

## **An Investigation of the Effectiveness of the Sound Response Program**

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## **The Effectiveness of the Sound Response Program**

This is the initial report regarding research conducted by research team, PI David Rosenthal, Assistant Professor of Rehabilitation Psychology, UW-Madison, Co-PI Fong Chan, Professor of Rehabilitation Psychology, UW-Madison, and a 1/3 time PA (12 mo), Jacob Chan, Master's student in Rehabilitation Psychology. This investigation was conducted with guidance provided by the Sound Response team. The Effectiveness of the Sound Response Program was measured by an evaluation of participant gains in self-direction, quality of life, and independent Living, an evaluation of participant satisfaction with the program, an assessment of stakeholder perceptions regarding the Sound Response Program, and an assessment of the fiscal impact of the program on the county (Dane) and Agencies.

### **Process**

There has been a long-standing, positive, collaborative relationship between the Waisman Center and the UW-Madison Department of Rehabilitation Psychology and Special Education. Due to this positive relationship, many students in the Rehabilitation Psychology area have been employed as Project Assistants for various studies and programs at the Waisman Center. Furthering this positive relationship, faculty was contacted by Sound Response administration to discuss the possibility of faculty from the Department of Rehabilitation Psychology and Special Education conducting this investigation. The investigation was intended to support administrative staff in designing comprehensive evaluations of program goals and services, ascertaining strengths and weaknesses of the program, evaluating the effects of program participation, and future strategic planning and program improvement efforts.

The report was funded by a grant from the Federal Administration on Developmental Disabilities to the Waisman Center, University Center of Excellence on Developmental Disabilities, University of Wisconsin Madison.

The measures for the statistical evaluation were identified from the literature by the PI and Co-PI. The plan was to interview as many of the 138 program participants as possible to ascertain if they demonstrated gains on the criterion variables. Under the guidance of the PI and the Co-PI, a team of five Master's degree, also from the Rehabilitation Psychology area, was formed to assist with the data collection process. The team met weekly to discuss problems associated with the protocols, problems associated with the reliability of responses (particularly with participants that had greater cognitive and communication limitations), and problems with the

actual administration of the protocols (e.g., acquiescent response sets). The team of Master's degree rehabilitation psychology students received credit for their research requirement in the Rehabilitation Psychology program. This has been found to be a very effective method to conduct research using a team approach and provide students with hands-on experience.

## **Overview of the Sound Response Program for People with Developmental Disabilities in Dane County**

The Sound Response program (Website: [www.waisman.wisc.edu/soundresponse/](http://www.waisman.wisc.edu/soundresponse/)) began supporting three homes in July, 2002. The University of Wisconsin-Waisman Center-Community TIES program partnered with Dane County in initiating and maintaining the Sound Response Program.

Services for individuals with Developmental Disabilities in Dane County often consist of, county funded, ongoing overnight staffing for individuals who may need occasional overnight support. This support model assures safety but is typically staff intensive, costly, and somewhat intrusive (individuals are required to share their homes with live-in staff who frequently change). An alternative approach when nighttime intervention is warranted, but rarely needed, is to offer a combination of off-site monitoring with response by professional staff, as a support model.

Sound Response supplements direct staff support through the use of technical/mechanical supports. These technical/mechanical supports are in the form of a variety of monitoring devices, which already are being utilized in private homes and security systems. These include speaker phones, pagers, motion detectors, smoke detectors, various burglar alarm systems, sound detectors, floor pressure pads, personal assistance systems, and door and window sensors.

This program does not provide services for individuals who are medically or behaviorally at risk, but serves individuals who typically sleep through the night and have paid overnight staff "just in case" there are problems during the night. It does not affect the support participating individuals currently receive during awake hours.

Potential participants are identified by the Department of Human Services with input from developmental disability residential agency providers. The participant and guardian are involved with the evaluation, environmental assessment and the development of the protocol that is used to support the participant during Sound Response activities.

Sound Response provides services from one monitoring site (in Madison), and three strategically located responding sites in Madison, Stoughton and Mt. Horeb, WI. Sites are staffed from 9:00pm to 7:00am.

Obtaining Sound Response support is facilitated through a referral process. Once a referral is received and the respective person's team feels the referral is appropriate, Sound Response staff meet with the person and their team to assess the supports necessary. The system combines a number of devices (based on the individual's needs and wishes), to alert off-site response staff to provide support and intervention when necessary. Participating individuals are trained on how to activate each device if they need assistance. Every participating residence has at least one monitoring device placed in their household.

Residential support staff activate the system at the end of their shift, which notifies the off site monitoring staff- via a LED light or an alert system. Residential staff are required to call before leaving individuals homes. They report illnesses, behavioral concerns, unusual events, or if a consumer is going to be arriving home at a later time. Sound Response staff change individual protocols on a nightly basis if necessary.

