research and increase the utilization of multiple research methodologies.

Before beginning this journey into multiple methodological realms, however, the worksite and the workers will be introduced by the supported employment on-site trainer and an NEC America, Inc. production supervisor.

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An Introduction to NEC America, Inc. Oregon Plant

Wendy Taliaferro
John Oorthuys

Editor's note: NEC America, Inc. Oregon Plant is located in Hillsboro, 14 miles from Portland. NEC America, Inc. Oregon Plant employs approximately 600 employees and manufactures fiber optic transmission systems, digital multiplexing equipment, satellite telecommunication systems, and cellular mobile phones. The facilities of NEC America, Inc. are divided into two large manufacturing buildings and an administrative office.

In 1987 a job analysis conducted by Paul Crowther, Executive Director of Oregon Employment Services Corporation (OESCo) and Dennis Sandow, Research Assistant with the University of Oregon's Specialized Training Program, targeted the component preparation area of NEC America, Inc. as the location for an enclave. Including the enclave, the component preparation area consisted of approximately 15 employees without disabilities and 8 employees with disabilities. The area was supervised by John Oorthuys, an NEC America, Inc. employee.

Wendy Taliaferro was employed by OESCo to supervise the employees with developmental disabilities in the enclave. In this chapter she describes the employees of OESCo and NEC America, Inc. who participated in the studies featured in the following chapters. John Oorthuys describes the current work situation for each of the individuals with disabilities who is employed at NEC America, Inc. These two descriptions are followed by "official" descriptions from individual intelligence test performance and the nature of communication used by each individual.

The purpose of this chapter is not to explore the relative merits or disadvantages of the enclave model. That discussion is moot because by 1989 NEC America, Inc. had made the decision to disperse the workers with disabilities throughout the plant.

Description of NEC America, Inc. Oregon Plant

Wendy: If you don't have a badge stating you are an NEC America, Inc. employee you must be signed in at a security desk. Before entering the NEC America, Inc. production floor you must put some blue booties over your shoes to keep the floor clean and static electricity down. When the door opened and I had my first glimpse of the NEC America, Inc. production floor I was reminded of Aldous Huxley's *A Brave New World*. Everything about the place seemed sterile and immaculate. It was wide open with bright lights and machinery everywhere. There were aisles of

machines and tools, with people all spread out and working intently. Two automated machines rode throughout the plant between some yellow and black stripes on the floor. You could hear music playing dimly in the background, and the hum of the machines added to the beat. I was awed by it all.

Everywhere I looked I saw people busily working, and each person had the same blue work jacket on! They also wore tennis shoes with straps on the heels and cords that went up their legs and attached to their calves. Another cord was attached from their wrists to the stations they were working at, as though they were literally tied to their work. Suddenly a beep went off over the music and everyone with a blue coat on rose and filed out the door. Everyone seemed in sync but me.

When I eventually began working at NEC America, Inc., having my own blue jacket made things much easier, but I still had trouble finding my own group when we went to lunch. Thank heaven for a woman from component preparation who had hair down to her waist. I could always find her among the sea of blue in the cafeteria. Although everyone wore the same clothes and seemed robotic to me at first, after my initial introductions, I consistently found warm and friendly faces welcoming me to the NEC America, Inc. family. Enthusiasm and sincerity seemed to abound in the people there.

John: When the idea of having people with learning disabilities was first presented to the supervisors, it was met with a less-than-enthusiastic, but nevertheless, positive response. At that point it had not been decided where in the process we would place the enclave. I personally had a very limited exposure to developmentally disabled people and really had no idea what to expect. I had concerns about the ability of these people to fit into our environment and how they would be accepted by the rest of the employees they would be working with.

The University of Oregon, along with OESCo, then did a job analysis throughout the manufacturing process and came to the conclusion that the component preparation area had the right match of job skills and work available for the enclave. This turn of events brought my concerns right to the surface. This was my area, and I would have to be dealing with them directly.

The questions that I wanted answers to were:

Can these people do the work we have available?
Can they meet our strict quality requirements and how will our customers react?
Will they require extensive support and will that be distracting to the other workers?

Will they make noises or have other behaviors that will be disruptive to the workers around them?
Will there be a negative impact on co-workers perception of the value of their own contribution to the organization when people with severe disabilities begin to do the same work?

Some of these questions were answered when I had the opportunity to visit a similar high-tech manufacturing facility that had two years experience with an enclave. I was able to see disabled workers using power tools and soldering irons, producing high-quality work. I also observed in the lunch room some of the social interactions between the workers with disabilities and the other company employees. This demonstrated acceptance by the co-workers.

The next step was to bring back the University of Oregon (Dennis) and OESCo (Paul) for in-depth task analysis in preparation for the first worker. It was at this time that we shared what we were planning to do with the workers in the component preparation area. Over the next couple of weeks Dennis and Paul were able to answer many questions for the co-workers. Then Wendy came on board for her training as the enclave supervisor. Wendy's positive and friendly approach helped gain the confidence and acceptance of the co-workers and really set the stage for bringing on the first member of the enclave.

> *Editor's note:* Wendy began supporting individuals with disabilities when the first disabled worker, Larry, began to work at NEC America, Inc. in June of 1987. The remaining supported employees were phased in during the subsequent months.

Larry

Wendy: Larry was the first person with developmental disabilities to begin working at NEC America, Inc. He is a very vivacious and good-natured man. He is interested in people and can make friends at the drop of a hat. He began to carpool with an NEC America, Inc. co-worker soon after he started. He understands bits of English and Spanish and can flirt in either language. Although Larry is very limited verbally he can always get his message across by combining sign and pantomime. People from all over the plant came by to visit with him. This was wonderful, but initially he often got very little work done.

Larry was never intimidated by NEC America, Inc.'s high-tech environment and seemed to settle in quickly with both the work and the people. He very quickly learned jobs and the other routines of NEC America, Inc., such as getting his equipment and clothing on in the morning, testing his equipment every Monday, and learning where

supplies were kept. My main support to Larry was in finding incentives to keep him working. It was interesting to me that people often talked about how fast Larry worked even when he first arrived. His productivity increased by about 26 percent by the end of his first year, and as of February 1990 it had increased by another 10 percent.

Later Larry had some esophagus trouble and began to vomit frequently, especially during lunch. This affected some of his lunch buddies, who at first thought he might be doing it on purpose! After I explained Larry's medical condition to them, they were much more thoughtful and sympathetic. They began to notice when he vomited and what he ate, so that we could inform his family and doctor.

One of my favorite stories about Larry involves a birthday party he was given in March by the people in a different work area. They went all out and he received cards, gifts, and balloons. The only problem was that his birthday was in December. He had been in Texas during his birthday but had convinced everyone that it was in March so he could still have a party.

John: Larry was really a good choice to be the first member of the enclave. He is so outgoing that you can't help but like him as soon as you meet him. This really helped him be accepted by the co-workers.

Larry first went from the enclave to the wave solder area. I think it took 15 minutes of instruction and he was off and flying. This really surprised me. I had anticipated quite a bit of a hands-on, intimate training relationship over a period of time. He was amazingly successful in a short amount of time. There are two wave solder lines with people catching boards as they come out of the machine and pulling tape off of them. I knew this was a successful placement when one day I just happened to be walking by and noticed that one line was getting behind in its work. The boards were beginning to stack up. I saw an individual from this line come over to the other line and say, "Can somebody come over and help us?" Larry, being the guy that he is, said, "I'll do it." I was interested to see the reaction. It was, "Great, come on over." So not only was he willing to offer his support, they were willing to accept it.

Hand insertion was an area we had targeted as a potential placement site, but we were having a hard time working out how to do the training. There are many differently shaped parts that have to fit into small holes in the circuit boards, and they have to be the correct holes. Many of the parts are directional, but the direction indicators vary from part to part. One day the wave machines were shut down early for some maintenance. In situations like this, workers are normally loaned out to different areas to help out those areas. Larry was sent up to hand insertion, without any of our regular support people being notified. I found out about it the next day when hand insertion asked if they could use Larry. I said that we were thinking about it but weren't sure how to

provide the training and support for their area. They replied, "Don't worry about it. He did just fine yesterday!" This really showed me that often the limitations that are put on these folks are the limitations of our creativity, not their ability. Larry has worked successfully in hand insertion for over a year.

> *Editor's note:* Larry was reported to have an Intelligence Quotient of 43-50 and an Adaptive Behavior Scale Verbal Ability Score of 11. He was 23 years old at the time of the studies. Larry communicated in one- and two-word utterances consisting of English and Spanish words.

Stewart

Wendy: The first day Stewart arrived at NEC America, Inc. he needed to be physically assisted with everything. He made no eye contact and his body would go limp when he was asked to do something. He showed no response except to walk when guided. Over time he began to show an awareness of his surroundings and began to make eye contact with some people. He required intense one-to-one physical assistance to learn new tasks. He needed help with all of his routines, including the bathroom. Stewart had a lot of medical problems that gave him trouble. He was severely allergic to lactose and his diet had to be monitored closely. He would come to work with head colds or infections and whenever he sneezed he needed help to clean himself up. He soon learned to use his handkerchief. While working at NEC America, Inc., Stewart was found to have an ulcer, a hemorrhoid the size of a grape, and a chronic ear infection that had been severely infected for months.

Stewart was very different from Larry because he required different communication methods, needing continuous hands-on training, and was unresponsive to people. He frequently was sick. Most people at NEC America, Inc. kept their distance from Stewart but he also made a few friends. We taught Stewart more sign language and worked with him to use a communication board to increase interactions with others. He could make my day by just laughing or by looking at me directly in the eye.

During Stewart's time at NEC America, Inc. he did make tremendous strides. Once he learned a job, he had it down. He began to use some signs and also began to show some confidence. After he learned jobs, many times his productivity doubled! He worked on machines that people said he could never operate safely. It was something to see Stewart working on an integrated circuit preparation machine with his blue jacket on and the work flying. Just another impressive NEC America, Inc. assembler!

After Stewart had been working successfully at NEC America, Inc. for a year or so he began to have more problems, such as fecal and urinary incontinence, constant problems due to the foods he was eating at home, and stripping his clothes off at work. We had discussions and visits with his doctor, conversations with his mother, and meetings with his case manager. OESCo and the county case management had two nutritionists go to the home to evaluate his diet. Stewart, his mother, and I attended classes begun at Pacific University with a communication specialist . A home skills instructor was funded by the county and two male trainers at work were hired to attend to his bathroom needs. During this time a medical leave was given to Stewart to help resolve all of these problems. The problems continued beyond Stewart's, OESCo's, or NEC's control and he was eventually placed in an activity center program. It was a very sad and disappointing day for me. I learned a lot from Stewart and will always remember him fondly.

John: I was shocked when I first met Stewart. He was the total opposite of Larry. He was totally nonverbal and everything had to be done for him. He couldn't walk through a door by himself! 'I could not believe that he would be able to work in our environment. The fact that he was nonverbal and nonresponsive made it very hard for the co-workers to relate to him.

Stewart required lots of intense support at the beginning of his employment with us. But over time, he demonstrated that there were jobs that he could do independently and still meet our strict quality requirements.

The fascinating part of having Stewart on the team was to watch his development over time. His signing vocabulary increased, he responded to co-workers and me, and he became independent with his locker routines and coming onto the work floor. It was obvious that Stewart loved to work. On one occasion he had to leave work early for a doctor's appointment for his ear infection. Even though his ear hurt like crazy, Stewart wanted to stay at work. He had a job to do!

I do not consider the fact that Stewart is no longer with us a failure. Stewart made such progress while he was here that you would not have recognized him by his behavior if you hadn't lived through the changes with him.

> *Editor's note:* Stewart was reported as having an Intelligence Quotient of less than 10 and an Adaptive Behavior Scale Verbal Ability Score of 0. Stewart was nonverbal and deaf with limited sign language ability. He was 21 years old at the time of the studies.

Sam

Wendy: Sam is very devoutly religious and is probably one of the kindest people I have ever known. He is very soft spoken and polite. When Sam first came to NEC America, Inc. he needed support in returning from breaks and lunch on time, increasing his work output, and initial close training on job tasks. He learns very quickly but is slow and methodical in his work. He is very neat and organized and takes great care in the quality of his work. When Sam finishes a job you know you can depend on it to be within NEC's specifications, and that it is ready to move on to the next stage in the process.

Sam has an excellent vocabulary but is quite shy and needed some help meeting people and speaking up so that others would listen. Sam can become offended easily by others. He might stew about it without ever telling anyone he dislikes something. We worked with him to say what was on his mind.

Sam is a severe diabetic and needs to be watched closely for insulin reactions. He often needed extra breaks to have some juice. He began working half days because of his medical condition. There were several incidents of masturbation that occurred at NEC America, Inc. after Sam had worked there more than two years. According to his doctor, they were directly related to his diabetes, and when his break time was changed he no longer masturbated.

Sam was also found to have severe sleep apnias (periods of time during sleep when breathing stops). Tests showed apnias of up to a minute and a half in duration, with 700 occurring during a single night. This greatly effected his life. His response to others, as well as his work output, slowed down. Sam began sleeping with a machine that forced air into him via a mask. The mask created complications itself with sores and infections around his mouth. Eventually Sam needed gum work done because of the mask. Sam also had surgery on his palette to try to alleviate the apnias. After his sleep apnias is under control, Sam will also need heart surgery due to an increase in the size of a hole in his heart. On top of all this, Sam recently underwent carpel tunnel surgery on his right wrist and needs to have the same surgery on his left wrist. Sam is amazing because in spite of all of his medical issues he continues to work hard and has doubled his production rate since he began work.

John: Dependable Sam. If you need anything done neatly, give the work to Sam. It may not get done in record time, but it will be top quality. Sam even eats neat. Everything in his lunch sack must be arranged just so and there is a very specific order in which it must be eaten.

I don't think there was any particular reason that we didn't target Sam to move out of the enclave early on. I think it's more that we were planning on having some supported employees in component

preparation and Sam was doing a good job there. He's had a number of medical issues that he's been battling off and on ever since he came to us. It seemed easier to have him work in component preparation, where he had many jobs, while some of these issues were addressed.

Sam is very dependable. He comes to work and we can count on him to do his job and do it correctly. In spite of his medical complications, Sam never complains.

Sam was eventually moved into the surface mount board preparation area, where he worked successfully for about nine months, and then he was moved into the warehouse. He can now perform successfully in three departments.

> *Editor's note:* Sam was reported as having an Intelligence Quotient of 26 and an Adaptive Behavior Scale Verbal Ability Score of 15. Sam was 20 years old at the time of the research studies.

Karen

Wendy: Karen is a very energetic woman who loves working at NEC America, Inc. and adds a lot to the company. Karen initially was very excitable and easily distracted. She was a real training challenge and required intense one-to-one physical assistance over a long period of time to learn all her job responsibilities. She also required full assistance with caring for her menstrual cycle. When training on the job, her movements were quick and she could damage parts in seconds. You could not take your eyes and/or your hands off of her for an instant. We worked on her quality constantly. Karen would scream often, especially during training. She would also yell out a few phrases, such as "Momma" and "go for walk." She signed frequently but would add her own variation to the signs, which I referred to as her New York accent. She used to run down the production floor without looking up and would often grab, hug, and goose strangers, especially men.

Once Karen learned a job, she could do it with great speed. Her production rate rose dramatically during her first year. She is very dexterous and can work rapidly on very small, detailed components. Karen is very sincere in regard to her co-workers as well as her work. Her energy level is infectious, and she has a lot of compassion for people. She can add to any area just in terms of the morale she can build up within people.

John: My first impression of Karen was, "This is going to be a challenge!" Karen was distracted by anything and everything, particularly if it was shiny and colorful, which describes 85% of the components she was to work on. She also has the habit of looking everywhere but where you

want her to. To stand back and watch her work, you get the impression that she can't be performing. But let her miss a day of work and the group is complaining loudly about how far behind they are because they have to do her work also.

Karen was the first person we moved out (of the enclave). We were bringing jobs to her from other areas into component preparation. It ended up that her greatest skill set was related to rack assembly, so we said, "OK, rather than bring the work to her, why not bring her to the work?" We did some initial job redesigning and had the department support person sit real close to her. That person would set up a job and when Karen was done with it the support person would tear that down and get material to set up another one. That seemed to be a distraction. We ended up developing a daily job concept, so material for all the jobs could be set up ahead of time. She can get the material, perform the task, and when she is done she puts it back on the cart and takes materials for the next task. That really reduced the amount of time that a support person had to be available.

There were some tasks that we felt she was not capable of learning. We thought that she would never be able to use a torque driver. Within two weeks of joining her new group, she was using a torque driver and her overall productivity had improved dramatically. I believe that her new environment with only nondisabled co-workers was a significant factor.

Karen is now more or less on her own and she's done wonderfully. She's part of the team. She keeps a real positive mood in the area and the whole attitude of the group changes when she is gone.

> *Editor's note:* Karen has limited verbal ability and communicated primarily in vocalizations and some manual signs. She was reported as having an Intelligence Quotient of 30 and an Adaptive Behavior Scale Verbal Ability Score of 3. Karen was 21 years old at the time of the studies.

Jay

Wendy: Jay is extremely inquisitive and observant. He has a thirst for knowledge that seems insatiable. Jay needed one-to-one training to learn his jobs. There is a variety of supports needed to help Jay on his job. He has been on programs to improve his work rate and quality, and to keep his temper in check. Jay can get very frustrated at times and has shown such behaviors as pulling his hair, biting his hand, pinching himself, crying, taking machines apart, trying to damage parts, and hitting himself or others.

Once he learned tasks, his work quality and productivity were worked on. His productivity more than doubled from January 1988 to February 1990. He picks up very quickly on all routines. He has made many friends and can always get his message across in conversations, even with his limited verbal skills. He also is very adept at sign language. Jay has high blood pressure and his diet was monitored while at work. He had a tendency to eat vast amounts of food with a lot of salt.

