

# Benefits of Assistance Dogs: A Review

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**ABSTRACT.** *Objective:* To review outcome research concerning placement of trained assistance dogs (ADs), focusing primarily on service dogs for people with mobility impairments and hearing dogs for individuals who are deaf or hard of hearing. *Design:* The authors place the relatively small body of literature on ADs in the context of relevant research on the benefits of human–animal contact and pet ownership. *Results:* While the research specific to ADs generally shows positive benefits, the small number of studies and methodological limitations of these studies preclude any clear conclusions. Recommendations for future research on ADs include the use of longitudinal designs, matched comparison groups, standardized measures that assess diverse areas of functioning, and behavioral self-monitoring for daily activities.

With the passage of the *Americans with Disabilities Act* (ADA, 1990), there has been an increase in the use of assistance dogs (ADs), which are trained and placed for the purpose of reducing the impact of disabling conditions. While the number of individuals partnered with ADs does not yet represent a substantial

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proportion of people with disabilities, throughout the past 25 years the use of ADs for disabilities other than vision impairment has grown considerably (Beck, 2000). In the following review, research on the benefits of ADs is surveyed and critiqued.

Different terms are used to refer to dogs in relation to their training or purpose (Eames & Eames, 1997a). Family pets are often referred to as *companion animals*, and *assistance dogs* (ADs) is a general term that refers to dogs that are specially trained to assist individuals with disabilities. The most common type of AD is *guide dogs* (GDs) trained to help individuals who are blind or vision impaired. The present review focuses on two other types of ADs: *service dogs* (SDs), which assist people with mobility impairments, and *hearing dogs* (HDs), which assist individuals who are deaf or hard of hearing.<sup>1</sup>

Individuals who obtain SDs have such conditions as spinal cord injuries, multiple sclerosis, muscular dystrophy, cerebral palsy, polio and postpolio syndrome, and acquired brain injuries. SDs generally have two main functions: to enhance the individual's mobility and to retrieve objects. SDs are taught such tasks as pulling wheelchairs, opening doors, turning light switches on and off, getting the phone, and picking up various objects (Lane, McNicholas, & Collis, 1998). For ambulatory people with mobility impairments, SDs may assist with bracing as the person stands up and with balance during ambulation. In these ways, SDs reduce the expenditure of time and physical exertion by the person or a caregiver, allowing them a more efficient use of resources (Cusack & Smith, 1984).

Individuals who are deaf or hard of hearing are often unaware of important sounds. This circumstance may adversely affect the individual across several domains of functioning. HDs are trained to alert individuals to such sounds as a knock at the door, the telephone ringing, smoke and fire alarms, the microwave oven, an alarm clock, an intruder, a baby crying, or someone calling their name (Mowry, Carnahan, & Watson, 1994).

## BACKGROUND OF ADs IN THE UNITED STATES

The first AD training program in the United States, founded in 1929, was Seeing Eye, Inc., which trained GDs for individuals who were blind. However, the use of specially trained dogs to assist individuals who have a disability other than blindness had its beginnings about 25 years ago. In the mid-to-late 1970s, programs were initiated to train SDs for individuals with mobility impairments and to train HDs for individuals who were deaf or hard of hearing (Bergin, 1981,

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<sup>1</sup> There are an increasing number of dogs being trained to assist individuals with a range of disabilities, including seizure disorders, Parkinson's disease, heart disease, and psychiatric disorders. Sometimes these dogs are referred to by their function (e.g., seizure response dog), and sometimes they are simply referred to as service dogs.

2000). Informal surveys suggest that there are currently 10,000 to 16,000 individuals who have ADs (Beck, 2000; Duncan, 1998; Hines, 1991).

Within the United States, the two largest SD and HD agencies are Paws With a Cause® (PAWS®) and Canine Companions for Independence (CCI). Each of these programs trains approximately 100 ADs every year. There are more than 48 regional programs that train SD or HD. A list of AD providers who are members of Assistance Dogs International (ADI) can be found on the ADI web site (<http://www.assistance-dogs-intl.org>).