Alarms are received by a computer through the phone line, which is monitored by the two Sound Response staff at the monitoring site. The computer displays the sensor activated, client notes, protocols, medications, contact numbers, and other necessary information. Depending on the type of the unexpected activity (this could include sounds, activity, smoke, or commotion), the Sound Response staff establish two-way contact with the person over the phone (or speaker phone) to ascertain immediacy of need; drives to the residence to provide necessary support; contact the current crisis support team; involves the necessary authorities (Fire, Police, EMS); or uses any combination of these responses. Responder locations are situated so all households can be reached within 5 minutes. Sound Response staff report that, when interventions are necessary, the average amount of time for staff to reach a household is 3-5 minutes.

Sound Response offers short-term interventions (usually 30 minutes or less) when staff intervention is needed. Participant eligibility criteria states that participants must not have significant behavioral or medical conditions that would require a more staff intensive environment. Participants need to be willful in their efforts, as the system is an elective system.

Sound Response staff are required to make several visits to Sound Response participants homes each month.

Sound Response currently supports 136 people and 83 households in Dane County.

### **The Sound Response Program in the Context of Dane County's Self-Directed Services (SDS) Model**

Beginning in 1996, Dane County, Wisconsin entered into a systems redesign for adults with developmental based on the principals of Self-Determination.

Dane County, situated in south central Wisconsin, has a total population of a little over 425,000 people (2000 census). Of these, about ½ live in the city of Madison, the State Capital and County Seat; another ¼ live in other 9 smaller communities (some adjacent to Madison); and the remaining folks live in rural settings. As of January 1, 2005 roughly 1,100 adults and 800 children with developmental disabilities were accessing services provided through the County system. For 2005, the total budget for children and adults with developmental disabilities is around \$73,000,000. The Dane County Developmental Disability system has developed support models to promote self-determination for individuals with disabilities. Beginning in 1996, Dane County, Wisconsin, entered into a systems redesign for adults with developmental disabilities based upon the principals of Self-Determination. As of January 1, 2005 more than 1,100 adults with developmental disabilities were accessing services provided through that redesigned system.

The intent of individualizing funding and increasing choices is to enable people to obtain the support they need to compose their lives as typical members of our communities.

The process has occurred within a period of diminishing fiscal support for human services by the state of Wisconsin. It requires individuals, agencies and the county to work within and continue to address budgetary constraints. Over time, the county DD services have changed the organizing principal for how money “flows” within the county system to include a process in which each individual has the option of creating a plan to obtain the support they require within an individual budget based upon their needs. This process: establishes an individual rate for each person in need of support; provides each person with the knowledge and support needed to make informed choices; provides an effective system of accountability for paying for support; provides an effective system to help people obtain the outcomes they want in their lives; and maintains an effective county and provider infrastructure.

*Providing information and support to each person: The role of the support broker*

In the current system of *self-directed services (SDS)*, a system of individualized funding, support and services, as individuals enter the adult system, they choose a support broker who is independent of an agency providing direct services. Individuals currently receiving services who wish to utilize their individualized funding to obtain support and services other than through existing county contracts with their service providers would also choose a support broker independent of an agency providing direct services.

Support brokers work with the individual or family to develop a support and services plan; to create a budget within the individual rate set by the county; and offer coordination of support and services. They have particular responsibilities regarding issues of health and safety and actively work to help people obtain support in the manner in which they want their needs to be met, within the limits of the funding available through the individual rate.

Support brokers must have knowledge and experience similar to that of case managers, but understand their role as working for the person receiving support and services, rather than for the county or for a service provider. Support brokers must be approved by the county, and are required to participate in initial and ongoing training.

The required training ensures that support brokers know and understand county and state policies on the use of funding. It provides support brokers opportunities to learn a variety of ways to help people develop individual support plans.

A person may choose a support broker, or if they do not have a preference, is connected to a support brokerage agency. People are free to change support brokers.

### *Developing personal support and services plans*

Within the Individual Rate provided, each individual develops an annual support and services plan, which includes:

- how the person wants to live (where; with what type and amount of support; doing and learning what they choose during the day, evenings, week-ends);
- how support is provided (both paid and unpaid);
- a budget describing what goods, support and services will be purchased;
- the “outcomes” a person expects from people and agencies providing paid support;
- identification of and response to health care needs; and
- identification of existing and potential issues of risk.

The plan is developed with the assistance of a support broker chosen by the person, and with the support and assistance of others who are chosen by the person and their family (if a minor) or guardian (if an adult who has a guardian).

A basic level of support brokerage is provided as a voucher outside of a person's individual budget. This includes the time required of a support broker to get to know the individual, assist the individual in developing a support plan, and provide at least monthly contact with and support to the person. Additional time and expense of a support broker may be purchased within the personal support plan, should the person desire to do so.