He is always learning more about NEC America, Inc. and its various departments and processes. Jay takes a lot of pride in working at NEC America, Inc. and is a dedicated employee. He has many friends there and is always ready to make more. He has a good sense of humor and is a lot of fun to work with.

John: Jay is a power lifter. He can lift 200 lbs. over his head and his coach says he could lift 300 if he had a little more coordination! Jay communicates primarily with gestures, yet this hasn't impaired his ability to make friends. He seems to be able to zero in on the weight lifters and has made some lasting relationships. He stops by and chats with security when he comes in and at breaks. He's gone fishing with one of our security guards and let everyone know about all the fish he caught. Jay can be fairly stubborn and he sometimes won't listen to the word "no." Generally this can be dealt with by spending a little time reasoning with him, then he comes around.

Of the people that we've moved out of the area, Jay has been the biggest challenge. He began working in panel assembly and had to learn some new skills. He started using a soldering iron, putting on some plastic straps that need to have the end melted. We had him go through our company solder training class taught by our training department. He's had trouble picking up on some of the new skills that he's had to learn and speed has been an issue. Panel is a fairly high-volume production line area, so lack of speed impacts the entire area. He has some buddies in the area, but I think there are some folks there that are not very receptive to his presence. There has been friction between Jay and some of his co-workers. This was a case where I specifically requested help from OESCo. I needed to call in the technical assistance and they've been able to spend the hours with Jay that we just couldn't spend. It got to the point where Jay was keeping up on a number of tasks, and interestingly enough, as he became more successful, he was happier about being in the area.

Jay just recently moved back to the component preparation area after working in panel for one year. He can now work in component preparation, hand insertion, rack assembly, and panel assembly.

> *Editor's Note:* Jay communicates by using gestures and one-word utterances. He was reported to have an

Intelligence Quotient of 35 and an Adaptive Behavior Scale Verbal Ability Score of 3. Jay was 21 years old at the time of the studies.

Theresa

Wendy: Theresa is very friendly and interested in others. She is very family-oriented and has a genuine interest in her co-workers, their families, and their work. When Theresa is excited over someone or something, her entire face can light up. She expresses joy easily for others.

She works very hard on her job and is a valued worker. She can work quickly and still maintain her excellent quality. Theresa needed some physical assistance when first learning her jobs. She usually picked up on them quickly but needed some help with increasing her work rate. Her productivity rose about 46% from June 1988 to February 1990. Initially her quality was also an issue. She enjoyed running her fingers through parts or pouring them from bin to bin. This could damage parts very quickly. Coming back to work after breaks and lunch was also something Theresa worked on regularly. She would wander from her work station and go visit with other people. She needed a lot of support to stay at her desk and continue working while she visited with others. She set several goals for herself to work toward while improving her quality and work out put. At one point she earned enough extra money to buy herself a water bed!

John: It was pretty easy for Theresa to be accepted by her co-workers. Her communication skills and the interest that she has in her co-workers allowed her to fit right into the team atmosphere.

Theresa is working in board preparation now and is doing a marvelous job. She's really at 100% productivity at things like the riveting machine and doing taping jobs. There are two board preparation areas and she works back and forth between them as the work necessitates. This is natural; there are other people working like that. She fits very well into that. In terms of support needs, they are probably minimal. I'd say that she really just needs someone to remind her occasionally to get back on-task, but she's doing a real good job. She's been carpooling with one of our employees here now.

Editor's note: Theresa communicated by speaking in sentences. She was reported as having an Intelligence Quotient of 34 and an Adaptive Behavior Scale Verbal Ability Score of 13. Theresa was 23 years old at the time of the studies.

Peter

Wendy: Peter was a very shy man who took a bit to warm up to new people but once he did, they had a loyal and devoted friend. Peter did not like crowds and would become very nervous when in one. Peter was very difficult to understand initially when he talked. We had him bring in pictures from home and from his newspapers to help him initiate conversations. Peter needed some intense initial training on specific job tasks, but once he learned what to do he could be very independent. He needed help getting to work on time after breaks and lunch and often would come in to work and begin laughing loudly and excessively. He liked working at NEC America, Inc. and added laughter and enjoyment to the lives of the people he worked with.

Although he was shy, he developed numerous friendships at work. Most of Peter's needs related to breaks, lunch, and to infrequent happenings at NEC America, Inc. At first he always sat at a very small table, alone if possible. If Peter was sitting at a table and too many people joined him, he would leave. Almost a year after Peter began work, he asked me to join him at a lunch table and he introduced me to four of his new friends.

Any time there was a party or a meeting, Peter would either become sick or would run away from the meeting. Slowly he began to join others. In large meetings he began to participate by standing at the back by the door. Eventually he came in and sat down for short periods. It was wonderful when he actually came to the NEC Amercia, Inc. Christmas party. He stayed more than an hour for dinner and finally jumped up and ran out, saying he was ready to leave! I know he had a great time because he talked and laughed all the way home.

Peter was only able to work half days because of physical limitations. He had diabetes, some arthritis, and incontinence on a few occasions. We had to give him glucose many times for his diabetes. Later he had frequent unexplainable seizures as well as complete blindness in one eye and partial blindness in the other. His hands would spasm and he could not hold onto components. His illness became more serious, and in 1989 he died. I heard the news at work. I went to the bathroom to get myself together and I found three other NEC America, Inc. employees crying over Peter. Every department at NEC America, Inc. collected money for flowers. We had enough money to give a huge floral arrangement and donate about $200 to the National Diabetes Association. He was an important person to many at NEC America, Inc. and has been strongly missed.

John: By the time that Peter started working with us, we had pretty much figured out that these folks are individuals with wants, needs, and desires that are the same as our own, so Peter was pretty much accepted

as just another new person in the area. Peter's laughter had a positive influence on the area. His biggest joke was to come back from lunch five minutes early and then laugh because he was making money while everyone else was still on a break. Even his medical problems had a way of bringing out a positive response from people he didn't even know. One day while sitting at a table by himself in the lunchroom, Peter went into shock related to his diabetes. None of the support people were in the lunch room at the time. Two people from another table sprang into action. One of them supported Peter to keep him from falling on the floor while the other ran for help. One of the support folks administered glucose and he seemed to return to normal. The two people who had helped him moved to his table so they could watch him and make sure that he was alright. These people had never met Peter before. They called me the next day, just to be sure that he was OK.

It was a very sad day when we heard that Peter had died. The outpouring of sympathy from all areas of the company gave testament to the impact he had on all of our lives.

> *Editor's note:* Peter communicated by speaking in short sentences. He was reported as having an Intelligence Quotient of 33 and an Adaptive Behavior Scale Verbal Ability Score of 9. Peter was 22 years old at the time of the studies.

Julia

Wendy: Julia is the eighth person with developmental disabilities to join the NEC Amercia, Inc. work force. Julia needed ongoing physical assistance on all of her job tasks. She has some right-side displasia and has trouble using her right hand, fingers, and foot. Some training modifications had to be made for her to do certain jobs. There were times when she seemed almost independent on a job and then other days where she seemed completely confused. She is on medication for grand mal seizures.

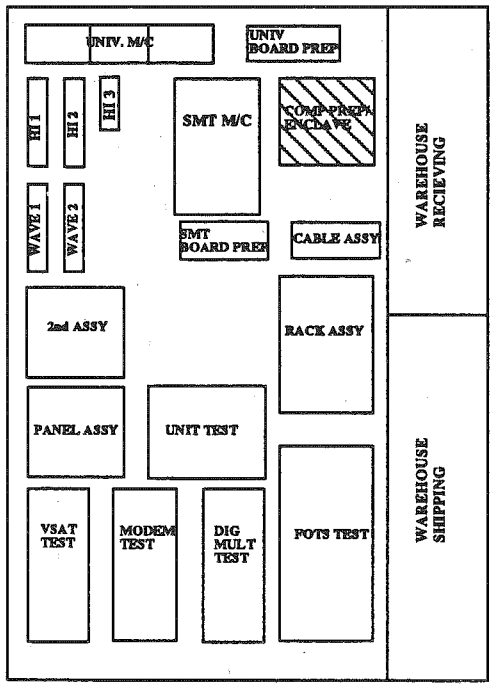
Julia needed assistance in the bathroom and intense one-to-one physical assistance during her menstrual cycle. She also needed a great deal of assistance with her routines at her locker and during lunch and breaks. She was being trained daily on taking her medicine at lunch and on going through the cafeteria line to get her own meal. Initially, just finding her way to the component preparation area was a large obstacle. Julia spoke a mixture of Spanish and English, which made it very hard to communicate with her. We tried pairing words from both languages during training, but it seemed to confuse her more at times. She could say "shut up" very clearly and loudly.

She does enjoy being in groups of people and loves looking at the pictures people bring in. She was invited to several baby showers and other company outings. Julia has a warm, heartfelt smile, and huge dark eyes. She is often silent and intent upon her work, yet always aware of the people around her. She enjoys visiting with people and can add a lot of life to a conversation if she thinks something is funny. Julia seems to get a lot of satisfaction from her work and having a job well done.

John: Julia has been one of the biggest challenges for this program. She was in component preparation for three years and was still in training over 50% of the time, on jobs that she had been doing since day one. This was a big concern for me because she was requiring too much support time, with not much return, and it detracted from the support needs of the others. We finally had to sit down and get serious about her productivity and quality. Our feeling was that either we had not been training her correctly, we had not created the right work environment, or her job skills did not meet the task requirements. In a few months the product that she had been working on was going to be phased out. It was time to come up with a solution. After assessing her job skills, we started looking throughout the manufacturing process to see if we could find a match. Eventually we settled on the wave soldering area as a place to do a trial placement. She was doing the entire job within one day and has required almost no support since she has been working there. She feels better about it too. She has let us know that she doesn't like to come back to component preparation when the wave shuts down for maintenance. It looks like we've found the right match.

> *Editor's note:* Julia communicated by speaking some English and Spanish. She was reported as having an Intelligence Quotient of 36 and an Adaptive Behavior Scale Verbal Ability Score of 7. Julia was 25 years old at the time of the studies.

Editor's Note:
Two maps of NEC America, Inc. Oregon Plant follow on the next page. They represent the areas in which employees with disabilities work. On both maps the areas employees with disabilities work in are cross hatched. In the first map the enclave is located in the Component Prep area. The second map represents the present work locations of employees with disabilities.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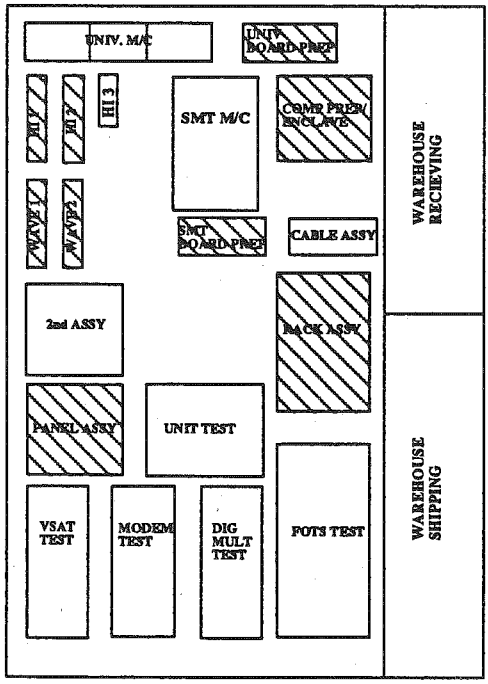
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Direct Observation of Social Interactions in a Supported Employment Setting

Keith Storey
Larry Rhodes
Dennis Sandow
Howard Loewinger
Rita Petherbridge

The purpose of this research was to study the social interactions of employees with and without disabilities in one supported employment setting, NEC America, Inc. Oregon Plant, where eight persons with severe disabilities were employed. Direct observation procedures were implemented over a one-year period to collect the data.

Previous measures of social integration have included capacity measures, progress measures, and lifestyle measures (Bellamy, Newton, LeBaron, & Horner, 1986; Mank & Buckley, 1989). Structured or guided interviews are frequently used to identify friends and other contributors to a person's social network (Barera, 1981; Wilcox, 1981), but limited response repertories and abstractions associated with identifying one's social network may result in very unreliable information (Parker, Sprague, Flannery, Niess, & Zumwalt, 1989). Direct observation of interactions has been used as an alternative in providing social network information (Galscoe & Levy, 1985), although little research has been reported in which direct observation procedures have been utilized for measuring social integration within supported-employment settings (Chadsey-Rusch & Gonzalez, 1988; Storey & Knutson, 1989). Structured direct observation procedures have the advantage of being less biased, more objective, and more sensitive to treatment effects (Hollin & Trower, 1988).

Method

Measurement of Social Interactions

The behavioral observation form used in this study included the following categories: (a) job engaged, (b) with whom the interaction occurred—area supervisor, employment specialist, nondisabled co-worker, co-worker with disabilities, or other, such as a vendor or visitor — and (c) the type of interaction—receiving, providing, or requesting assistance; receiving or providing instruction; receiving or providing social amenities; receiving or providing criticism; receiving or providing teasing/provocation; work conversation; personal conversation; other; unknown; or unacceptable behavior. (Definitions of the interaction categories are provided in Table 1.) Two of the co-workers had been

trained to provide instruction to the employees with disabilities, and when they were providing instruction they were scored as enclave supervisors. Storey & Knutson (1989) provide more detailed information on the measurement system used.

Table 1 - Definitions of Social Interaction Categories

Receiving Assistance: Receiving/getting help on a task from another person. Not correction or instruction.
Providing Assistance: Providing help on a task to another person. Not correction or instruction.
Requesting Assistance: Asking for help on a task from another person.
Providing Instruction: Giving directions, prompts, or correction to another person.
Receiving Instruction: Being given directions, prompts, or correction regarding a task.
Providing Criticism: Telling someone that he or she is doing a task incorrectly, making a mistake, or doing something inappropriate.
Receiving Criticism: Being told (in a polite way) that a task is being done incorrectly, a mistake is being made, or something inappropriate is being done.
Providing Social Amenities: Saying "Hello" or "How's it going?" or giving other polite greeting verbalizations of a short duration to another person.
Receiving Social Amenities: Being told "Hello" or "How's it going?" or receiving other polite greeting verbalizations from another person.
Personal Conversation: Engaged in a verbal interchange beyond social amenities that is not work-related.
Work Conversation: Engaged in a verbal interchange beyond social amenities that is work-related.
Receiving Compliments: Getting a positive or reinforcing statement from another person.
Providing Compliments: Giving a positive or reinforcing statement to another person.
Receiving Teasing/Provocation: Receiving negative comments (not criticism) or being the target of physical provocation.
Providing Teasing/Provocation: Giving negative comments (not criticism) or engaging in physical provocation.
Unacceptable Behavior: Behavior that is inappropriate for the work situation, whether involving interaction with others or self-directed.

Procedures for Observations

Observation sessions lasted 15 minutes. A partial interval recording system of 10-second observe, 5-second record was used. This yielded a total of 60 recorded intervals per session. A category was scored if an interaction (initiation or continuation) occurred during the 10-second observation interval; more than one category could be scored during an interval. Observers used a momentary time-sampling procedure to rate the "job engaged" category. An audio tape recorder with headphones was used to cue the observers. The employees were aware of data being collected but were not told when they were being observed. Only one employee was observed at a time, and observations of each employee occurred at different times of the day. (Figure 1 provides a scatterplot of observation times for each worker.) No employee was observed more than one time per day. No data were collected during break or lunch times. Each employee, with and without disabilities, was observed on 24 different days for a total of six hours of observation per employee. The exceptions were two employees without disabilities, Rick, who was observed on 20 different occasions before transferring to a different part of the plant, and Josh, who was observed on 21 different occasions before being dismissed.

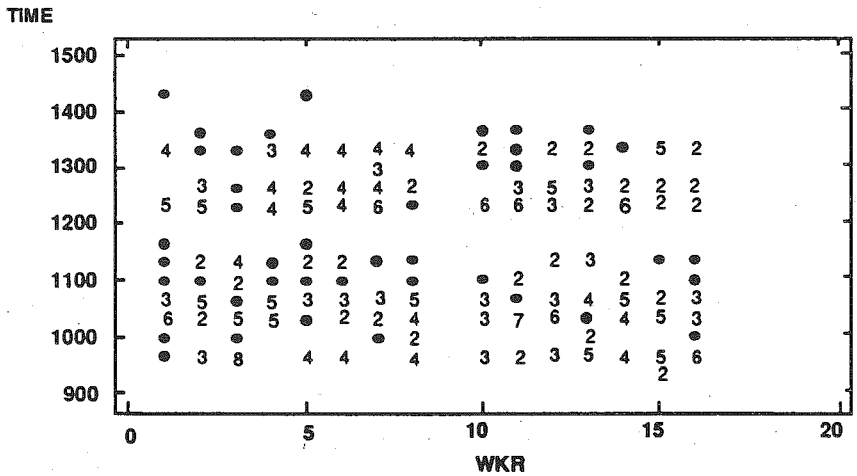

Figure 1. A scatterplot of the observation times for each worker

The first and fifth authors of this study served as the observers. The fifth author was trained by the first author, using videotapes from the job site and then using live observations at the site.

Interobserver Agreement

Interobserver agreement was calculated by having a second observer score the interactions in the same manner as the primary observer. Data collected for measuring interobserver agreement were recorded on 51 (14%) of the 353 observation sessions with at least one reliability session for each employee. An interval-by-interval agreement ratio was used to establish interobserver agreement. In this ratio, both scored and unscored intervals were included, as well as the job-engaged category. The mean was 93.5%. The nonoccurrence agreement (in which it was agreed that no social interactions took place) mean was 99.1%. The occurrence agreement (in which it was agreed that a social interaction occurred) mean was 95.5%. The occurrence plus agreement mean (intervals in which there was agreement that an interaction occurred and agreement on all categories) was 78.0%. Kappa was also calculated and found to be .88.