Most AD training programs are nonprofit organizations that provide ADs at no charge to the individual. The cost of training an SD has been estimated between \$12,000 and \$20,000 (Duncan, 1998). The cost of training an HD is approximately \$5,000 (Mowry et al., 1994). GD schools have a history of endowment, and therefore individuals wanting a GD and meeting the requirements are usually able to obtain a GD within one year of the request (Eames & Eames, 1994). However, there are few public funds available for SDs or HDs, and no private insurance companies are known to cover the costs. Some states provide funding for the acquisition and maintenance of ADs through their vocational rehabilitation and social security income programs (Froling, 1995a, 1995b). Because of funding limitations, individuals often have to wait two or more years to obtain an SD or HD.

### **AN ORGANIZING FRAMEWORK IN WHICH TO EXAMINE AD BENEFITS**

The purpose of placing trained ADs is to reduce the impact of disabling conditions on the day-to-day lives of individuals across a variety of domains (e.g., health, mobility, mood, social interaction, and employment) and situations (e.g., at home, in a store, or at a friend's house). The review of outcome research interventions, and the planning of future research, can best be considered within a model of functioning and disability with elements encompassing the range of life areas potentially affected by disabling conditions and by interventions. The World Health Organization (WHO) in the *International Classification of Impairment, Disability, and Handicap (ICIDH-2; World Health Organization, 1999)*<sup>2</sup> provides such a model, which invites the study of functioning and disability at three levels: body, activity, and participation.

According to the *ICIDH-2*, after the onset of a disabling condition a person's functioning at each of the three levels may be facilitated or hindered by features of the environment and by the person's own unique set of attributes. At the body level, functioning is considered in terms of the integrity of body functions (e.g.,

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<sup>2</sup> This model of functioning and disability is named in recognition of the previous and widely used WHO model, the international classification of impairment, disability, and handicap, although this nomenclature is not retained in the new model.

movement or hearing) and body structures (e.g., limbs or ears); *impairment* is the term reserved for problems in these areas. At the activity level, the performance of whole-person activities is considered, such as communication, eating, or ambulation; *activity limitation* is the term for problems at this level. At the participation level, the person's involvement in normative life situations is considered, such as education, employment, or parenting; problems at this level are termed *participation restrictions*. Internal and external contextual factors, including the person's physical and social environments as well as the person's own attributes, may enhance or hinder functioning at any or all three levels. Internal contextual factors include such variables as the psychological functioning of the individual, and external contextual factors include such variables as accessibility, availability of resources, and behaviors of other people encountered by the individual with a disability. The WHO model is summarized in Table 1.

## THE RESEARCH

### Research on Animal Contact and Ownership

While there are few studies on ADs, there is a growing body of research showing that contact with animals and pet ownership (companion animals) can be beneficial to humans (Jennings, 1997). These studies have examined the benefits of companion animals in general population samples and in samples at high risk for psychosocial or health problems such as older adults, widowed individuals, and those with medical problems. Because the benefits of dog contact or ownership found in these samples, particularly the high-risk samples, will also likely apply to individuals with a disabling condition who have obtained a trained AD, this work is reviewed in conjunction with the work on ADs.

Many of the theories examining the impact of dogs on humans discuss the importance of the human–animal bond. For example, Katcher (1983) identified four elements of the human–animal bond: *safety*, *intimacy*, *kinship*, and *constancy*. Friedmann (1990) postulated that pet ownership leads to the following benefits: (a) improved fitness by providing a stimulus for exercise, (b) decreased anxiety by providing a source of physical contact, and (c) decreased loneliness by providing companionship. McNicholas and Collis (2000) suggested that the presence of a dog is beneficial for two reasons: (a) the dog facilitates social interactions with other people and (b) the relationship between the individual and the dog (Collis & McNicholas, 1998) is similar to human-to-human relations (Bonas, McNicholas, & Collis, 2000). In their review, Garrity and Stallones (1998) concluded that the positive impact of dogs on humans is consistent with the literature on the benefits associated with human social support.