It is our opinion that the SDS model used in Dane County, Wisconsin does maximize consumer control of services, and thus, increases collaboration between service providers, consumers of services, and other stakeholders. This enhances communication and trust between service providers and consumers and their families. One of the predominate themes in our qualitative interviews was the importance of "buy-in" and trust in the Sound Response program, staff, and technology systems. Given that the Sound Response program is often initially viewed as resembling "big brother" due to what is perceived as the potential for invasive use of technology, trusting relationships are a critical element of Sound Response success. In the Dane County SDS system, the self-direction, control over services, and choices that consumers, their families, and guardians have as "willful participants," of the Sound Response program create an ideal environment and climate to develop of such a program.

A recent study has supported the effectiveness of the SDS model in enhancing participant quality of life. Miller (2005), reported quality of Life scores for 84 individuals with moderate and mild developmental disabilities (mental retardation) living in Dane County, Wisconsin. In the table below, mean scores for the Dane County sample are contrasted with norms from the Schalock Quality of life Inventory Questionnaire (QOLQ) scores. Importantly, all mean scores in the Dane County sample are higher than the norms of the moderate severity levels presented by Schalock (1996), and for the normed scores for individuals with mild developmental disabilities (mental retardation) and all scores with exception to the Empowerment/independence scale are higher for the Dane County sample. Each subscale has a highest possible score of 30, thus, the highest total score possible is 130. The subscale means listed in the table below indicate a positive quality of life for the participants of the Miller (2005) study. Note: The Schalock scores are separately normed for individuals with mild and moderate developmental disabilities (mental retardation), both are presented in the table below.

Table 1 - Quality of life scores from QOLQ norms compared with Dane County, Wisconsin

	Satisfaction	Competence/ Productivity	Empowerment/ Independence	Community. Integration
Dane County	23.57	23.17	23.02	22.9
Norms – Moderate DD	21.9	21.9	21.0	20.8
Norms – Mild DD	22.7	21.9	24.9	22.5

### **Sound Response Staff**

Staff positions are professional and require a degree in human services and/or significant experience in the field of developmental disabilities. Staff receives standard training (Blood Borne Pathogens, Universal Precautions, First Aid, CPR, Medication Administration, Crisis Response, etc.).

### **Technology**

The technology used by the Sound Response program is provided through work with a local, Madison area vendor who has a contract with Home Technology Systems:

(Website: <http://www.hometechsystems.com/>). Technology includes, but is not limited to speaker phones, pagers, motion detectors, smoke detectors, various burglar alarm systems, sound detectors, floor pressure pads, personal assistance systems, and door and window sensors.

The technology systems used for the Sound Response program can operate on internal re-chargeable batteries in the event of a power failure. This type of remote support is also being used in the field of aging adults and it is anticipated that as technologies continue to develop, the integration of those technologies and supports for people with disabilities will foster new levels of independence. The equipment is portable and can be moved and or modified to accommodate changing levels of support.

Power outages and one computer system crash have been experienced during Sound Response hours of operation, however, due to the system back-ups, no interruptions of Sound Response services have been experienced since the inception of the program in July 2002.

### **Independent Evaluation of Response Data**

An independent, comprehensive review of the SR response data over a two year period revealed no problems with reliability of the technology or glitches in the SR systems. Specifically, the PA hired for purposes of this evaluation, read morning reports from November 7th 2002 through December 3rd 2004. The independent evaluator (PA) found that no major system failures in any responses. Nor were any major system or service breakdowns were noted during this period. The PA's evaluation concluded that SR staff and respondents "attended to all identified problems in a timely manner."

## **Qualitative data – Interviews**

### *Stakeholder perceptions*

There were several themes that surfaced during qualitative interviews with Sound Response stakeholders. Interviews included Dane county administrators, agency administrators, consumers, and parents and guardians of consumers. The following is a synopsis of interviews conducted in May and June of 2005.

### *Program start up*

The Sound Response program was initiated after Dane County social services (particularly the DD system) had experienced two consecutive years of budget cuts. The program was initially started with approximately \$50,000 of County funds. An initial RFP was developed and the Waisman Center was awarded the contract. When Dane County administrators were asked "what was most important or crucial during the conception and initial phases of the program," several interviewees stated that there had to be a creative willingness to "think out of the box" and take some risks to launch such a program.

One of the first themes that surfaced in the interviews was that administrators, parents and stakeholder had negative reactions to Sound Response when it was initially proposed. This initial reaction was reported by all stakeholders that were interviewed. This is primarily due to the use of technology replacing human contact seemed to be less compassionate and person oriented. Many stories and anecdotes revolved around this issue. Most were stories of parents and other stakeholders involved in the program were initially very skeptical about the program and that there was a distinct "learning curve" involved in program acceptance. However, all interviewees also stated that the Sound Response staff was effective at dispelling such negative perceptions of the program. This was usually facilitated by the Sound Response staff presenting at quarterly meetings

supervised by the County, frequently meeting with consumers, parents, guardians and other stakeholders, and demonstrations of the Sound Response technologies and safety features associated with the program. Several parents and agency administrators made positive comments regarding being impressed with the responsiveness of the Sound Response staff to reassure anxious consumers, parents, and guardians about the safety features associated with the program and provide realistic information regarding program specifics.