Results

The data for the interaction categories and the "interactors" categories (with whom the interactions occurred) represent percentages of observation intervals (each interval equal to 10 seconds of observation time plus 5 seconds of record time). These percentages were obtained by counting frequencies of occurrences of each category, then dividing by the total number of observation intervals and multiplying that number by 100. For example, if an employee is observed engaged in work conversation 10% of the time, it means that out of 1,440 observation intervals in the 6 hours that most employees were observed, 144 of these were coded as work conversation. Since proportions were not calculated on the same number of observations, and, consequently, may not represent a linear comparison, the proportions were transformed using an Arcsine transformation (Cohen, 1977). The Arcsine transformation is a data-smoothing technique used with comparative proportional data obtained from unequal Ns.

The data for the size and make-up (number of workers with and without disabilities in network) of the social network represent simple counts. Figure 2 represents the number of employees with and without disabilities in the social network of the two groups. For example, a network size of 10 means that during the 1,440 observation intervals, the employee was observed as having interacted with a total of 10 different individuals. Of those 10, 4 may have been employees with disabilities, while 6 were nondisabled.

Figure 3 displays the overall and individual means of each category of interaction and interactor. It is obvious from Figure 3 that important differences exist in the patterns of social interactions when comparing employees with and without disabilities.

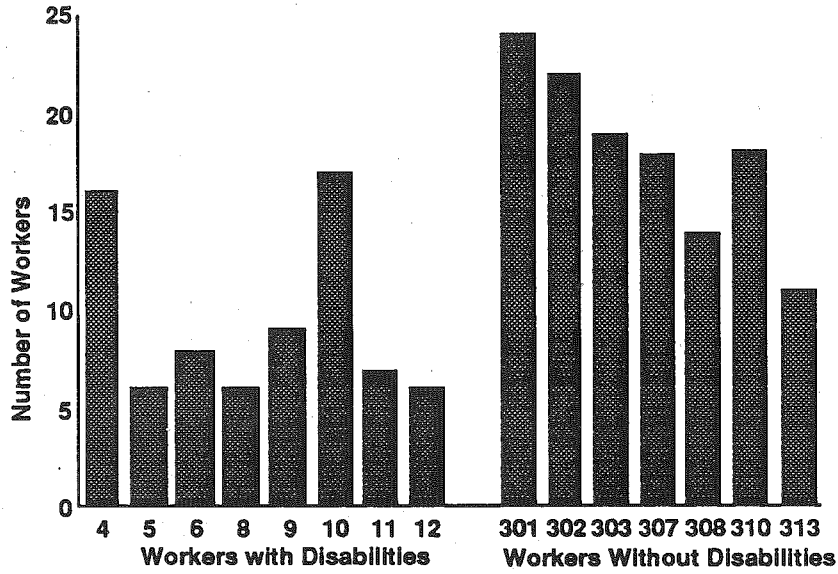

Figure 2. The number of employees with and without disabilities in the social network of the two groups

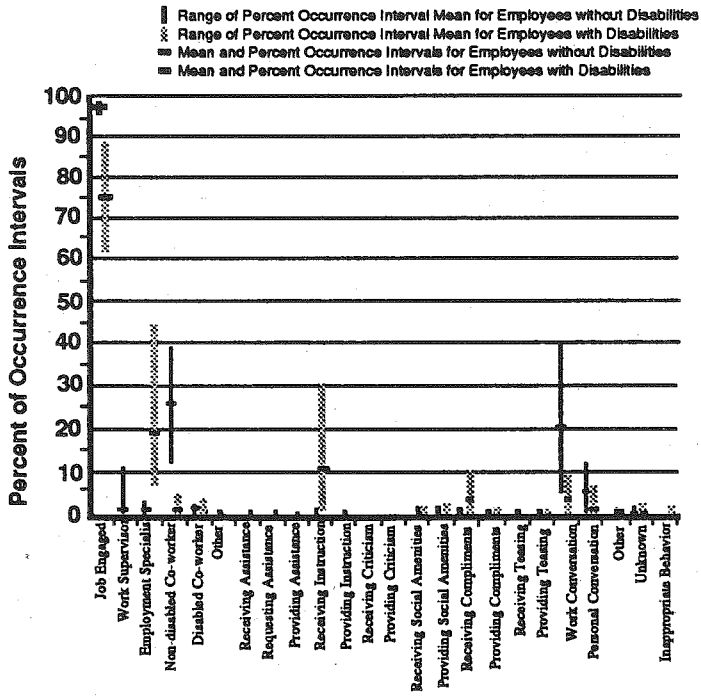

Figure 3. The combined percent of occurrence intervals for all employees with disabilities and all employees without disabilities

To test for statistical significance, several inferential tests were conducted, with the employee group (disabled or nondisabled) as the independent variable. For the interaction categories, the dependent variables were divided into "Training Interactions" (assistance, instruction, criticism, and compliments) and "Social Interactions" (social amenities, teasing, conversation, other, and unknown). The variables "receiving assistance," "requesting assistance," "providing criticism," "receiving criticism," and "inappropriate behavior" were dropped from the analysis because of insufficient data. It was necessary to divide the interactions into two groups because no more than seven dependent variables (interactions) could be included in each multivariate analysis of variance. (The number of dependent variables should be no more than half the number of subjects, and there were 15 subjects.) The six interactor categories (no one, work supervisor, employment specialist, nondisabled co-worker, disabled co-worker, and other) were analyzed together. The dependent variables "job engaged" and "network size," which are logically different from the interaction and interactor variables, were analyzed separately with univariate T-tests.

A separate MANOVA was performed on each of these two groups of interactions, as well as on the interactor variable. Because there was only one independent variable group (coded disabled or nondisabled), this MANOVA was equivalent to the Hotelling T2 statistic. The test statistics that result from a MANOVA (Wilks' Lambda, Pillai Trace, Hotelling-Lawley Trace) all produce equal F values in a Hotelling T2 analysis. For the training interaction, MANOVA $F = 6.196$; for social interactions, $F = 18.114$; while for the interactor MANOVA, $F = 25.576$ (degrees of freedom = 6 and 8 for all three). Since the groups differed significantly on all three MANOVAs at $p <= .01$, follow-up tests in the form of discriminant function analyses were then conducted to determine which dependent variables contributed most to differentiate the groups. Effect size was also calculated for each dependent variable, since with a small number of subjects (15), effect size may be a better indicator of the importance of a variable than its statistical significance (Friedman, 1968).

In a discriminant function analysis, the standardized discriminant function coefficients (also referred to as the standardized estimates of effect, or Beta weights) are the best indicators of the relative importance of the individual variables in differentiating the groups. Variables with larger Beta weights are more reliable predictors of group membership. Looking at the Beta weights (see Table 2), it appears that for the category of training interactions the particular interactions that were most important were receiving instruction, receiving compliments, and providing compliments. For the category of social interactions, work conversation, personal conversation, and other were most important. This corresponds with the univariate F tests and their associated p values

that are produced after a MANOVA. Four of the above six interactions were significant at $p <= .01$, while $p = .015$ for personal conversation and the providing compliments interaction had an associated p value of .047 (see Table 2 for coefficient values).

The standardized discriminant coefficients for the interactor categories indicate that the variables that are most important in differentiating the groups are interactions with the supported

Table 2 - Results of statistical comparisons of interactions of two groups of employees

Variable	*Enclave Employees Mean*	*Non-disabled Employees Mean*	*Beta Weights*	*Effect Size*	*Univariate E's*
Network Size	9.375	18	1.9		
Number Disabled Employees in Network	1.875	3.429		1.15	
Number Non-Disabled Employees in Network	7.5	14.714		2.01	
Job Engaged	74.3%	97.3%		3.29	
Interaction With					
No One	78.08%	69.45%	-.334	.69	1.63
Work Supervisor	.053%	1.773%	.382	4.0	2.22
Employment Specialist	19.05%	1.24%	-.821	2.11	26.8
Non-Disabled Co-Worker	1.63%	25.7%	.902	4.75	56.6
Disabled Co-Worker	1.14%	1.40%	.231	.38	.73
Other	.05%	.44%	.619	2.07	8.08
Interaction Category					
Receiving Assistance	.23%	0%	Insufficient Data		
Requesting Assistance	.13%	0%	Insufficient Data		
Providing Assistance	.06%	.06%	.105	.21	.15
Receiving Instruction	10.97%	.24%	.758	1.63	17.5
Providing Instruction	.19%	.28%	-.181	.35	.44
Receiving Social Amenities	.57%	.42%	-.119	.2	.19
Providing Social Amenities	.24%	.17%	.024	.03	.01
Receiving Compliments	3.18%	.04%	.814	1.96	25.6
Providing Compliments	.04%	.10%	-.520	1.09	4.83
Receiving Teasing	.009%	0%	Insufficient Data		
Providing Teasing	.05%	.02%	-.158	.28	.33
Receiving Criticism	.009%	.01%	-.026	.05	.01
Providing Criticism	0%	0%	Insufficient Data		
Work Conversation	3.57%	21.18%	.797	4.56	22.7
Personal Conversation	1.27%	5.76%	.613	1.81	7.85
Other	.45%	.03%	-.628	1.17	8.46
Unknown	.84%	.91%	.059	.12	.05
Unacceptable Behavior	.10%	0%	Insufficient Data		

employment specialist, with nondisabled co-workers, and with others. The univariate F tests show that interactions with the supported employment specialist and nondisabled co-workers are significant at $p < .01$, while interactions with others has an associated p value of .014. The groups also differed significantly on the amount of time they were job-engaged ($t = -6.466$, $df = 13$, $p < .01$), the size of their social networks ($t = -3.713$, $df = 13$, $p < .01$) as well as the make-up of the networks (for both the number of employees with disabilities and employees without disabilities in the network).

Discussion

This study describes the direct observation, over a one-year period, of employees with and without severe disabilities at NEC America, Inc. Oregon Plant. The employees with disabilities tended to interact more with the employment specialist, Wendy, and their interactions involved more receiving of instruction and compliments than those of the employees without disabilities. The employees without disabilities tended to engage more in work and personal conversation with co-workers, and they generally had interactions with a greater number of different people than the employees with disabilities. However, the interaction patterns varied widely for each of the individual employees. Some of the employees with disabilities interacted with more co-workers than some employees without disabilities. The employees without disabilities had significantly more employees with disabilities in their social network than did the employees with disabilities. While the social interactions and network size of the employees with disabilities are constricted, the employees without disabilities have included the employees with disabilities in their network. The data reported here are conservative estimates on the number of interactions with nondisabled co-workers because the co-workers who provided instruction on job tasks were scored as human service supervisors.

It is interesting to note that the employees without disabilities tended to engage more in work conversation than did the employees with disabilities but that the ranges for personal conversation were much more similar, though still statistically different. Though there were statistically significant differences on many of the categories, it is not clear if many of these differences are socially significant. For example, it would be expected that the employees with disabilities would interact more with Wendy because they were receiving training and support on how to complete many of the job tasks.

One of the most interesting findings in this study is the overall similarity of the interaction patterns among the employees with and without disabilities. For example, the inclusion of co-workers with and without disabilities in social networks, similar levels of providing

assistance, providing and receiving social amenities, and receiving criticism suggest that the two groups of employees do not differ in some important ways. And while there are differences in network size, job engagement level, and the individuals with whom employees interact, the rates observed for the employees with disabilities should be viewed as being positive indicators of their involvement in the workplace. On many of the interaction categories (12 of 18), there were no statistically significant differences between the two groups. It is important to note that many of these categories occurred at very low rates. For instance, teasing (which we considered a negative interaction) rarely occurred at the worksite. It should also be pointed out that although social interactions are desirable in the workplace, excessive social interactions may also be a problem in some work environments.

This study was limited to observations of interactions that occurred during actual work hours. Breaks, lunches, and times shared with other employees outside of the workday might reflect very different patterns of interactions. It would be interesting to assess whether social networks of employees with disabilities increased both during and after work following their placement in supported employment. In addition, there was no attempt within this study to weigh or subjectively rate the quality of the social interactions. The issue of quality of interaction is essential to understanding integration. Social validation procedures (Kazdin, 1977; Storey & Horner, in press) used in conjunction with direct observation procedures may be effective in providing this information.

Other limitations of the study include possible employee reactivity and effects resulting from nonrandom selection of observation times. Attempts to control reactivity were made through attention to nonintrusive data collection methods (Haynes & Horn, 1982) and through the frequent presence of the data collectors within the work environment.

Implications for future research include the need to compare social interactions with outcomes, such as friendships and other relationships, and to compare interactions across different types of supported-employment situations. Social integration is a key component of supported employment, and if the employment situation does not provide opportunities for social interactions with persons without disabilities, then it is not an appropriate supported-employment setting. However, there is currently no empirical database or assessment instrument on which to evaluate the effectiveness of an employment setting or to increase the effectiveness of any supports provided, relative to social integration.

Further research is also needed on how to increase social interactions between employees with and without disabilities. It will be necessary to identify types of work environments that promote social interactions (Sundstrom, 1987). It is not sufficient to place employees with

disabilities in physically integrated settings. As many employees with more severe disabilities are placed into supported employment, it will be necessary to develop systematic strategies for shaping integration. As an example, in this study Stewart had the fewest social interactions of any of the employees. This may be the result of profound disabilities. Stewart is nonverbal and deaf, and he seldom initiated signing. For Stewart, communication strategies that allow interactions with co-workers without disabilities and that take place in the natural environment would be useful (Halle, 1988).

The commitment to integration that is explicit in supported employment has not been matched by the means to assess the extent to which it occurs or the strategies to promote it. The physical proximity of employees with and without disabilities that exists in many community jobs provides the opportunity *for* social integration, without the certainty *of* social integration. The results of this study document the type and frequency of occurrences of social interactions within one supported employment setting. The dimensions of integration addressed in this study do not provide complete information on the quality of the interactions, nor do they indicate whether working together in the same type of work environment produces new friendships for persons with severe disabilities. However, for persons providing support, analysis of the differences between the interaction patterns of employees with and without disabilities provides important information upon which to shape the support provided. For example, as a precondition of fading specialized support to employees with disabilities, the types and amount of praise feedback and attention should be systematically adjusted to that level experienced by employees without disabilities.

The results of this study underscore the need to recognize the outcomes of social integration. Data on such measures as communication behavior, types of interactions, frequency of interactions, social networks, and personal relationships provide important information for evaluating programs, whether the evaluators are acting as advocates for persons with disabilities, selecting employment sites, or making decisions about funding or other matters. The results also compel us to develop direct service techniques that will improve individual social integration. Future research should attend to the features of support techniques that promote positive social experiences between employees with and without disabilities.

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Grouping Patterns in a Supported Employment Work Setting: Clique Analysis of Interpersonal Interactions

Xiaoyan Yan
Keith Storey
Larry Rhodes
Dennis Sandow
Rita Petherbridge
Howard Loewinger

We all are familiar with social groups that voluntarily form at work. The beginning of college basketball season might be accompanied by a group of employees who spend their free time at work talking about the upcoming season. A freak snow storm might cause an even larger social group to begin work by trading stories about getting to work through a blinding snow storm. We refer to these groups as "social" because the way in which they share common interests is through social behavior or social interactions. These social groups are identifiable by 1) the people who make them up and 2) the topic area of common interest. These social groups can also be described as social networks.

The quantitative study of social networks is useful in revealing the patterns in which individuals form groups. Descriptions of basic social network concepts are available from many sources (Knoke & Kuklinsky, 1982; Mitchell, 1969). Usually, a social network showing a given type of interaction among a group of persons is graphically depicted by a number of points connected by lines. Each point is called a "node," representing a person. Each line is called a "connection," representing the interaction between two persons. For some directional interactions, such as smiling at someone or helping another individual, the connections will have arrows showing who provides and who receives the interaction. Each connection is also associated with a value between 0 and 1, which is obtained by scaling the observed frequency or duration of the interaction. This value is called "strength" and depicts the length and frequency of the interaction. A connection with a measured strength of 0 shows no interaction and is not depicted; a connection with a strength of 1 can be viewed as a strongest connection relative to other connections in the same network. If a person does not have interactions, he or she will be represented by a node with no connections attached. The hypothetical network in Figure 1(a) is constructed to reflect the help-providing interactions among eight persons and is directional. Figure 1(b) shows a hypothetical interaction of conversation among the same eight persons. Because conversation is a two-way interaction by nature, the network is not directional.