Another concern expressed by agency administration was the criterion for eligibility for services and acceptance into the program. Sound Response administration states that “the program does not include individuals who are medically or behaviorally at risk,” however, several agency administrators stated that they felt the criteria for was nebulous and they were unsure what the criteria is and how it is applied. Importantly, each of the administrators that mentioned this did say that having uniform and specific criteria may be counter-productive because the needs of each consumer are so unique and necessitate individualized consideration. Several agency administrators mentioned that they perceived inconsistencies in program eligibility determinations across different consumers. Also importantly, when eligibility criteria are questionable, try-out periods are implemented to ascertain program appropriateness.

### *Consumers entering the program*

Several of the individuals interviewed stated that a critical aspect of many of the consumers’ success in starting the Sound Response program is the need for parallel systems to be provided simultaneously. This allows the live-in staff arrangement to continue for the first weeks of Sound Response program participation to ensure a smooth transition of services.

### *Interaction with Agency staffing*

Because Sound Response replaces night sleep in staff with technological assistance, agency administrators were also asked “do you feel that the Sound Response program has displaced any workers in your agency.” Answers to this question were consistent. It was felt that although some agency staff might have been replaced or dismissed from over-night duties, given the need for and shortage of qualified, direct-care staff, no one has been unemployed due to the Sound Response program.

One positive artifact of the Sound Response monitoring that was expressed by agency administrators was that agency staff was held accountable for being at household during check-in times and when needed. Inconsistencies in agency personnel would be found to be away from the house or not on duty as needed.

### *Service Quality*

Overall, agency administrators were very positive about the Sound Response program and services provided to their consumers. Several agency administrators stated that they wished that Sound Response responders were able to spend more time with consumers when they did have to intervene during the evening or at night. However, agency administrators did also state that they understand that Sound Response services are designed to provide short-term interventions (usually 30 minutes or less). The agency administrators seemed to realize that longer intervention times was not possible in many circumstance due to the needs of other consumers and the need for Sound Response staff to cover specific geographic and community areas.

### *Anecdotes regarding consumer gain*

All individuals interviewed had individual testimonials regarding individuals that they knew that had experienced gains in independence by participating in the Sound Response program. Administrators, parents, guardians and other stakeholders reported greater self-determination, self-confidence, and autonomy by participating in the program and being increasingly independent during evening and night time hours.

### *Safety Assurance*

Although Sound Response staff and administration have discussed consideration of all the potential short comings of power outages, tornado drills, and other inclement weather scenarios. Several agency administrators did voice concern regarding how the system would respond to a disaster (e. g., tornado, terror attack) that involved potential crises in many homes. Although protocols have been developed specifying a hierarchy of greatest needs in case of a disaster, concerns were voiced regarding how much Responders could actually do if a disaster was widespread.

### *Future projections*

Several individuals that were well versed in state of the art technologies that can support programs like Sound Response stated that eventually the technology will be provided through cable and not phone lines. This would greatly increase the technological speed and capacity of the program; however, this is not realized at present because cable is not 100% reliable in its present state. Also, the use of Global Positioning Systems (GPS) is another technological advancement that might have utility in comparable programs. GPS systems would have the capacity to allow Sound Response staff to know where an individual is even when not in the home. This would present a secondary safety feature for individuals that may need help if lost in the community (e.g., consumers with Alzheimer's disease or Traumatic Brain Injury). The present technology only allows staff to know what is happening inside a household or if an individual has left a household, and has no technological capacity to provide information regarding activities once some one has left a household.

Lastly, a logical extension of the Sound Response program is to provide comparable, but individually tailored services for aging individuals and individuals with physical disabilities.

### *Fiscal Savings*

Several agency administrators provided specific information regarding how the Sound Response program was providing cost savings. Most agency administrators pointed to the weekend overnight hours that they previously had to pay that were now covered by Sound Response services. One residential agency supervisor specified that when a consumer entered the Sound response program, the residential rates for that consumer were reduced by \$7,800 person. One agency administrator stated that sometimes the fiscal savings make certain living circumstances financially infeasible unless a consumer is provided Sound Response services. In these cases, the agency administrator stated that Sound Response services may not be the safest choice for a given individual, but the best choice given fiscal constraints. This, obviously, necessitates a cautious approach to not allow fiscal savings to influence service criteria and eligibility when consumer safety may be jeopardized.

### *Participant Interviews*

The following are quotes from SR participants. These quotes were obtained through random identification of individuals that participated in the SR evaluation project. The following quotes are taken directly as obtained from SR program

participants. It is realized that participants may be susceptible to acquiescent response sets, creating overly positive responses. However, the quotes were solicited through communication with an independent evaluator.