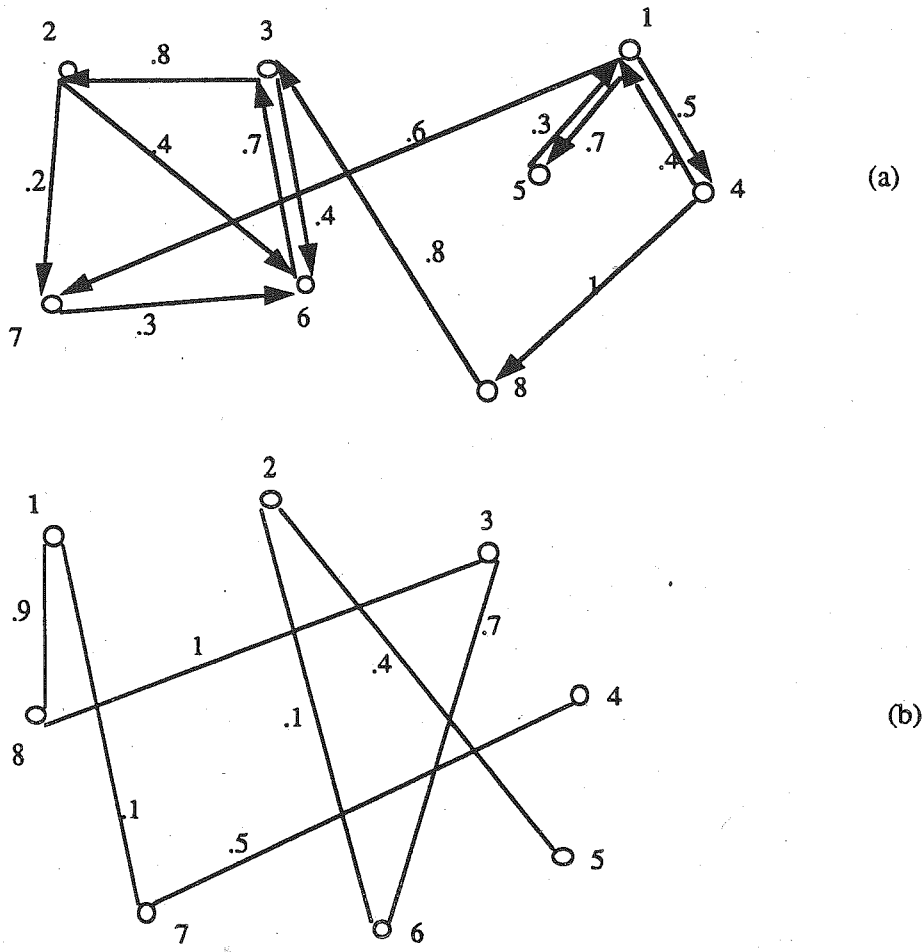

Figure 1. Examples of social networks

Examples of Social Networks

The notion of a clique in a social network was first suggested by Luce and Perry (1949). Since then, many researchers (Alba, 1973; Doreian, 1974; Peay, 1974; Seidman & Foster, 1978; Yan, 1988a) have further developed this notion and improved the clique detection algorithm.

Clique analysis has been applied to study social relationships among individuals. Using clique analysis, Hubbel (1965) analyzed relations among 67 prisoners in a correctional institution, and Laumann and Pappi (1976) investigated networks among the social elites within a small German city. Seidman and Foster (1978) studied the control relationship in a Thai village. Yee (1980) described the relationship of who-likes-whom among 21 students in a classroom. Doreian (1988) used clique analysis to

study the support relationship among 14 prominent politicians in a Midwestern county. Yan (1988a) investigated help-seeking among researchers in a university research institute. The reader can find a basic description of clique research in Knoke and Kuklinsky (1982) and a detailed description of the evolution of clique analysis and the formal definitions of clique concepts in Yan (1988a).

Although the concept of a clique has evolved, the basic idea that a clique is a "highly cohesive subset of actors within a network" (Knoke & Kuklinsky, 1982 p. 56) has not changed. In this chapter, the term "clique" means *a group of individuals in which each member is connected directly or indirectly to all others through interactions.* If the interaction is directional (e.g., interactions involve giving instructions to one another), each member has to connect to every other clique member in both directions (e.g., clique members give instructions to each other directly or through other members). Based on this definition, two cliques and one outside node (i.e., an individual who belongs to no cliques) are found in Figure 1(a). One clique is found in Figure 1(b). These cliques are displayed in Figure 2.

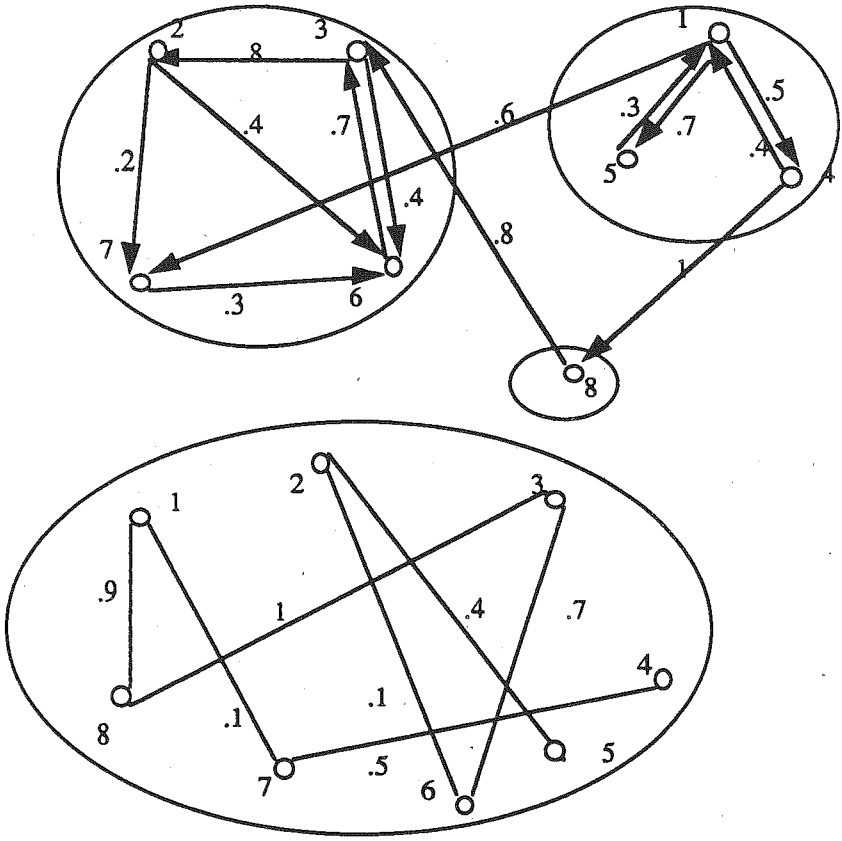

Figure 2. Cliques in the networks Displayed in Figure 1

In Figure 2, cliques detected are circled. In a typical network, there can be too many connections inside a clique to allow a clear display. Connections inside a clique can be omitted because every pair of that clique's members is already known to be connected directly or indirectly by definition. When the research interest is to identify clique members, the strength of connections between clique members and outside nodes can also be omitted to enhance visual clarity. In Figure 3, we revise the display of the cliques in Figure 2 with these points in mind.

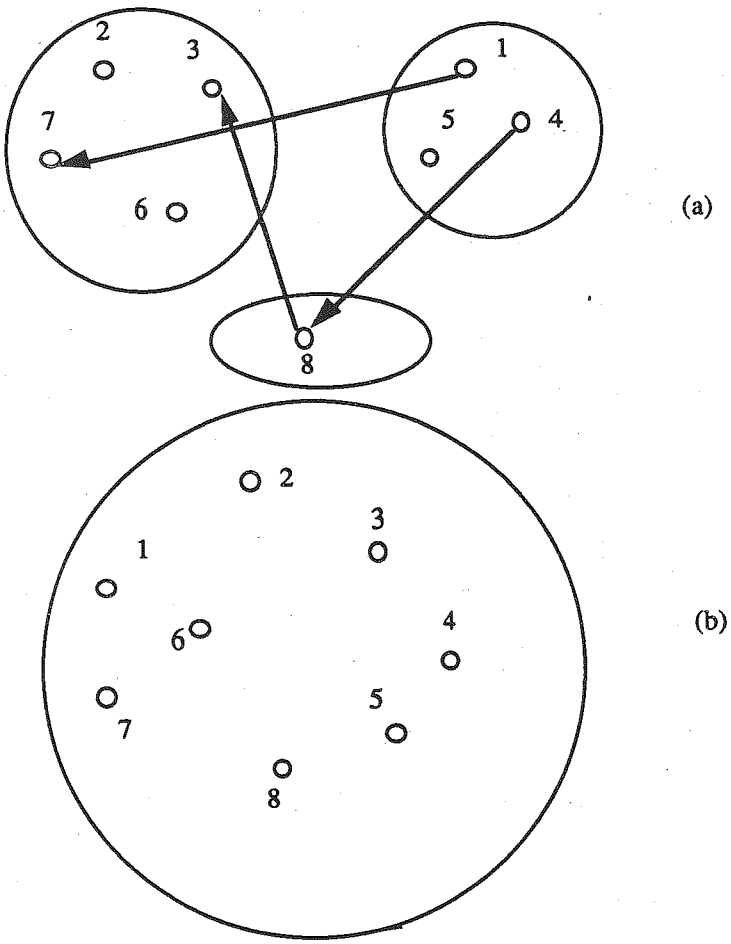

Figure 3. Alternative display of cliques in Figure 1

"Cutting" a network by using a number between 0 and 1, say 0.4, means revising the original network by deleting all the connections with a strength of less than 0.4. Cliques found in the revised network are called cliques with a detection level of 0.4. By gradually changing the

detection level from 1 to 0 and showing the cliques with different levels, the interactors' degrees of social involvement can be revealed and compared. Interactors included in cliques at higher levels are more involved in interactions than those included only in cliques at lower levels. Figure 4 shows the cliques found at two different levels in networks displayed in Figure 3.

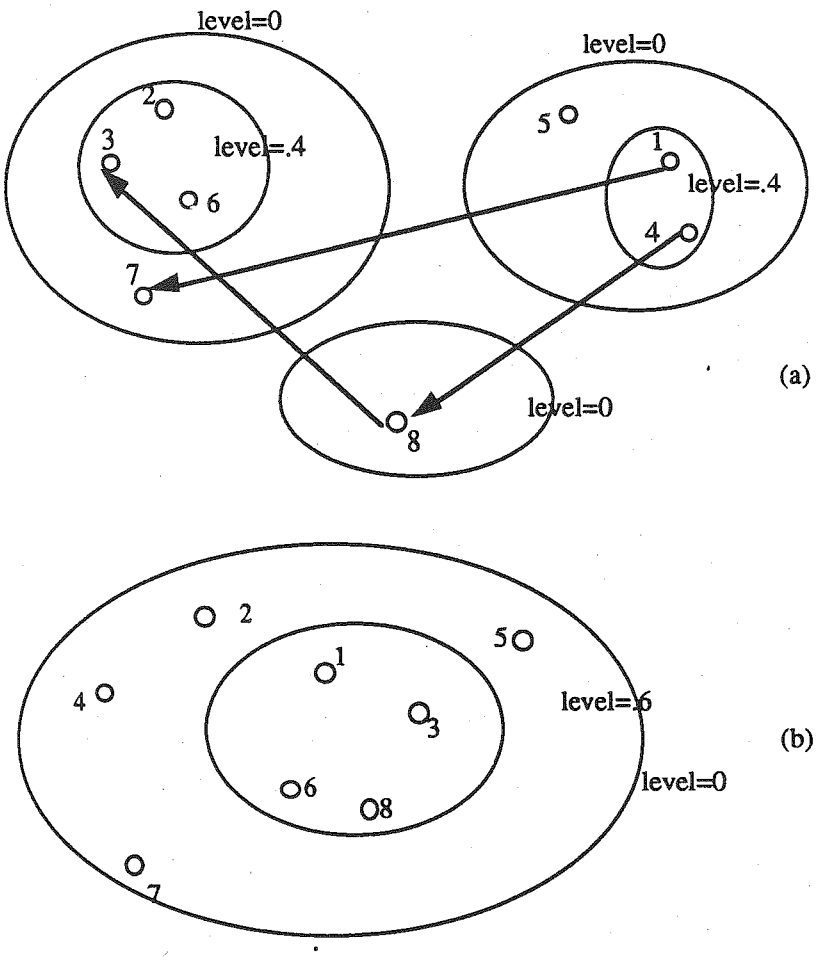

Figure 4. Cliques at different levels, based on Figure 1

A detailed explanation of the mathematics of clique analysis is beyond the scope of this chapter. However, a description of all the major steps and computations for conducting the analysis is given below.

Step 1. *Collecting data and establishing the network.* In this step, the interaction and persons involved as nodes are

specified. Frequencies and directions of the interaction between each pair of nodes during a period of time are observed. The frequencies are transformed to strength values between 0 and 1 through a scaling procedure that transforms the observed frequencies so that the strength of connection between the most frequently interacting individuals is 1.

Step 2. *Finding the distance between each pair of nodes.* A series of connections and nodes is called a path. There can be many paths connecting two nodes directly or indirectly (through some intermediate nodes). The length of a path is obtained by dividing the number of connections on the path by the smallest strength of the connections on the path. The distance from one node to another is the length of the shortest path from the first node to the second. The distance between two nodes exists only if there are distances in both directions between the two nodes, and is defined as the longest of the two distances. If there is no path at all, the distance is infinite. In this step, the distance(s) between each pair of nodes in the network is obtained through a number of matrix operations usually implemented by a computer subroutine.

Step 3. *Detecting.* By definition, the criterion for a node to be a clique member is that it is connected to every other clique member in both directions. A mathematical procedure is used to detect all node groups that meet the clique criterion in the network at each level. In this study, Clique Analysis Tool (CAT) software (Yan, 1988b) was used for the distance calculation and clique detection. The core algorithm for finding the distance used in CAT is classical and can be found in most discrete mathematics and graph theory textbooks (Biggs, 1985; Harary, 1969). Readers who want to know basics of the algorithm are referred to Knoke and Kuklinsky (1982, pp. 42-50).

Step 4. *Discussion.* In this step, one interprets results from Step 3.

The purpose of this chapter is to illustrate these procedures by assessing selected aspects of the social and behavioral impact of employment on persons with severe disabilities. In the following sections, we will present the background of the study, the method, and the results.

Background

In this chapter, we assert that one of the necessary conditions of integration is that employees with and without disabilities mix or form groups called "cliques" through social or work-related interactions at the workplace. Based on this proposition, we can ask the following questions:

1. From a sociological perspective, are there any identifiable groups among employees at the workplace?
2. Do employees with disabilities participate in these groups? If so, what is the extent of their participation? If they do not participate, then are they related to the groups in other ways? How does their way of relating compare to that of employees without disabilities?

To answer these questions, we use clique analysis to analyze data from direct observations at NEC America, Inc. Oregon Plant (Storey, Rhodes, Sandow, Loewinger, & Petherbridge, 1991).

In the following section of this chapter, we will describe the subjects, the workplace from which data were collected, and the method. The next section will analyze the results. The final section will discuss findings from the analysis and propose possible new support strategies to enhance integration.

Method

Data Collection System

The behavioral observation form described by Storey, Rhodes, Sandow, Loewinger, and Pertherbridge in the previous chapter was used to record social interactions. Because the amount of data collected on criticism, teasing/provocation, and other was very low, we excluded these categories from analysis. Five categories of interaction were analyzed. The first category of interactions was obtained by collapsing data on assistance and instruction. This category includes asking, receiving, or providing assistance, directions, prompts, and corrections regarding a task (kappa = 0.89). The second category, compliment, includes getting from or saying to another person a reinforcing statement (kappa = 0.80). The third category, social amenities, includes exchanging greetings (kappa = 0.75). These three categories are all directional interactions. The fourth and the fifth categories are personal (kappa = 0.75) and work conversation (kappa = 0.85), including verbal interchanges beyond social amenities that are either work-related or nonwork-related. These two categories do not have direction.

For each of the five categories, the number of interactions between each pair of persons was added together (in the cases of Categories 1-3, the number of interactions was added by direction), a network was established, and cliques at different levels were detected.

Results

The highest average number of interactions in any category during a 15-minute observation session was 10. This means that in these five networks, the number of sessions multiplied by 10 is the highest possible number of interactions of a given category. Based on this observation, we defined the strengths of connections in these networks as:

> strength = # of interactions/(10 x # of observation sessions).

Since this study is a one-time, site-specific study, only one network was defined for each category.

In these networks, persons with disabilities are denoted by having an asterisk extension to their names. The supervisor, Wendy, is a publicly funded employment specialist, or job coach. Persons without disabilities have no asterisk extension with their names. Refer to Chapter 2, "An Introduction to NEC America, Inc.," for descriptions of employees with disabilities. Figure 5 shows the results of clique analysis for the interaction assistance and instruction network.

In Figure 5, cliques detected at levels 0-1.0 at an increase of 0.1 are displayed. In Figure 5, we observe that at level .1, one clique was detected, which has members including the supervisor and Peter. When the level was reduced to 0, six more nodes representing six employees with disabilities joined the clique. (Recall that a level of 0 is not referring to an absence of interactions.) All members in cliques are employees with disabilities, except the supervisor, Wendy. This shows that the social interaction pattern of employees with disabilities was structurally distinguishable from that of nondisabled employees if one looks only at instruction and assistance. Nondisabled employees are not clique members at any detection levels. Note that according to the definition of a clique, Wendy also received some instruction or assistance from employees with disabilities.

Rick, Jenny, and Vance provided instruction and assistance to others but received none. Eva and the clique both received and provided instruction and assistance. Jane, Josh, and Stewart received, but did not provide, instruction or assistance. Rich was not involved in any interaction. Wendy and Peter played central roles in the cliques, showing that they were most involved in assistance and instruction.

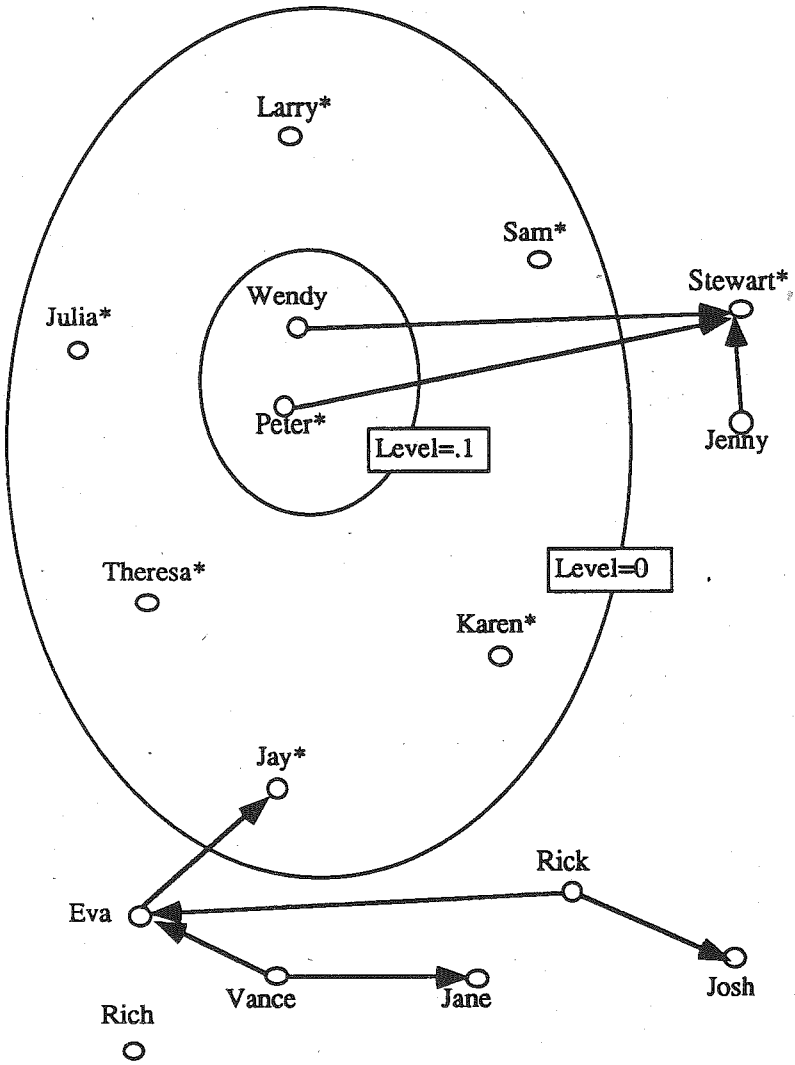

Figure 5. Cliques in the assistance and instruction network

The analysis suggests that there was enough instruction and assistance going on among the employees with disabilities to form an interaction clique, and the nondisabled co-workers' involvement was not significant enough to be considered a part of the clique activities. In terms of the relative position in this category of interaction, there is a clear structural difference between the two employee groups. The levels at which the cliques were found are low, suggesting that instruction and assistance did not serve as a major means for social interaction, and the employees with disabilities were working rather independently.

Figure 6 displays the results of clique analysis for the compliments network.

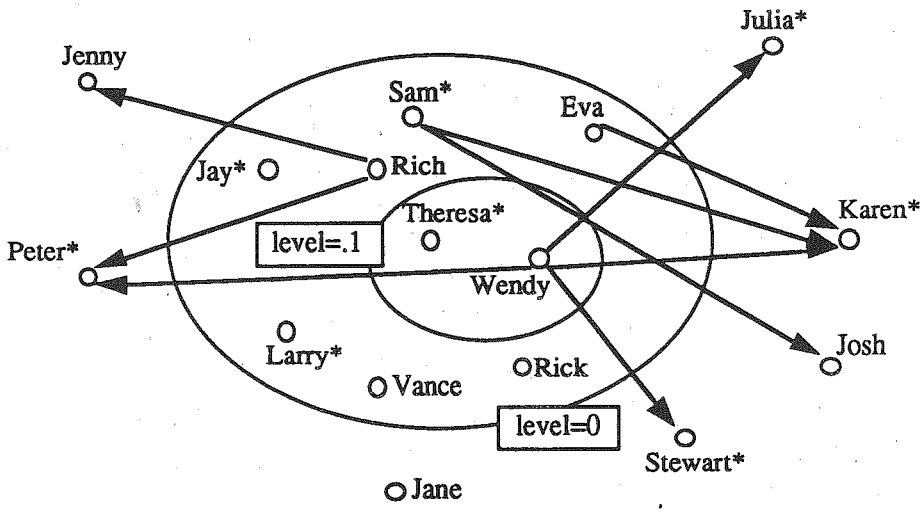

Figure 6. Cliques in the compliments network

In Figure 6, the highest level at which a clique was detected is .1. The clique involves the supervisor, Wendy and Theresa. At level 0, Sam, Jay, Larry, Rick, Vance, Eva, and Rich joined the clique. All outsiders of the clique were observed receiving compliments from members of the clique except Jane. Structurally, these outside nodes that received compliments are all interaction receivers, and the clique as a whole served as the interaction initiator. About 50% of clique members were employees with disabilities, and about 50% were without disabilities. In this network, the grouping pattern of employees with disabilities in the employment program is no longer distinguishable from that of employees without disabilities. The two employee groups are mixed together. No structural difference between the two groups can be found. It is also clear from Figure 6 that the central figures in the clique were Theresa, Wendy, and Rich. They were the most active persons in providing and receiving compliments. Wendy again played a central part.

On the whole, these results suggest that there were enough exchanges of compliments to allow a clique to be found, and employees with and without disabilities played approximately the same structural role in this social function. As reflected by the low detection levels at which cliques were found, the number of compliments exchanged was relatively small, suggesting that, like instruction and assistance, compliments were not a major part of the social interaction that happened at the workplace.

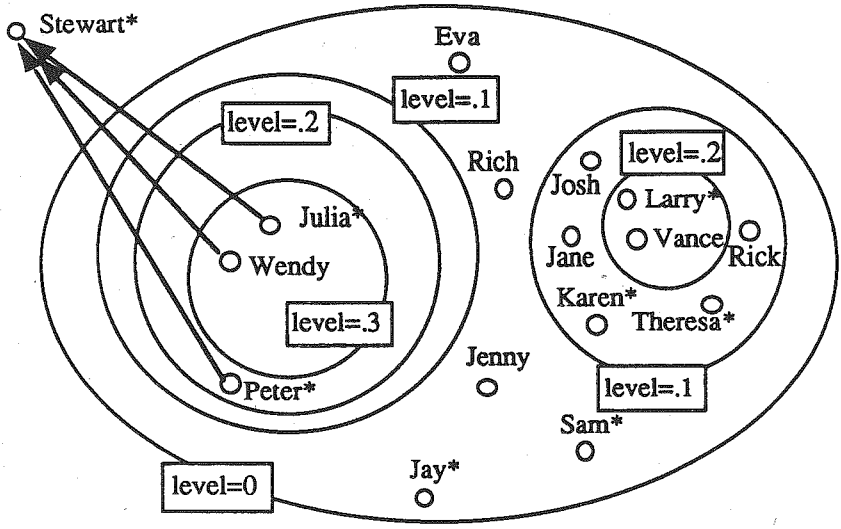

Figure 7 displays the results for the social amenities network.

Figure 7. Cliques in the social amenities network

Compared with the previous two networks, the amenity network displays a more complex structure. At level .3, one clique was detected that had two members, the supervisor, Wendy and Julia. At level .2, Larry and Vance formed a clique, and Peter joined Wendy and Julia. At .1, there's no change in Wendy, Julia, and Peter's clique, but Larry and Vance's clique expanded to four employees having no disabilities and three having disabilities. At level 0, when all connections with nonzero strengths were taken into account, the two separate cliques merged into one large clique. Everybody except Stewart was a member of this large clique. The reason Stewart was not a member is that he received but did not provide social amenities to other workers. In Figure 7, we see that Wendy, Julia, Larry, and Vance are central nodes of the cliques at different levels.

On the whole, noting that Wendy and Julia's clique was first detected at the level .3, we find that social amenities occurred at a relatively higher level as compared to the previous two categories, showing that exchanging social amenities was a more frequent mode of social interaction. The existence of this clique shows that the supervisor, Wendy and a few employees with disabilities tended to form a clique together. There was a detectable structural difference between social positions of these individuals and other employees. On the other hand, about half of the employees with disabilities formed a clique with employees without disabilities (Rick, Josh, and Jane) at detection levels 0.1 and 0.2, showing an encouraging sign of integration. At level 0, the

two cliques merge together, and all but one employee is included in the clique. The clique pattern shows that integration through social amenities was occurring among some employees with disabilities at relatively high detection levels and to almost all workers at lower levels.

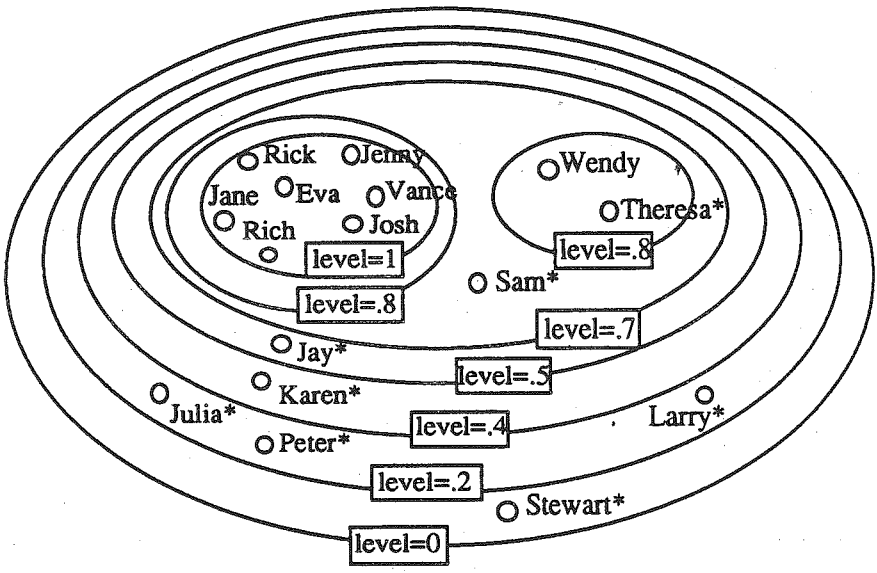

Figure 8 shows the results from work conversation.

Figure 8. Cliques in the work conversation network

In Figure 8, we find that all employees without disabilities formed a clique at the highest detection level (1.0). No employee with disabilities was involved. At level .8, the supervisor, Wendy and Theresa formed a small clique. At .7, members of these two cliques and one more employee, Theresa, merged to form a bigger new clique. As we lowered the level of detection, all employees with disabilities eventually joined the clique.

A detectable structural difference between the clique patterns of employees with and without disabilities at detection levels 0.8-1.0 is suggested by this result. About 50% of the employees with disabilities did not join the clique until the detection level was lowered to 0.2. However, this picture also shows that at detection levels 0-0.7, certain levels of communication regarding work were going on among all employees and the employees with disabilities were in different states of involvement. Comparing the levels of interaction in this network with the previous three interactions, we find that "talking about work" was one of the major interactions that occurred at the workplace.

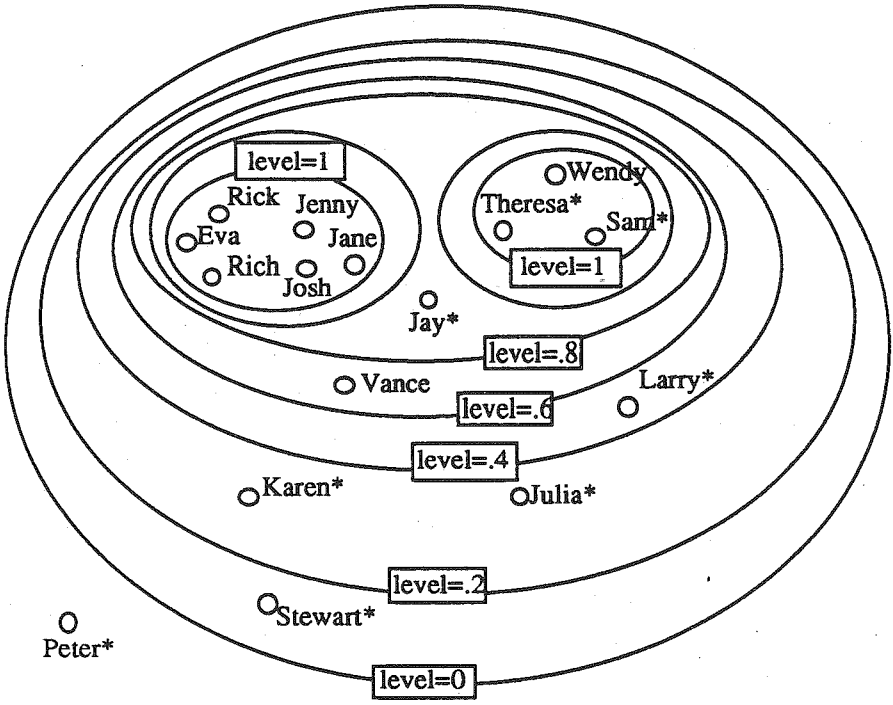

Figure 9 shows the results from the clique analysis of personal conversation.

Figure 9. Cliques in the personal conversation network

Figure 9 shows that six of the seven employees without disabilities engaged in personal conversation at the highest level (1), and Sam and Theresa formed a clique with the supervisor at level 1. When the level was lowered to .8, these two cliques merged and Jay was included. At level .6, the last nondisabled employee, Vance, joined the clique. All other employees with disabilities except Peter joined the clique as the detection level was lowered from 0.6 to 0.

Detectable differences in interaction patterns between two groups of employees are suggested by this graph. First, at high levels, employees with disabilities and employees without disabilities belonged to different cliques. Second, all employees without disabilities were involved in the clique at level .6, while at the same level, most of the workers with disabilities were still outside the cliques. As in the work conversation network, the levels of personal information exchange were considerably higher than those of the first three categories. At level 0, almost all employees with disabilities became clique members, indicating that different levels of communication existed among

workers with and without disabilities regarding nonwork-related information.

Discussion

Several limitations in the results should be noted. First, it was assumed that when a conversation happened, each of the participants spent approximately the same amount of time talking. While this may be true with some employees, it may not apply to all employees. This is a source of distortion in the analysis of the work conversation and the personal conversation networks. Second, this study was based on data collected from one particular workplace during work time. The result cannot be readily generalized to other supported-employment settings or to times such as lunch or break. Third, direct observation techniques create limitations resulting from reactivity, although attempts to control reactivity were made through the use of nonintrusive data collection methods (Haynes & Horn, 1982) and through frequent presence of data collectors within the work environment.

At the beginning of this chapter, we proposed that persons with disabilities integrated at work settings may form cliques with co-workers without disabilities. The opposite proposition is that workers with disabilities will be totally segregated and that employees with and without disabilities will not interact. In Figure 10, two sample graphic representations of clique analysis results depicting full segregation (Figure 10a) and full integration (Figure 10b) are given.

The results from clique analyses of the five interaction networks and comparisons of Figures 5-9 with Figure 10 support several conclusions. First, most interactions among employees occurred in the form of personal and work conversations. Figure 11 depicts all five interaction networks' cliques to allow some comparisons. On the left side, the levels are displayed (0 - 1.0). In a tree-like structure, a relative comparison of the "strength" of the interactions can be accomplished. In this case, strength is defined by frequency and duration.

In both networks, when the detection level was set at about 0.7 or higher, detectable differences in clique patterns between the two groups of employees were found. Most employees without disabilities formed cliques with each other, while a few employees with disabilities and the supervisor formed different cliques. However, at relatively low detection levels, almost all employees with disabilities joined the clique, and small social circles found at higher levels always merged into larger ones. At these lower levels, employees from two groups mixed together, and no structural differences were detected. Information from the analysis of these two interactions suggests that employees with disabilities were neither fully integrated nor fully segregated; they were in different states of integration between the two extreme cases. In order

for integration to improve, efforts should be made to get employees with disabilities more involved in work and personal conversations with nondisabled co-workers. One possible way to make this happen is to change the supervision strategy so that the nondisabled employees become more involved in the training of the employees with disabilities. Another is to disperse employees with disabilities so that each works alongside a greater number of nondisabled co-workers. A third is to increase the communication ability of the employees through behavioral training or the use of augmentative communication systems. Of course, what level of integration is "satisfactory" remains to be established.

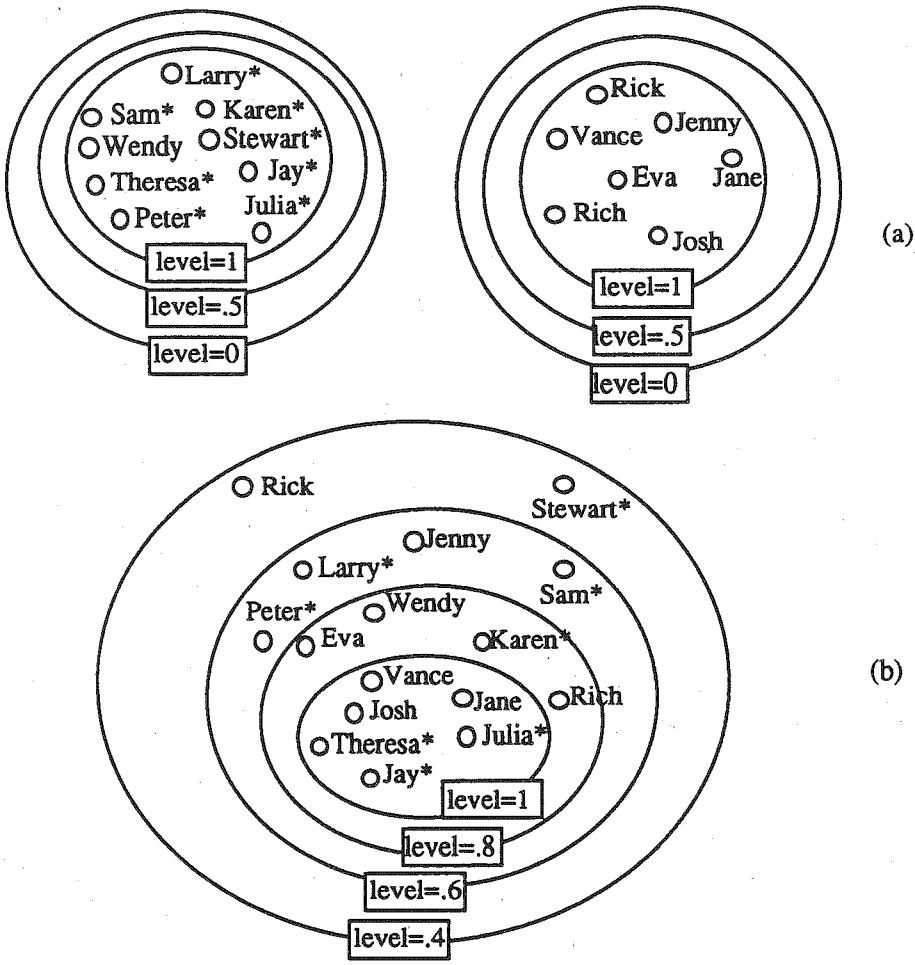

Figure 10. Two extreme cases of social integration - The top figure represents total segration; the bottom, total integration.