“Very good, Sound Response is great!” “I’m better off with Sound Response”

“I love Sound Response; they took me to hospital when I was sick that night.”

“I like it, especially when I go to bed”

“The staff are funny, they are very good too.”

“I like they say “good night” to me”

“It helps us a lot. Safety, I feel safer, more free”

“The staff are helpful.”

“When there are problems, they come and help”

“I feel ok with them”

“Chris came over to visit me once in a while, they come and check”

## **Statistical Analysis**

### *Sampling Plans*

All study participants were participants with developmental disabilities from the Sound Response Program, in Dane County, Wisconsin. All participants have developmental disabilities. All of the clients of Sound Response live in their own apartments (either alone or with a roommate) and are supported by residential agencies within the community. They do not live with family members. Importantly, referrals to the Sound Response program can come from any persons on a consumer’s SDS team. Acceptance decisions are made on a case-by-case basis based on participants’ proximity to a response site, seriousness and/or stability of medical condition, and behaviors.

To recruit participants for the study, a letter was sent out all Sound Response participants inviting participation in the study. Researchers interviewed all Sound

Response participants that signed (or had a guardian signed) an informed consent agreement to participate in the study. A second round of follow-up phone calls and letters were sent to program participants that did not respond to the initial recruitment letter. The final sample consisted of 77 study participants, constituting approximately 57% of all Sound Response participants.

The use of this convenience sample threatens the external validity of the study because it may not be representative of all individuals that participate in the Sound Response program. However, given that we were able to interview and analyze data from 77 program participants, constituting approximately 57% of all Sound Response participants, it is felt that there is high probability that the data is a representative sample of the population.

### *Data Collection Procedures*

Data was collected by utilizing both a self-report inventory which was administered in an interview format to the individual and a behavior rating scale completed by a knowledgeable staff member. Self-report inventories were administered by either the investigator or a specially trained master's student in the individual's home. Participants were initially contacted through their case managers/brokers in collaboration with the Sound Response Program and asked to participate in the study. Informed consent was obtained by the individual or their guardian, if applicable, as approximately 50% of the participants had legal guardians. Meeting times were arranged by the project PI, the PA, or the master's student to coincide with a time that a staff member who is knowledgeable about and familiar with the client is scheduled to work in the individual's home. The data from the self-report inventory and the behavior rating scale was administered concurrently so as to not impact client safety and support in any way.

### *Instruments*

The questionnaire to be used in this study consists of two parts. The first part consists of demographic information and all instruments that are self-report in nature (Coping Strategies Inventory, Personal Resources Questionnaire - 85, and Quality of Life Questionnaire). These were administered directly to the individual using an interview format or by proxy when an individual has limited verbal ability.

The second part of the questionnaire consists of the chosen scales of the AAMR - Adaptive Behavior Scale (Socialization, Social Behavior, Disturbing Interpersonal

Behavior, Independent Functioning, Economic Activity, Domestic Activity, and Prevocational / Vocational Activity Scales) and the Anxiety, Depression, and Mood Scale, and was completed by a staff member that is knowledgeable about the individual being rated.

### *Variables*

*Independent variable.* There is one independent variable in this study, the continuous variable, amount of time (in months) that participants have participated in the Sound Response program.

*Dependent variables.* The primary purpose of this study is to investigate the impact of Sound Response program participation on an individual's quality of life, interpersonal skills, coping skills, instrumental skills, social support, psychological health, employment status, leisure activities, and self determination.

- Quality of life was measured by the four scale scores in the Quality of Life Questionnaire (QOLQ): satisfaction, competence/productivity, empowerment/independence, social belonging/community integration, and the total scale score.
- Interpersonal skills were measured by the Socialization, Social Behavior, and Disturbing Interpersonal Behavior scales of the Adapted Behavior Scale.
- Instrumental skills were measured by the Independent Functioning, Economic Activity, Domestic Activity, and Prevocational / Vocational Activity scales of the Adapted Behavior Scale.
- Social support was measured by an instrument derived from the PRQ-85, part 2.
- Self Determination was measured using subscales from the Minnesota Self-Determination Scales and the Exercise of Control Scale (Abery, Elkin, Smith, Springborg, & Stancliffe, 2000)
- Satisfaction with the Sound Response program, services and staff was measured by three questions that were created for this evaluation.

*Demographic information.* Information collected in the demographic information portion of the questionnaire included age, gender, ethnicity, employment status (integrated or not integrated, type of employment, hours per week), and income.

*Quality of life.* Quality of life was measured using Schalock and Keith's (1993) Quality of Life Questionnaire (QOLQ). The QOLQ is the most commonly used tool to measure quality of life in individuals with mental retardation and developmental disabilities. It is a 40-item scale rated on a three-point scale. The instrument is administered in interview format for individuals who have sufficient language skills. If the individual has limited language skills, the instrument is completed by two raters who are familiar with the individual and his or her living environment and activities. The model from which the instrument was developed views quality of life as an individual and subjective occurrence that results from three levels of experience: objective life circumstances and individual characteristics, the values and beliefs of the person, and the beliefs of significant others.