Second, enough interactions involving social amenities and compliments were found to form detectable cliques at low levels. Unlike the cases of work and personal conversations, the networks involving social amenities and compliments showed little detectable structural difference between the two groups of employees, demonstrating similar levels of these kinds social interactions.

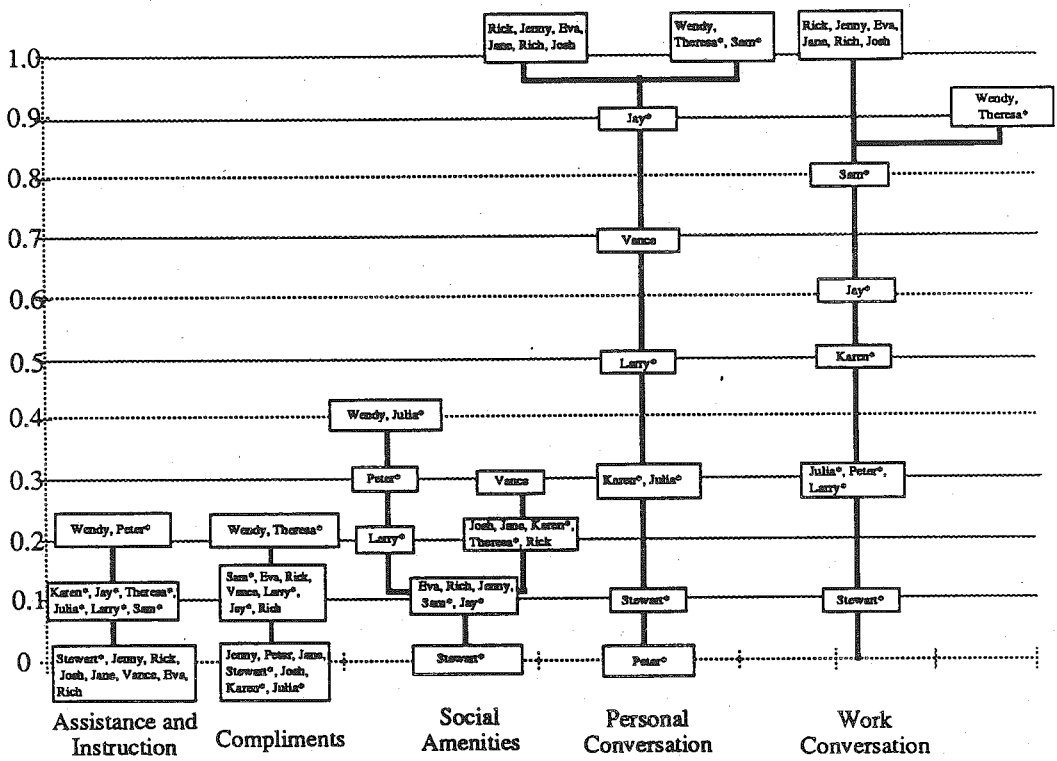

Figure 11. Tree structure of interactions

The clique in the instruction and assistance network reflects an important feature of supported employment programs—the ongoing support to persons with disabilities after they are employed. In addition to providing skill training and supervision of employees with disabilities, ongoing support also provides a certain amount of social interaction. However, an important question to ask is: From whom do employees with disabilities receive ongoing support? The clique analysis for this work setting shows that most ongoing support came either from the supervisor or from other workers with disabilities, leading to the formation of a clique among the employees with disabilities. Again, to achieve integration, it may be preferable for workers to derive most ongoing support from co-workers without

disabilities and thus form cliques with them. The assumption is that if co-workers without disabilities are more involved in training and assistance with employees with disabilities, opportunities for work and personal conversations among co-workers without disabilities will improve. This support strategy may be more difficult to implement, but it can better promote integration.

While the clique analysis reveals differing states of integration, it also sends us some warning signals. Looking at all the figures, one finds that Stewart and Peter were either outsiders in the network or interacted with others at the lowest level. This indicates that they were not integrated as well as other employees with disabilities. It is possible that the levels of integration may be largely a function of the disabled employees' limited verbal repertoires. Though social interactions do not have to be verbal (e.g., shaking hands), they usually are. While Stewart had some major limitations in communication because he is nonverbal and deaf, Peter had a high Adaptive Behavior Verbal Ability Score and could speak in short sentences. This suggests that the reasons for the relative isolation should be explored and ways should be found to improve the communication patterns of individuals like Peter.

In all the networks, at relatively higher detection levels, Wendy, the supervisor, formed cliques with two or three employees with disabilities. Most of the employees with disabilities were not included in the clique. On the one hand, this shows that a supervisor is important in providing interactions; on the other hand, it shows that the current support available to employees with disabilities cannot provide social interactions at a level the nondisabled peers enjoy, and some changes in support strategy should be considered. On the whole, if our proposition in this chapter is true, then there must be changes in interaction patterns before full integration occurs.

In concluding this chapter, we should make some comments regarding clique analysis and its applications. First, although the study described here was designed as a one-time study and all the networks were analyzed only once, clique analysis can be used by service providers and program providers across time. The results will show changing grouping patterns that reflect progress in social integration. Based on this information, service providers can design alternative support strategies to promote integration. Second, clique analysis can be used to compare integration across different industries or supported-employment approaches (e.g., individual job placement versus groups of persons with disabilities working in close proximity to each other). By examining clique patterns in these approaches, we can see which industry or program better facilitates social interactions. A strength of clique analysis is that its structures not only include the interactors but also the magnitude of interactions between them. This allows one to observe social behaviors of individuals quantitatively and in relation to

each other. Finally, clique analysis offers an additional analysis system to be utilized in behavioral assessment. Clique analysis may prove useful to behavioral researchers in many different settings, including classrooms, small groups, and workplaces.

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The Meaning of Relationships in a Supported Employment Site[1]

Deborah Olson
Philip Ferguson

A co-worker related this story about Stewart, a nonspeaking supported employee. Several days in a row Stewart came and stood before him when he came to work in the morning. Initially he said he was disconcerted by the behavior, but he joked, "I thought perhaps Stewart was looking at himself in the reflection of my bald head." He went on to say:

> I realized that when he stopped he just wanted little bit of attention and I saluted to him and then he just went over and sat down, and it kind of was a standard thing every three or four days that he'd come over and stand and I'd look up at him and smile and salute and then he'd go over and sit down and go to work. That made me get closer to him.

This story relates a facet of the relationships between supported employees and their co-workers that is difficult to capture with the research techniques commonly used in disability employment research. Relationships by their very nature are personal and subjective, complex and elusive. Framing research questions to address the "slipperiness" of relationships requires a shift in the research paradigm from one that seeks to identify the objective nature of reality to one that describes how individuals construct their own realities, in this case, how relationships are constructed between workers with and without disabilities.

Research questions with this latter perspective reflect a world view, or paradigm orientation, often called "naturalistic," "qualitative," "ethnographic," or "interpretive." For the purposes of this article we will use the term "qualitative" to refer to our research orientation.

Qualitative research emerges from two basic theoretical traditions: symbolic interaction and phenomenology. The latter is the study of consciousness and the phenomena of everyday life (Husserl, 1901), while the former emphasizes the study of meaning or symbols constructed by individuals through interactions with their environment (Mead, 1934; Blumer, 1969). Both traditions regard reality as a construct

[1]The authors would like to thank Terri Johnson for the data collection efforts that made this article possible.

rather than as a tangible entity. Both also aim to describe and understand the realities constructed by the individuals being studied.

Given that research reflects the world view or paradigm of the researcher, it seems important to understand the underlying beliefs upon which research is based. Lincoln and Guba (1985) enumerate five basic tenets of qualitative research:

1. Realities are multiple, constructed, and holistic.
2. The Knower (researcher) and the Known (subject) are interactive and inseparable.
3. Only time- and context-bound working hypotheses are possible.
4. All entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effects.
5. Inquiry is value-bound. (p. 37)

It follows, then, that research design and methodology should be consistent with and emerge from one's basic world view. A design based on understanding multiple realities, for example, would be inherently different from a design based on the belief of one objective reality. Therefore, a major characteristic of qualitative research is an evolving, fluid design of study as opposed to a rigid design. This fluidity can first be seen in the process of selecting informants for study. Rather than using a process of random sampling, qualitative research employs a purposeful sampling technique constructed to choose informants who have information to further the course of the study and to expand the researcher's knowledge base. The researcher is the basic instrument of data collection because no instrument could be designed to capture multiple realities. Data collection employs the techniques of observation and interviewing to allow the informants the opportunity to express their own perspectives, issues, and realities. In participant observation, the researcher spends time in the natural setting of the study. The researcher observes and talks with informants to begin to understand their perception and construction of reality. These observations are captured in detailed, descriptive field notes. Interviews are open-ended and unstructured, designed as "face to face encounters between the researcher and informant directed toward understanding the informant's perspectives on their lives, experiences, or situations as expressed in their own words" (Taylor & Bogdan, 1984, p. 76). In qualitative interviewing there are no "right" questions or answers. The issues emerge from the interview, reflecting the informant's own meanings and constructs. Lastly, the analysis process in qualitative research is inherently an inductive process, with themes emerging from the data rather than superimposed by the researcher using a deductive process. These basic characteristics of qualitative research will be easily

discernable in the description of the current study of relationships between employees with and without disabilities of NEC America, Inc. Oregon Plant.

There are several basic texts for those who wish to become more familiar with qualitative research, design, and techniques. Qualitative research has a long history in anthropology and sociology. Within the field of mental retardation, there is a small but growing tradition of qualitative research, beginning with Edgerton's classic study of mild retardation (Edgerton, 1967) and developing into the areas of residential services (Bercovici, 1983; Dudley, 1983), vocational training (Kielhogner, 1983), special education (Ferguson, 1987), the family life of children (Goode, 1983), transition from school to adult life (Ferguson, Ferguson, & Jones, 1988), parent advocacy movements (Jacobs, 1969), and friendships between people with disabilities and those without (Bogdan & Taylor, 1989; Lutfiyya, 1990). While little qualitative research has occurred within the area of supported employment (Hagner, 1989), it is an area of complexity and richness of detail that lends itself to ethnographic study.

Method

Data Collection

Semi-structured, open-ended interviews were initially conducted with four co-workers, two management-level employees at NEC America, Inc., two supported employees, and two parents of supported employees. Some of these co-workers worked in the same area in which the enclave was located, while others worked in surrounding areas. The two management employees were the Director of Manufacturing and the Director of Administration and Personnel. This first set of interviews occurred within a few months of the start of the enclave at NEC America, Inc. The interviews all occurred in the NEC America, Inc. cafeteria, with the exception of one parent who was interviewed in her home.

One year later, interviews were again conducted, this time with eight co-workers, one supported employee, and one parent. The parent, the supported employee, and one of the co-workers also appeared in the first set of interviews. All of these interviews occurred in the NEC America, Inc. cafeteria.

The interviews ranged in length from 20 minutes to one hour, and all were tape recorded for later transcription. All interviewees were assured anonymity.

In addition to the interviews, eight hours of participant observation were conducted on-site at NEC America, Inc. These observations provided a flavor of the worksite and a sense of typical worksite social interactions among workers at NEC America, Inc., and it provided an opportunity to corroborate data between the interviews and the observations, a process sometimes called triangulation (Patton, 1987).

The observer attempted to capture the typical rhythms of the work day at NEC America, Inc. by being present at the arrival and departure of supported employees, as well as during their lunch period and their work hours. The observations were documented in field notes completed after each observation session.

Data Analysis

Taken together, the interviews and field notes yielded some 120 pages of data. These data were coded and sorted with the help of a computer program called The Ethnograph, designed for qualitative analysis of verbal data (Seidel, Kjolseth, & Seymour, 1988). This software does not "code" the data as such; that analytic step remains the responsibility of the researchers. However, the software does allow the analysis to become less tedious and potentially more powerful because of sorting and resorting that can be done by computer.

In qualitative research the analysis begins at the point the researcher first enters the field. This on going process continues throughout the data collection and merges with the writing process. For writing purposes, however, it is easier to discuss the components of the process as if they were distinct entities. The very nature of the underlying assumptions described earlier, in fact, dictates a fluid, flexible process.

In accordance with typical procedures for analysis described in the literature (Bogdan & Biklen, 1982; Glaser & Strauss, 1967; Taylor & Bogdan, 1984), the process of coding the data began as the data were transcribed. Codes are descriptive labels that correspond to specific themes in the data. They are assigned to chunks of data that are then entered into the computer program. The computer assists the analysis process by isolating particular codes, by displaying data that are multiply-coded, and by performing other tasks that facilitate the management of prose data. Common initial codes for the co-workers in this study, for example, were Initial Reactions, Attitudes Toward Workers, and Personal History. Codes from the management employees included Initial Questions, Customer Reactions, and Getting Approval. Initial coding is typically very descriptive and concrete.

The authors coded data separately, and then compared and consolidated codes. A second round of coding then occurred, focusing on relationships among the co-workers and supported employees. At this stage some codes were deleted, some were added, and others were reformulated to reflect the on going analysis. The focus on interactions, for example, resulted in the creation of new codes characterizing different types of interactions and in the restructuring of the code Attitudes Toward Workers into distinct types of attitudes. This level of analysis goes beyond concrete description to a level of conceptualization to further our understanding of the meaning of relationships for co-

workers of supported employees. Although this coding stage is more abstract than earlier stages, it is still grounded in the data through constant referencing. In fact, it is at this point that the triangulation with the on-site observation data provided support of the analysis.

Results

Three broad themes emerged from the analysis. Two of these themes involved the relationships between supported employees and co-workers without disabilities, while the third involved the attitudes of co-workers towards the support agency staff. The relationships between the workers with and without disabilities will receive most of the attention here, with the co-worker/support staff theme being described more briefly at the end of the section.

The relationships between the workers were divided into the closely related categories of attitudes and interactions. The difference between the two categories mainly involves their level of concreteness and individual focus. The first theme consists of attitudes or perceptions of the co-workers toward the supported employees. The second theme consists of the actual interactions between the two groups.

Typology of Attitudes

The variety of attitudes and perceptions expressed by the nondisabled workers about their co-workers with disabilities influences the timbre and tone of their interactions with the supported employees. This discussion will revolve around the four major themes that emerged from the co-worker interviews: the supported employee as co-worker, as client or student, as object of charity, and as robot worker.

It is interesting to note that in the first session of interviews, co-workers expressed only perceptions about the new supported employees. In the second set of interviews, one year later, co-workers more frequently described interactions with supported employees. A second observation about these attitudes is their similarity, as well as the points of difference, with major prejudices and conceptions held by society toward people with mental retardation. Although these themes are tentative, they are interesting both for their implications for orientation of co-workers about supported employees and for their use as a framework for further research.

Supported Employees as Co-workers. Departing from common societal views of people with disabilities as incompetent, some workers without disabilities at NEC America, Inc. expressed attitudes that the supported employees have as much right to be working at NEC America, Inc. as anyone else. These perceptions found expression in

such comments as "everyone deserves the best they can do to get a job and do the best they can," and "that's what they're here for, a paycheck." Several workers discussed the job skills of the supported employees and compared them favorably with other new employees, for example, when they noted that there are some jobs that everyone found tricky to learn. Interestingly, workers were assuming during the first set of interviews, only a few months after the start of the enclave, that workers would be dispersed throughout the manufacturing area. Comments such as these were common: "I think they'll just be moved around to different areas," "I'd like to see them mixed with other groups. I wouldn't like to see an enclave just by itself...that singles them out," and "I can imagine there are other jobs that they can do. I'm pretty positive there is. But first they introduced them into our department and then they'll move them along to another department."

This expectation that the supported employees would blend in with the workforce indicated a growing "ownership" of the enclave project by NEC America, Inc. employees and an expectation that the new workers would be treated similarly to other employees. A few co-workers also noted that there were other NEC America, Inc. employees who had "special needs" or particular circumstances that required some support or adaptation. They were "just employees."

Supported Employees as Client/Student. A second theme emerging from the co-workers' perspectives placed the supported employees in the role of a client or student. In this role the supported employee is viewed as inhabiting a more passive, lower status than the equal status of co-worker. The co-workers expressed more interest in the learning process and adjustment of the supported employees to NEC America, Inc. than would otherwise be directed toward other co-workers, often commenting that they were very surprised the supported employees could learn their jobs. This may be the result of the relative newness of the enclave within NEC America, Inc. at that time. Co-workers reported that they did not know what to expect when the enclave was first proposed, and they expressed curiosity about the supported employees' capacity for learning. Co-workers also often commented on the shyness of the supported employees when they first started at the plant ("like lost children") and on how they became more outgoing and more comfortable around people. Several co-workers reported the opinion that the self-worth and self-esteem of the supported employees had increased because of their new job.