The QOLQ consists of four scales: satisfaction, competence/productivity, empowerment/independence, and social belonging/community integration (Schalock & Keith, 1993). It also provides a total score. The manual of the QOLQ reports satisfactory reliability with interrater coefficients ranging from  $r = .46$  to  $r = .83$ , two-week test-retest coefficients ranging from  $r = .82$  to  $r = .96$ , and alpha coefficients ranging from  $r = .67$  to  $r = .90$ . The manual also provides sufficient validity information. The authors report high face validity due to the fact that items were generated from published sources. Construct validity was demonstrated because QOLQ scores were shown to increase with an individual's level of independence and good objective living conditions. In addition, validity was also supported through a  $r = .57$  correlation with the Lifestyle Satisfaction Scale.

*Interpersonal and instrumental skills.* The American Association on Mental Retardation's (Nihira, Leland, & Lambert, 1993) Adaptive Behavior Scale – Residential and Community (ABS) is an instrument designed to measure the adaptive behaviors of individuals with mental retardation or developmental disabilities. It is a 114-item rating scale and it is to be administered by any person with direct knowledge of the individual being rated or who can obtain that information from a third party. It is scored on 18 domains and 5 factor scores. The domain scores are: independent functioning, physical development, economic activity, language development, numbers and time, domestic activity, prevocational-vocational activity, self-direction, responsibility, socialization, social behavior, conformity, trustworthiness, stereotyped and hyperactive behavior, sexual behavior, self-abusive behavior, social engagement, and disturbing interpersonal behavior. The five factor scores: personal self-sufficiency,

community self-sufficiency, personal-social responsibility, social adjustment, and personal adjustment.

The normative sample consisted of 4103 individuals with developmental disabilities in 43 states (Nihira, Leland, & Lambert, 1993). The manual reports alpha coefficients ranging from  $r = .80$  to  $r = .99$ , two-week test-retest coefficients ranging from  $r = .81$  to  $r = .99$  and interrater agreement coefficients ranging from  $r = .83$  to  $r = .99$ . The authors of the ABS also provide extensive validity evidence in its support. Content validity was demonstrated via careful item selection and extensive item analysis. Criterion-related validity was demonstrated with correlation with the Vineland Adaptive Behavior Scales (VABS) and the Adaptive Behavior Inventory (ABI). In these analyses, correlation coefficients for the part one domains and factors ranged from  $r = .31$  to  $r = .71$ , with nonsignificant correlations being found between the prevocational/vocational activity and self-direction domains and the VABS. These general moderate correlations provide support for the ABS's criterion validity. Construct validity was demonstrated via group differentiation and factor analysis.

*Social support.* Perceived social support was measured using an instrument derived from part two of the Personal Resources Questionnaire – 85 (PRQ-85, Brandt & Weinert, 1981). Part two is a measure of an individual's global level of perceived social support. It consists of 25 statements with which the respondent is asked to agree or disagree (e.g. There is someone I feel close to who makes me feel secure...). Each is scored on a seven-point Likert scale. In this study, a four-point scale was used, as three or four point Likert scales are recommended because larger ones can be difficult for an individual with mental retardation to interpret (Heal & Sigelman, 1996; Schalock, 1996; Schalock, 1997). On this adapted version, total possible scores range from 25 to 100, with higher scores indicating higher levels of perceived social support. This adaptation is a potential threat to the validity of the measure; however, a rating scale that respondents are unable to understand and utilize properly poses an even greater threat.

Alpha coefficients for the original PRQ – 85 range from .87-.90 (Weinert, 1987). Validity was measured by examining its relationship with two measures of family integration, the Family Functioning Index and the Marital Adjustment Scale. The correlation coefficients for part 2 of the PRQ – 85 ranged from  $r=.30$  to  $r=.41$ ,  $p < .001$ . A study by Weinert and Tilden (1990) measured the PRQ – 85's validity by examining its relationship with the Cost and Reciprocity Index, and found correlations ranging from  $r=.53$  to  $r=.58$ . This evidence supports the validity of the original form of the PRQ-85 as a measure of perceived social support.

*Psychological health.* Psychological health was measured using the Anxiety, Depression, and Mood Scale. The Anxiety, Depression, and Mood Scale (ADAMS) was specifically designed to comprehensively screen for anxiety, depression, and mood disorders in persons with mental retardation (Esbensen, Rojahn, Aman, Ruedrich, 2003). It is a 28-item instrument scored on a four-point scale that was carefully developed in collaboration with psychologists and psychiatrists and was based on DSM-IV criteria, previously validated assessment instruments, and clinical assessment of individuals with mental retardation. It consists of five subscales: Manic/Hyperactive Behavior, Depressed Mood, Social Avoidance, General Anxiety, and Compulsive Behavior. It is designed to be completed by a staff member who has known the individual for longer than 6 months.