This perspective may be founded in the interactions the co-workers observed between the support agency staff and the supported employees, which reinforced the client role in their perspective. Several co-workers, for example, reported that the supported employees were never left alone, that someone was always there helping them. Some

helping behaviors that might have occurred naturally between co-workers (for example, giving them directions in the cafeteria when supported employees became confused about the location of certain items; or making sure that one supported employee took her medication at lunch) were reported instead as examples of how they "took care of" the supported employees. An interesting example of the support staff inadvertently reinforcing this client role was reported by Edith, a co-worker who was trained to train the supported employees. She told of an occasion where co-workers expressed concern about training techniques used by support staff with the supported employees. Edith was asked, "Are you doing that for a reason, or are you just mean?" She explained to them that it was a "program" for that individual. This response satisfied their curiosity and nothing more was said. Experiences such as these seemed to contribute to the co-workers viewing the supported employees as clients or students in need of supervision and the support staff as having expert knowledge to deal with the clients. The perspective on support staff as experts will be expanded upon later in this chapter.

Supported Employees as Objects of Charity. Several co-workers expressed a familiar theme about people with disabilities as "special" and in need of special treatment. As one worker stated: "They're special. We're ordinary, but they're special." Several co-workers reported the same story that another co-worker had taken one of the supported employees home and given him clothing from her family. In one co-worker's perspective, the supported employees were being treated with "kid gloves" so that they wouldn't become upset. He observed that they took extra-long breaks and he voiced the opinion that they were kept from being under any pressure. Whether or not any of these perceptions are "accurate" from the point of view of the support staff is irrelevant. The interpretations made by observing co-workers constitute their view of the supported employees.

A subtheme within this category of charity can be expressed as "they make me feel good" or "they're doing more for me than I do for them." These statements reflect a sentiment, long recognized by disability rights advocates, that charity can result in more benefits for the giver (e.g., feeling good) than the receiver. A second subtheme, however, shows an interesting and complex mix of self-interest with altruism. One worker stated it as "I want my job to mean something, you know? I want it to be something more than just prepping components." This theme requires more study, but many co-workers expressed in a variety of ways the idea that they enjoyed having the supported workers at NEC America, Inc. or took great pride in being a part of their growth as workers. The enclave seemed to change the environment and atmosphere of the manufacturing plant. "It's a nicer place to work," reported one worker.

Supported Employees as Robot Workers. One final attitude emerged from the data. Many of the co-workers enthusiastically endorsed the concept that the supported employees were there to work on menial, repetitive tasks. They saw the supported employees as being ideal for this type of work, since people with mental retardation are so amenable to repetitive tasks. The supported employees were seen as relieving the co-workers of boring, tedious jobs:

> There's a lot of real menial jobs here that are real labor intensive. Little things, like counting out the number of parts, that just take up a lot of other people's time when there's a lot of other stuff that has to be done.

While co-workers viewed these tasks as routine and boring, they assumed that the supported workers would find them challenging. One co-worker assured us that the supported employees loved these tasks: "It's a joy for them to do." It would be interesting to know whether this was the approach used when the enclave was first introduced to NEC America, Inc. or whether this stereotype just emerged from co-workers' general "knowledge" of people with mental retardation.

Typology of Interactions

Turning to the interactions observed and described by co-workers, we take a step closer to understanding workplace relationships, as well as to seeing the attitudes and perceptions expressed by co-workers dramatized in daily interactions. One way of organizing this discussion is to describe the separate dimensions that seemed to invest the interactions with their specific character. Each of the dimensions, in turn, had a bipolar structure, allowing them to be portrayed in terms of opposing characteristics. Our analysis identified four of these polarized dimensions of interactions: positive-negative, spontaneous-ritualistic, verbal-nonverbal, and hierarchical-egalitarian.

Before describing these dimensions in more detail, several general comments need to be made. First, we do not claim that all these dimensions were noticeably present in all the interactions we witnessed. Moreover, our discussion here presents the dimensions as more dichotomous than they actually were in most of the interactions we observed. For heuristic purposes, we have hardened distinctions that were often fuzzy, drawn lines of contrast where there were shadings of difference. Finally, these dimensions themselves seem to interact in ways that are not entirely clear to us. At the least, it is clear that they are not mutually exclusive. A particular interaction, for example, could be simultaneously described as positive, ritualistic, and nonspeaking.

Positive-Negative. This is perhaps the most straightforward of the four dimensions that emerged from the data. At the positive end, the dimension is illustrated by interactions that are mutually satisfactory to each party. Simple greetings, for example, describe this type of interaction:

> Dave, a co-worker who worked in the fiber optic section right next to the enclave, went out of his way to walk through the enclave on his way to lunch. He punched Julia, a supported employee, on the arm as he went by, saying, "Hi!" Julia smiled in return.

This exchange was particularly interesting because Julia appeared to be one of the more isolated supported employees; rarely was she observed interacting with anyone except support staff. Stories about her were rare in the co-worker interviews.

Positive exchanges also occurred around the topic of work, such as when Jay finished a task and gave a thumbs up sign to Rich, who also worked in fiber optics. Rich responded with, "Are you done with that already? Not bad!" and gave him a high-five gesture. Finally, there were many informal conversations about nonwork activities, such as when a co-worker was overheard asking Larry in the lunch room about the weekend visit from his grandmother. The exchange between the two employees continued back and forth for several minutes, consisting of questions from the co-worker, and short answers and gestures from Larry.

The positive-negative dimension also included neutral exchanges, for example, when Karen was given some finished products to take to a neighboring work section. She was seen to hand the products to a co-worker who in return said, "Thank you." Karen returned to the enclave area looking very pleased with herself, in spite of the neutrality and simplicity of the exchange. It is interesting that even neutral exchanges can be perceived positively by the supported employees, perhaps indicating a sense of "belonging" to the workplace, as well as self-satisfaction.

There were few negative interactions reported in the data, and none was observed. What examples that did occur were mainly hearsay, such as the oft-repeated story that when the supported employees first arrived at NEC America, Inc., some temporary workers made fun of them. The co-workers were always quick to point out that these were not "real" NEC America, Inc. employees, but temporaries, and that they were no longer with NEC America, Inc. Once again this is evidence of their "ownership" of the enclave: the "jokers" were outsiders and the supported employees were NEC America, Inc. employees. This story was repeated so often as to take on the qualities of a "legend" about the

enclave. Legends such as this appear to set norms or standards of behavior for employees. Clearly, making fun of the supported employees violated these standards.

Other stories related by co-workers also concerned the early days of the enclave. One person reported that some workers who had initially teased supported employees were now friends with them and often ate lunch with them. But another worker reported:

> I've seen people in the cafeteria where Larry or Jay would sit down by them and you can tell they're really uncomfortable and then they'll get up and move right away. And they (Jay and Larry) sense that...I don't know, they get a real strange look on their faces like they did something wrong that they don't understand.

This report is interesting because it indicates that acceptance of the supported employees is not universal throughout the plant. It also demonstrates, however, the sensitivity of some co-workers to the feelings of the supported employees and their understanding of the dynamics of social interactions between these employees and co-workers.

An exchange that could at best be described as a "nonexchange" rather than a negative one also was observed in the cafeteria and recorded in field notes:

> Larry was sitting with two nondisabled co-workers, Jane and Mary. Karen had finished her lunch and approached the table. She stood behind Mary, not saying anything. She stood wringing her hands, her head was bowed, and she was smiling. A young guy came up to Jane and Mary and showed them some photographs. Karen was heard to say, "Baby?" Jane looked at the pictures and handed each one to Mary, ignoring both Larry and Karen. When they finished with the pictures they placed them on the table as they continued to talk to the young man. Larry moved in his seat to get a glimpse of the top photograph. Karen moved away. The bell announcing the end of lunch rang and the two women got up from the table and moved toward the manufacturing area, still talking to the young man. Larry followed at a distance.

The two supported employees, while a part of this scene, were not participants in it, and it was difficult to interpret from their facial expressions or behavior how they perceived it. Interactions such as this might have several meanings: 1) the supported employees do not fit into

the more personal and meaningful exchanges between co-workers, or 2) the supported employees blend into the worksite and are no longer the center of everyone's attention. There could also be other ways of framing this interaction as we come to understand the complexities of this worksite. The disparity in these interpretations underscores the importance of striving to understand the typical patterns of communication and relationships of any worksite.

Spontaneous-Ritualistic. Most of above examples of interactions were also spontaneous exchanges. Interactions such as the friendly greetings, however, might be characterized as ritualistic since they occurred repeatedly between the same two individuals and take on a shared meaning between them. Ritualistic interactions can be very positive, and probably have to evolve over some period of time or some number of shared exchanges. For example, the series of interactions mentioned at the beginning of this report between Stewart and the co-worker had a repetitive character before they became ritualistic. The interaction between these two individuals did not change very much in behavioral terms, yet it became invested with shared meaning as they choreographed their nonverbal greeting for regular use.

An exchange that appeared to serve a similar function was observed occurring between Jay and Rich. Rich's fiber optics work area was on a different schedule than the enclave's. At the sound of a bell they went on break or to lunch while the supported employees continued working. On several occasions as Rich was leaving his area, Jay yelled and pointed to Rich's work table until he returned and shut the light off. Jay continued gesturing until Rich would pull down a glass plate over his work table, smiling and saying, "Is that ok now?" as if the exchange were a continuing joke between the two of them.

These interactions are interesting because they provide a sense of shared experience and comradery, but they are not dependent on a high level of communication skills. They seem to provide the participating co-worker with a context for communicating with the supported employee and perhaps a sample of behavior against which to measure other knowledge about the worker with the disability. In the example with Stewart, his behavior did not require modification; the co-worker changed his interpretation of it, and it apparently gave them both a sense of satisfaction. This simple interaction takes on greater importance when one realizes that a support agency staff person could easily have intervened to change the path that Stewart took to his work station to prevent him from "bothering" his fellow co-workers. The second example demonstrates how easily such simple routines can change in specific details while retaining the overall continuity of ritual exchange. Rituals can emerge only when opportunity for repetition is available.

This would seem to require that supported employees work in close proximity to workers without disabilities.

Verbal-NonVerbal. While many reported and observed interactions contained a verbal component, many others included a nonverbal component. For the supported employees with few verbal skills, these nonspeaking exchanges were especially important because they provided an opportunity to establish a sense of rapport with their co-workers and a sense of belonging to the culture of the workplace. The salutation example given above represents this type of exchange. In other cases, the interactions were a verbal/nonverbal mix, where one person spoke and the other did not. The following observation from the field notes illustrates such an interaction between two employees, one of whom uses only a few words. This interaction demonstrated a shared concern common to the culture of any workplace:

> Shortly after 11:00 Rich walked over to Jay, pointed to his wrist and said, "Time?" Jay held out his wrist to show Rich his watch. "Pretty soon, lunch," replied Rich. "Hungry?" he asked of Jay. Jay shook his head yes. Rich replied, "Yeah, me too," patting his stomach. "My stomach's growling."

When supported employees possess few verbal skills, the potential for isolation within the workplace and the restriction of their communication to their support agency staff usually increase. In the very beginning days of the enclave at NEC America, Inc., the support agency employee, Wendy, taught a few communication signs to co-workers each morning for use with the supported employees. A few co-workers were seen punctuating some of their conversations with signs, and several reported a great interest in sign language. For the most part, however, people were using common gestures to communicate. The supervisor of the area that included the enclave reported that people were interacting more with the supported employees. "Even though some of them don't have many words, people are learning how to get around that," he said. As one of the co-workers stated, "They're nice people. I mean, the only problem is, you can't understand 'em."

Many of the co-workers reported that interactions with the supported employees were initiated by those employees, especially in the early days of the enclave. Several co-workers reported that they first became friendly with supported employees when the latter just "started hanging out with us" or injecting themselves into conversations between co-workers. Even individuals without verbal skills managed to make their presence felt. When the co-workers talked about the supported employees, they most often mentioned Larry, Jay, Karen, and Theresa,

the latter being the only one with good speaking skills. The other three were often mentioned as being "outgoing" and having "good personalities." These supported employees supplemented the use of individual words with eye contact, smiles, pats on the back, and waves to interact with co-workers. However, the supported employees with more limited verbal skills, and who seemed to lack even these communicative gestures, were the most isolated, rarely being mentioned in the interviews with co-workers. The interactions of these employees were observed to be restricted, for the most part, to their support staff.

Hierarchical-Egalitarian. This dimension describes interactions characterized by a status of equality or inequality between the two parties interacting. The dimension corresponds to the attitudinal category of perceiving the supported employees as either clients or co-workers. At the hierarchal end, for example, co-workers interacted with supported employees as if the former were children, students who had to learn to be workers, or clients who were not as legitimate as "real" workers. For example, one supported employee, the co-workers reported, played the role of "class clown." In their words, "he's such a ham. He loves to make us laugh and we always are laughing at him." He not only was a class clown, but also had child-like characteristics:

> He has trouble with his speech, but he understands everything you talk about and it's tough sometimes to have you forget that...You'll be talking, and, well, joke about something he just did, and he understands everything you're saying. You have to watch yourself.

Supported employees also have to be protected by co-workers, sometimes even from themselves, such as when one co-worker reported that he didn't walk by the enclave area anymore because several supported workers would wave and call out to him. He did not want them to be distracted by him and get into trouble with their support staff. It is interesting that although such behavior would not be atypical in that worksite unless carried to the extreme, the supported employees appeared to be viewed as students answerable to their teacher-staff.

On the other end of the dimension are interactions in which supported employees and co-workers shared the commonality of working together. The interactions observed seemed to fit the typical pattern of interactions within the component preparation area. The boredom of doing repetitive work, for example, was shared by making "small talk," even though the "talk" consisted more of giggles than talk. Jay, one of the supported employees, was observed making funny faces and gestures to Rich in the adjacent fiber optic area. They both appeared bored while working on their individual jobs. A short time later, Rich

provided comic relief to Jay and other workers in the enclave area while he tried to change a light bulb in the work light over his table. He was obviously enjoying this break in the routine as he made exaggerated and exasperated movements to change the bulb.

Belonging to any group means sharing "inside" jokes, sometimes at the expense of someone else. Jay and Harry, a co-worker who worked in the same area as the supported employees, were observed making funny faces and gestures to each other behind the back of Sara, another co-worker in the enclave area. By the look on her face, she was aware of their somewhat adolescent behavior. She chose to ignore it, however, occasionally smiling, first at Harry, then Jay. In this exchange, Jay participated as an equal; in fact, it was the use of sign language that probably facilitated the exchange. All of these exchanges demonstrate the extent to which social interactions occur simultaneously with work, and are completely acceptable, even desirable, behavior.

Co-Worker Perspectives on Support Staff

The co-workers and management personnel at NEC America, Inc. held the support agency staff in high regard. Adjectives used to describe them were "approachable," as in "you can always go to Wendy with any questions; she's very approachable." The staff was also described as "very good at their jobs." That the enclave was considered a success by everyone involved was attributed in large part to the support agency.

The support agency staff was also regarded as having special expertise in the areas of job identification, placement, training, and knowledge. One management person had very little confidence in his own ability when it came to addressing the special needs of the supported employee: "We wouldn't have known what to do, or we'd have come up with exactly the wrong thing." In regard to the support agency identifying the supported employees and making placement decisions, one co-worker said, "I wouldn't know what to interview for or how to do it properly." These comments were made shortly after the start of the enclave. Co-workers of the supported employees reported that the support agency staff "took care of the supported employees," and had a "special approach" for motivating them. Other comments focused on the support staff's special knowledge, as in "Wendy knows, she's around it all day, she knows what goes on," and "she told me how to act around them—just treat them like anybody else." The special expertise of the support staff was well demonstrated in the example given previously concerning a training program for one of the supported employees.

Perhaps as a result of this perspective of the support agency as "expert," the enclave appeared to exist almost as a separate entity within the component preparation area. There appeared, in fact, to be two

divisions within this department, the enclave of supported employees and the nondisabled employees, although both groups did the work required within component prep. The coordinator of the area, Rick, was observed giving assignments to, consulting with, and supervising the nondisabled co-workers. Wendy fulfilled this role with the supported employees, in addition to training them. She also supervised several helpers, assisted NEC America, Inc. employees who had been trained to do training, and provided one-to-one support for those supported employees who did not work independently. Undoubtedly there was coordination between Rick and Wendy, but the division of labor remained. The separateness of the enclave was also observed in the lunchroom. Most of the enclave members, with the exception of Jay, Larry, and sometimes Karen, appeared to sit only with their support staff in the cafeteria for lunch. It is especially noteworthy that the supported workers who were nonspeaking but extremely interactive were the ones seen eating with nondisabled, noncomponent preparation workers.

Discussion

This description of perspectives on relationships contributes to an understanding of the complexity of social integration in supported employment. Even a limited amount of data yielded rich and "thick" descriptions of the culture of one particular worksite. This analysis focused on attitudes expressed by co-workers toward supported employees, interactions reported and observed between the two groups, and the attitudes expressed by co-workers about the support agency staff.

The co-workers expressed a variety of attitudes toward their fellow employees with disabilities. These attitudes ranged from acceptance as equal co-workers to the perception of them as client or student workers. They also voiced typical societal stereotypes of the supported employees as objects of charity or as mindless, repetitive robot workers. Underlying the breadth of these attitudes were strong expressions of pride at being involved in a successful, innovative endeavor. Clearly there are complexities and nuances to these relationships that we have barely begun to grasp. That the stereotypical attitudes persisted a year after the arrival of the enclave is a particularly interesting point and one deserving further attention. It should not come as a surprise, however, that co-workers bring to their job attitudes that result from their own interactions with people with mental retardation, or the lack of such interactions. Several co-workers, for example, reported knowing neighbors or having family members with mental retardation. An equally significant number, however, reported not having had any direct knowledge of people with mental retardation.

The interactions reported in this study are noteworthy for several reasons. First, they appeared remarkably routine, if not superficial, falling well within the range of observed interactions among nondisabled workers at this plant. Second, interactions were reported and observed with the one supported employee possessing fluent verbal skills, as well as with several with limited or no verbal abilities. Nonspeaking methods of communication, including hand and facial gestures and nonspeaking routines, gave workers such as Karen, Jay, and Larry opportunities to form friendships not dependent on their verbal ability. A key factor appeared to be their willingness to initiate interactions, especially in the early days of the enclave. This persistence is consistent with recent research addressing the perspectives of people with and without disabilities toward their friendships with each other (Lutfiyya, 1990).

The typology of interactions presented here is useful because it draws our attention not only to direct verbal interactions but also to the existence and importance of nonspeaking, nontypical interactions. The spontaneous-ritualistic category, for example, highlights small behaviors that are so embedded in the context of the larger workplace as to be easily overlooked. Ritualistic behaviors are especially interesting for their potential for expanding the interactions available to nonspeaking supported employees. There could also a negative side, in that they potentially become too routine and limited. Application of both the typologies of attitudes and interactions to additional sites of supported employment will expand and enrich our understanding of these components of relationships.

The attitudes expressed by co-workers toward the support agency staff provide support for recent discussions aimed at rethinking the role of the support staff or job coach (Hagner, 1989; Nisbet & Hagner, 1987; Mank, Oorthuys, Rhodes, Sandow, & Weyer, in press; Rhodes, Sandow, Mank, Buckley, & Albin, in press). While support staff members were all held in uniformly high esteem, there appeared to be a natural tendency to place them in the expert role. In spite of expressed attitudes that the supported employees "belonged" at NEC America, Inc., the support staff was perceived as possessing the expert knowledge and therefore authority or legitimate ownership of the supported employees. Having given the support staff this authority, it appears that co-workers observe and interpret the relationship between staff and supported employees following the human service model of professional-client. They then use this model as a framework for interpreting their own relationship with the supported employees. This attitude toward support staff, coupled with the enclave model itself, created an island of supported employees and their staff within the component preparation area. While these supported employees were not as segregated as sheltered employees, the opportunities for the occurrence of natural supports and relationships

seem diminished, especially for the supported employees with the most limited communication skills. This is evidenced by the fact that one year after the establishment of the enclave, dispersal of the supported employees had not yet occurred, despite the assumption by most of the co-workers that this was a natural progression.

Implications for Future Research

The areas or questions we are addressing in continued research efforts at NEC America, Inc. and other sites are:

1. *The changing nature of social integration over time.* Given that co-workers transfer within plants or leave for employment elsewhere and that new co-workers arrive, do existing relationships remain stable over time? Do relationships evolve to after-work or weekend activities? Does the role of co-workers change over time? Does the role of the support agency change?
2. *The impact of the enclave model on social integration.* Are relationships qualitatively different in other supported employment models? We have an excellent opportunity to observe the changes that occur at NEC America, Inc. as the supported employees are dispersed throughout the plant, as well as to observe a site where co-worker support was arranged at the onset in the absence of a support agency.
3. *The issue of "orientation" for the co-workers.* This study has too little data to advocate either a formal orientation or an informal, "just do it" process. One note on orientation, however, is curious: management personnel reported that no formal orientation occurred when the enclave was introduced to the worksite; co-workers reported, that, yes, indeed, they received such an orientation. Perhaps co-workers will perceive an orientation whether or not it is "formal." They will certainly form opinions and attitudes about both the process and the workers based on their individual experiences and perspectives, on their observations of the introduction of the enclave, and on their perception of the relationship between support staff and supported employees.
4. *Communication skills.* The challenge for support agency staff and/or supervisors is to find ways to encourage the interactions between co-workers and supported employees whose personalities are not as outgoing or whose repertoire of social behaviors has been limited to passive interactions.

We present this research recognizing the limitations of our understanding of relationships that occur in supported-employment sites. The data collected at this one site demonstrate the complexity of the questions and the need for answers that are useful to both support staff and co-workers. This study also demonstrates the appropriateness of qualitative research methods to contribute to this understanding. The nature of a worksite is such that relationships are multifaceted, subjective, and complex, but there are also parameters and standards of appropriateness. The addition of employees with serious support needs contributes an additional layer of complexity, one we can begin to discern by describing and understanding the perspectives of the people who inhabit that worksite.

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Conclusion: A Future Research Agenda

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The research articles presented in this monograph do not claim to have found the key to understanding social integration in integrated worksites; however, each provides a small piece of a much larger picture, and, in doing so, brings that picture into better focus. A brief review of the major points of each article is in order.

Storey and his colleagues found that the social contacts of workers with and without disabilities at NEC America, Inc. differed in size, level of engagement, and composition. They nonetheless show remarkably similar patterns. It was also extremely interesting to note the variation that existed among workers. Clearly the employees without disabilities engaged in more work and personal conversations and did so more often than the workers with disabilities. Individual variations did exist, however, since a few of the workers with disabilities had more social interactions than did several workers without disabilities. It was also noted that the supported employees interacted more with their support person, or job coach, than with any other person, but it was also clear that workers without disabilities included the supported employees in their conversations.

The research by Storey et al. used direct structured observations as the data collection method. Yan and his colleagues used the same data set for detecting patterns of interaction groups among the workers. It follows, then, that the interaction categories of personal conversations, greetings, work conversation, and social amenities were identical. This research, however, used the data to formulate a picture of groups around these various interactions. This picture presented a more in-depth look at the social integration occurring at NEC America, Inc. The clique analysis of social amenities, which included greetings, indicated the greatest degree of integration of enclave workers and workers without disabilities. Concerning training and instruction topics, however, the enclave workers and their support person formed a segregated unit. This was not particularly surprising, given the nature of a job coach's responsibilities for training and support.

Interactions involving training and receiving compliments occurred at relatively low frequency levels at the worksite. However social amenities, work conversations, and personal conversations occurred much more frequently. The description of the work conversation clique confirmed Storey et al.'s finding that workers without disabilities engaged in more work conversations and did so more frequently than did the supported workers. The latter engaged in work conversations

predominantly with their support person. At lower intensity, or frequency levels, however, the supported employees joined the clique with the workers without disabilities.

Examining the cliques around personal conversations, the researchers found that at high frequency levels the workers were segregated into those with and those without disabilities. As the frequency level decreased, however, the workers with disabilities gradually joined the others.

An interesting feature in all of these conversational maps was the dominance of the support person, Wendy. Most often she and several supported employees formed cliques separate from the workers without disabilities. Another important feature of the maps is the indication that individuals were socially isolated, not joining in cliques or found in extremely low-frequency cliques. Whether these individuals are workers with disabilities or without, they would seem to be a concern to NEC's supervisors.

The Olson and Ferguson research article approached the issue of social integration from a different perspective and attempted to understand the social construction of the relationships between the workers with and without disabilities. They devised a typology of co-worker attitudes that emerged from the transcribed interviews and observational field notes. This typology included a wide range of attitudes and perceptions expressed about the supported employees, from regarding them as co-workers to stereotypical attitudes of treating them as objects of pity and charity.

The interactions observed between the two groups of workers contributed to the development of a conceptual scheme based on a continuum typology. This typology provided a framework for understanding the complexities involved in interactions. Ritualistic interactions, for example, may be superficial connections between workers, but they also serve a purpose of providing the workers with a recognition of shared experiences and comradery. The descriptions of the relationships between supported employees and their co-workers demonstrated that both groups will construct meanings to interactions and that some of the supported employees can blend into the culture of the workplace.

On a final note, the Olson and Ferguson study complemented the two previous studies' findings concerning the position of the support staff or job coach. The co-workers perceived the support staff as extremely important to the success of the enclave project and regarded them as the disability experts on site, deferring to them a great many decisions.

In the introduction to this monograph, we posited three observations about the state of research in supported employment:

1) Research in this area has barely scratched the surface of understanding the complexities of integrated worksites.
2) Research to date has largely been confined to a narrow research paradigm, that of positivism, or quantitative research.
3) Existing research has not looked to other fields for useful insight into integration.

Addressing the first two observations, these three studies individually add to our knowledge base concerning social integration issues, as indicated by the previous summaries. However, when considered as a whole, the studies not only add their individual findings to the knowledge base, but also take on a cumulative strength by juxtaposing quantitative and qualitative perspectives at one particular worksite. The research portrays NEC's first year of adjustment to the placement of an enclave of eight workers with significant disabilities. We see that the co-workers appeared to accept the enclave at the worksite, that Wendy was highly regarded, and that some of the supported employees were very well liked and participated in some routine interactions. The ability of the supported workers to perform complex tasks and achieve a degree of productivity did not seem to be an issue in the interviews and observations. The workers with and without disabilities achieved a degree of integration that included social interactions and work discussions and, for some, mingling together during lunch and breaks. That this included some of the supported employees with little or no verbal skills, e.g., Karen, Jay, and Larry, is quite remarkable. The clique analysis portrayed these three employees along with Theresa, a supported employee with very good verbal skills, as embedded in the interactions involving work and personal conversations, although at lower frequency levels than in the cliques involving the workers without disabilities. These four supported employees were most often mentioned in the interviews with co-workers, as well as being observed engaging in casual conversations with co-workers.

Less surprising is the fact that several of the supported employees, those with the most severe disabilities in respect to communication, for example, Stewart and Julia, were very isolated within the job site and interacted largely with Wendy.

The use of these multiple methodologies in understanding social integration has several advantages. First, there is a degree of validation of individual findings. The picture of social integration portrayed by the structured observation and clique analysis as essentially two groups working side by side, with a degree of interaction according to topics and individuals, is essentially similar to the description portrayed by the ethnographic study. All three studies also confirm the growing concern in the literature that the job coach or support staff provides an unintended barrier between workers with and without disabilities.

Second, the three studies taken together add more depth to our understanding of the complexity of social integration than any one study alone. The direct, structured observation provided data on the numbers of interactions among workers. It illustrated which workers interacted most frequently and which types of interaction topics, among those selected by the researchers, dominated conversation points. The clique analysis of social networks used this same data set to identify the various groupings of workers and demonstrated where the supported workers and Wendy were located in these groups. The social maps are particularly graphic illustrations of the placement of individual workers in respect to the intensity and frequency of these social groupings in the worksite. The ethnographic study provided a more in-depth, richer description of the site, relationships among workers, and the perspectives of the co-workers toward the enclave endeavor. Taken together, the studies give us a better sense of the enclave's first year at NEC America, Inc. and a better, although not yet a thorough, understanding of the culture of this particular worksite.

A third advantage of the multiple methods, however, is not the result of their complementary findings but of their different theoretical perspectives. The structured observation study and the clique analysis reflect the positivist paradigm of research. This paradigm, which dominates disability studies, results in a research design that deductively attempts to explain, predict, and ultimately control, or shape, behavior. Based on a belief in a single, tangible reality that can be identified and measured, the strength of this perspective is that it aggregates large data sets, reduces its findings to generalizable theories, and provides descriptions and explanations of relationships that exist within its view of reality.

In contrast, the ethnographic study reflects an interpretivist or qualitative perspective based on an understanding of the social construction of reality. Given this view, research is designed to describe and understand individual realities and the social context in which they exist. The strength of this research is in the depth of understanding it provides of complex relationships.

Logically, research from each of these perspectives asks different research questions and proceeds along separate paths, using different designs and methodologies to reach their respective ends. Each has its own strengths and weaknesses, integrity, and logic. To merge these perspectives into one study defies logic and, to some, results in questionable research designs, although the matter is a topic a debate in many disciplines (Miles & Huberman, 1984; Hatch, 1985; Smith, 1986). However, designing research to take advantage of each strength would seem to provide an ideal research environment, the proverbial best of both worlds. The challenge is to design *parallel* research strands to ensure the integrity of each methodological perspective.

Having discussed these three studies in respect to the concerns for additional research and the need for multiparadigmatic research strategies, we now turn to our third concern, the need to look to other fields to avoid "re-inventing the wheel" with many issues in supported employment. Issues arose in all three studies in this monograph that have been addressed by research in other disciplines. In the Storey et al. article it was clear that employees with and without disabilities had significantly different social interaction rates. For example, an average of 3.5% of the conversations of the supported employees were work-related, while the conversations of their co-workers without disabilities averaged 21.28% around work topics. Psychologists who study social interactions regard work conversations as important to a new employee's growth at work. Reichers (1987), for example, reported that increasing the interaction rates of new employees through training or orientation should facilitate their inclusion as productive members of an organization. Considering the Storey et al. findings, this suggestion might prove useful to supported employment practitioners as they attempt to reduce the unintended barriers to socialization that result from the support they provided to workers with disabilities.

Yan et al.'s finding of social isolation experienced by some supported workers, e.g., Stewart, due to communicative limitations can be complemented by communicative research focusing on the development of language in the natural environment (Halle, 1987). Efforts to increase the use of communication by employees who are socially isolated should result in an increase in the frequency of interactions among workers. The finding of social isolation, or segregation, found in both the Storey et al. and Yan et al. articles should lead one to Wolfe's (1970) work on social network participation. Wolfe suggested that all forms of relationships be regarded as networks. Following Wolfe, Yan's social maps of cliques might provide a way in which social integration can be viewed.

Social identity theory (Ashworth & Mael, 1989), a strand of sociology, could have been used to predict that the job coach model common to supported employment would result in employees with disabilities becoming socially isolated from co-workers without disabilities. The tendency of employees to classify themselves according to shared attributes (gender, age, experience, etc.) in order to identify themselves within membership groups at work would suggest that the presence of a job coach would be regarded as intrusive and set the worker with a disability apart from co-workers.

Not only do other disciplines have potential for expanding the substantive nature of research in supported employment, but they may also provide new research techniques and procedures. The use of sociometric techniques more commonly found in sociology (Knoke & Kuklinski, 1982) and further developed by Yan (1988a; 1988b) allowed the examination of the location of the supported workers with respect to

co-workers in the various interaction groups. This shifted the focus of research from individual behavioral characteristics to the dynamic interplay between workers. This offers a functional view of social "competence," interpreting clique participation as the outcome of socially competent behavior. In disability studies, social competence has most often been regarded as something inherent in the individual (e.g., Calkins & Walker, 1990; Meyer, McQuarter, & Reichle, 1990; Salzberg, Likins, McConaughy, & Lignugaris/Kraft, 1986). Other disciplines, however, perceive social competence as more specific to the contextual situation (e.g., Reichers, 1987; Wolfe, 1970). Yan et al.'s work brings the research from these disciplines into the discourse in disability studies and then expands it by focusing on the culture and constituency of the worksite. The next step is to shift the focus again, from structured observations of interactions to the co-workers' perceptions of interactions as a measure of social competence (Yan, Mank, Sandow, Olson, & Rhodes, 1991).

As was discussed in the body of Olson and Ferguson's study, the ethnographic study reflects a long tradition of qualitative research found in sociology and anthropology, one that is still emerging in disability studies. The paradigm shift is occurring, however, in a field that should be very relevant to supported employment—that of human resource management (Marsick, 1990). The focus in this study on the culture of the workplace has parallels in business management studies (Allcorn, 1989; Kilmann, 1990). The use of a typology of interactions, particularly the category of hierarchal-egalitarian interactions, could be further explored from the perspectives of the trend in business to promote "team building" as a means of quality improvement and the focus in management theory on the change from "tall" management hierarchies to "flat" organization structures (Deming, 1986; Juran, 1988; Tomasek, 1990).

In summary, we have argued that more in-depth research using multiple paradigms and looking to other disciplines is required to better understand social integration and supported employment. The process of participating in the research studies presented in this monograph has greatly informed our own research agenda. There are three major areas that seem to be prime targets for expanded research: workplace culture, diversity of the workforce issues, and the nature of support.

Workplace Culture

Although each of us participates in a workplace culture, it is an area to which we have given little serious consideration until recently. The three studies in this monograph helped us to learn about the culture of NEC America, Inc., but it's only a beginning. The cultures of workplaces as diverse as fast food restaurants, electronic manufacturing firms, and

greenhouses remain a mystery to us. Research in other fields has investigated workplace cultures, and we need to apply their knowledge and add to it our own knowledge of people with disabilities. We need to understand issues of capacity, perspectives of workers from different economic classes and education, and the process of assimilating new employees into the culture. Lastly, we need to understand the impact workers with severe disabilities have on diverse workplace cultures.

Diversity of the Workforce

People in business understand a fact that is relatively new to us: the nature of the workforce is changing to one with greater diversity along racial, ethnic, age, and experiential lines. At the same time, there is a workforce shortage predicted for the year 2000 (Johnston & Packer, 1987; Committee on Labor and Human Resources, 1990). Researchers and practitioners across many fields, including special education and rehabilitation, share common concerns of understanding diversity, the place of workers with disabilities within diverse workforces, and the impact of a diverse workforce on human resources, social service systems, and social policy.

The Nature of Support

Closely connected to the issue of a diverse workforce is the changing nature of support provided to all employees, including those with disabilities. We learned from the co-workers at NEC America, Inc. that the model of an enclave and the traditional role of a job coach limited opportunities for the employees with disabilities who need support to receive this support from co-workers. We were surprised that co-workers were so interested in the supported employees and actually wanted to help them succeed as NEC America Inc. employees. As providers and researchers, we need to explore in greater depth various models of support already available within the workforce and understand how and why some businesses may be willing to provide additional support to employees with severe disabilities. We also need greater understanding of the communication needs of individuals with disabilities, how these needs might be met, and the impact this will have on the workplace. Lastly, social behavior and social competence are areas of common interest across disciplines. They require indepth collaboration and the utilization of a variety of research paradigms to better understand the complexities of support and workers with severe disabilities.

These research areas are not meant to be inclusive of all research involving supported employment; they are limited to the intersection of social integration issues and employment for people with severe disabilities. All of these issues would be greatly enhanced by applying both quantitative and interpretivist research perspectives, and all have parallel research points in business management, human resource development, sociology, psychology, and communications research. It is time to explore not only the community and neighborhood in which people with disabilities live and work, but also the larger academic community in which we as researchers and providers reside.

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