Test-retest reliability coefficients (measured over four weeks) for the subscales ranged from  $r = .72$  to  $r = .83$ , with a mean of  $r = .78$  (Esbensen, Rojahn, Aman, Ruedrich, 2003). The test-retest reliability coefficient for the whole scale was  $r = .81$ . Alpha coefficients ranged from  $r = .75$  to  $r = .83$ , with a mean of  $r = .80$ . Inter-rater reliability for the subscales ranged from  $r = .37$  to  $r = .62$ , with a mean of  $r = .48$ . The inter-rater reliability score for the entire scale was  $r = .48$ . Validity information was collected by administering the ADAMS to 129 individuals with mental retardation who also have one or more psychiatric diagnoses. In this analysis, the ADAMS proved to be a valid instrument for screening for these diagnoses. The ADAMS appears to be a psychometrically sound screen for anxiety, depression, and mood disorders in individuals with mental retardation.

*Self Determination.* *Self Determination* was measured using subscales from the Minnesota Self-Determination Scales and the Exercise of Control Scale (Abery, Elkin, Smith, Springborg, & Stancliffe, 2000). Total scores of the two scales are provided. The Abery et al. (2000) scales were used because they have demonstrated high test-re-test reliabilities when used with individuals with developmental disabilities.

#### *Data Summarization Procedures*

Means and standard deviations are provided in the tables below.

	QOL- Satisfaction (30 pts possible)	QOL- Competence (30 points possible)	QOL- Empowerment (30 points possible)	QOL- Community Integration (30 points)	QOL- Total (120 points)
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The reliabilities for the subscales were found to be acceptable. Correlations indicate that there was suitable internal consistency demonstrated within subscale items.

### *Statistical Analysis Procedures*

Correlations – Data indicating the amount of time (months) of participation in the Sound Response program are correlated (Person  $r$ ) with each of the dependent measures.

	Time in program (months)	QOL-Sat.	QOL-Comp.	QOL-Empow.	QOL-Comm. Integr.	QOL-Tot	Soc. Suppt	Instru. skills	Interper. skills	Self-Det.	Exerc. of contrl.
Time in Program (Months)	1	.002	.277**	.061	.203*	.150	-.045	-.184	.253*	.04	.070

\* indicates significant at the .05 level

\*\* indicates significant at the .01 level

Correlations indicate significant correlations with time in the Sound Response program (months) with Quality of Life sub-scales – Competence/productivity and Community Integration. Interpersonal skills were also found to be significantly correlated with Sound Response participation. Although these correlations are *not* considered to be strong associations between the independent measure and the dependent measures, given that Sound Response participation is not the type of intervention that would elicit a large effect size, and the sample is relatively small (thus eliciting low statistical power) it is of interest that any significant correlations were found.

### ANOVAs

For the Analysis of Variance (ANOVAs), the independent variable “amount of time (in months) in the Sound Response program” was divided into three groups; participants that joined the program most recently, those who have been in the program a moderate amount of time, and those who have been in the program the longest to ascertain if group differences existed across the dependent measures.

QOL satisfaction - ANOVA results indicated that ( $F [3, 75] = .081, p > .05$ ), Non significant

QOL Competence - ANOVA results indicated that ( $F [3, 75] = 4.23, p = .018$ ), **Significant**

QOL Empowerment - ANOVA results indicated that ( $F [3, 75] = 1.49, p > .05$ ), Non significant

QOL Social belonging - ANOVA results indicated that ( $F [3, 75] = 1.64, p > .05$ ), Non significant

QOL total - ANOVA results indicated that ( $F [3, 75] = 1.14, p > .05$ ), Non significant

Social support - ANOVA results indicated that ( $F [3, 75] = .007, p = .05$ ), Non significant

Instrumental skills - ANOVA results indicated that ( $F [3, 75] = .394, p > .05$ ), Non significant

Interpersonal skills - ANOVA results indicated that ( $F [3, 75] = 4.92, p = .01$ ), **Significant**

Self-determination - ANOVA results indicated that ( $F [3, 75] = 1.79, p > .05$ ), Non significant

Exercise of control - ANOVA results indicated that ( $F [3, 75] = 1.146, p > .05$ ), Non significant

ANOVA results reveal that Sound Response participants that have been in the program for longer periods of time do demonstrate higher scores on measures pertaining to their Quality of life – competence and Productivity and interpersonal skills. However, ANOVA analyses indicated non-significant results for all of the other dependent measures.

## **Fiscal aspects**

### *Cost Calculations*

The cost of participating in the Sound Response program is typically \$7000. The actual cost is determined by the participant's support broker and the Dane County Human Services supervisor. The cost of equipment is determined by the Sound

Response program and supporting members of the participant's team. The person referring the potential participant to the Sound Response program can apply for CIP funds to assist with the cost of the equipment. The typical cost of a minimum install of Sound Response equipment, is \$800-\$1,000; this includes a smoke detector, a Main Street Messenger Unit, a personal pager, and individually adapted equipment. As previously documented, one residential agency supervisor specified that when a consumer entered the Sound response program, the residential rates for that consumer were reduced by \$7,800 person.

Data received from the Dane County Developmental Disability Services are presented in the Table below.

### Sound Response Calculations

<b>Expenses</b>		
	Current Costs:	\$ 671,244
	Current Households:	83
	Cost/Household	\$ 8,087

<b>Savings</b>		
	Hours/Weekend	16
	Average Unit rate	\$ 23.00
	Weekly Savings	\$ 368.00
	Annual Savings	\$ 19,136.00

Note regarding Hours/Weekend savings calculations: Most Sound Response participants, prior to being supported by Sound Response, used a "live-in" model for residential services. The "live-in" model utilized a staff person living in a home with the person(s) with a disability. The "live-in" model did not pay staff to actively sleep but provided room and board and sharing of expenses. However, the staff that were the "live-in" staff, only worked from Sunday nights through Thursday nights. This model, although probably the most economical at the time, left the residential providers with the obligation of providing shift staff (paid at an hourly rate) to support the individuals during the weekend hours. Sound Response provides support from 9:00pm-7:00am.

The savings, at an average cost of \$23.00 per hour, with the utilization of Sound Response supports, for weekends only, would be \$23.00 per hour x 16 hours (minimum) per week x 52 weeks per year for a grand total savings of at least \$19,136.

<b>Savings not calculated</b>		
	Week day hours	\$
	Smaller Apt. need	\$
	Cost of recruitment/training	\$
	Overtime coverage during staff shortages	\$

\$ = Although monies saved are consistently reported to be substantial by agency administrators and county administrators, we are not able to calculate true fiscal savings.

Minimum return	\$ 11,048.73
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This “minimum return of \$11,048 per household (83) represents a savings of **\$917,044.59** for Dane County in a fiscal year. Note: as indicated in the above table, cost savings for agencies not paying for weekday hours, overtime (weekend nights), and cost of recruitment and training is not calculated in these figures. In addition, many consumers realize monthly savings due to the fact that a larger apartment is no longer needed because live-in staff are no longer required to sleep over.

## **Conclusions**

There is a continuing interest from other networks throughout Wisconsin and other states as well as the Dane County Aging network to utilize the Sound Response system. It is anticipated that the Sound Response system will continue to grow significantly in light of current funding cutbacks. It provides both an increase in individual choice and freedom while providing a cost efficient measure of protection and safety.

Positives that were consistently reported in the qualitative interviews were:

- Fiscal savings for consumers, the county and the agency
- Increased consumer independence (this was borne out minimally in the statistical analyses, but a predominate theme in the interviews)
- General consumer and stakeholder satisfaction

The qualitative interview highlighted the importance for Sound Response administration and staff to continue to provide the human contact with all program stakeholders. Most interview comments were generally very positive. However, concerns regarding the following were voiced:

- Ambiguous and inconsistent criteria for program eligibility (importantly, each of the administrators that mentioned this did say that having a uniform and specific criteria may be counter-productive because the needs of each consumer are so unique and necessitate individualized consideration).
- Response capacity in case of a wide-spread disaster
- Criteria for eligibility driven by fiscal savings when Sound Response may not be the safest service mechanism for a given consumer

### *Statistical Analyses*

The statistical analyses (both correlations and ANOVAs) indicated that the longer they participated in the Sound Response program participants' scores increased their competence productivity as measured by the QOL Competence/Productivity scale and their Interpersonal skills as measured by the Socialization, Social Behavior, and Disturbing Interpersonal Behavior scales of the Adapted Behavior Scale. In addition, the correlation for community integration as measured by the QOL Community Integration scale indicated a significant relationship exists between time in program (SR) and community integration.

Importantly, although only several of the dependent measures demonstrated significant participant gains, *no* measures were found to be significant in a negative direction. Indicating that, although service costs were lowered and night staff-time was decreased, no detrimental effects were found. Thus, involvement in SR services did not adversely affect participants. These finding may suggest that the attempts made to provide the human contact through itinerant and remote communication have proved to be successful.

These results should be interpreted cautiously. Particularly, the significant ANOVA results should be interpreted cautiously due to the fact that several (10) ANOVAs were run to ascertain the effects of SR program participation on the dependent measures. When several ANOVAs are conducted in one study, it inflates the possibility of committing a type one error (finding results when none actually exist). However, it is also possible that actual population differences do exist on some of the non-significant measures across long term participants versus those who have only been in the program a short time, and the present analyses were unable to detect such differences. This would be primarily due to the low statistical power and the expected low effect size of the intervention (SR participation). Future longitudinal research with SR program participants will help to clarify these results.

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