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**Table 1.** Overview of Components of ICIDH-2

	Body (B)	Activities (A)	Participation (P)	Contextual factors (interact with B, A, and P)
Level of functioning	Body (its parts)	Individual (person as a whole)	Society (life situations)	Environmental factors (external influence on functioning) + personal factors (internal influence on functioning)
Characteristics	Body function (e.g., sensory processing, muscle strength) Body structure (e.g., eyes, limbs)	Individual's performance of activities (e.g., get dressed, go through doorways)	Involvement in life situations (e.g., employment, education, personal relationships)	Features of the physical, social, and attitudinal world + attributes of the person

Note. From *ICIDH-2—International Classification of Functioning, Disability and Health* (World Health Organization, 1999).

## Description and Critique of AD Research Methodologies

There have been a variety of methodological designs used to examine the affects of AD on humans. Because some designs are scientifically more valid than others (see Campbell & Stanley, 1966), it is important to take into consideration the methodologies used when evaluating research findings. *Retrospective, no control group designs* rely on individuals' memory about perceptions of life changes since obtaining an AD and typically do not use standardized measures of change. Because there is no comparison group, reported changes may be due to other factors such as simply the passing of time. *Cross-sectional studies* examine differences between individuals who have an AD and those who do not. Comparison groups are typically made up of individuals on a waiting list to obtain an AD. However, there may be systematic differences between individuals who have obtained an AD and those still on the waiting list that may account for any observed differences. *Longitudinal studies* with appropriate comparison groups can chart changes over time and have the most promise for detecting any true benefits from obtaining an AD. This type of research is expensive to conduct. To date, there have been only three longitudinal studies of individuals partnered with ADs. Two of the three studies used a relatively short time frame, had small sample sizes, and one of the two studies had no comparison group, thus limiting the interpretation and generalizability of their findings.

Allen and Blascovitch (1996) published the third longitudinal study. This 2-year longitudinal study has a strong scientific design and is the only study in the AD field, thus far, that has used random assignment. Additionally, the researchers used a diverse set of standardized measures. Their results indicated that after obtaining an SD, participants showed dramatic positive changes across an array of different psychosocial, vocational, and health functioning variables. However, the authenticity of this study has repeatedly been challenged (see Allen, 1996; Beck, 2000; Eames & Eames, 1996, 1997b, 1998a, 1998b; Rowan, 1996). Reasons for the controversy include the absence of certain important methodological details, stunning response rate, and magnitude of effect sizes that defy logic. As a result, this study is not reviewed further.

### Summary Tables

To assist the reader, Table 2 summarizes outcomes of studies examining pet contact and companion animals, organized within the context of the WHO model. Table 3 provides a summary of each study on ADs reviewed in this article, including type of AD, the AD school that participated in the study, sample size and response rate, outcome measures included in the study, and the study's limitations. Table 4 summarizes outcomes of the studies on AD, which is also organized within the context of the WHO model.

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**Table 2.** Summary of Reported Benefits of Pet Ownership and Contact

Body (B)	Activities (A)	Participation (P)	Contextual factors
Lower blood pressure	Less deterioration of activities of daily living in elderly people	Improved safety	External factors
Decreased heart rate			Increased social acknowledgment
Slower respiration	Increased physical activity		Perceived as more:
Lower triglyceride & cholesterol levels			Friendly
Decrease in minor health complaints			Attractive
Increased survival rates among individuals with heart disease			Approachable
Fewer physician visits			Internal factors
Fewer medications			Less anxious
			Less depressed
			Less lonely

**Table 3.** Summary of Research Studies on SDs and HDs

Author	Type	n	Resp. rate	Design	Measures <sup>a</sup>	Limitation
Rintala et al. (2002)	SD	16 <sup>b</sup>	50	Longitudinal (6 months)	Community integration, FIM, CES-D, CHART, Rosenberg Self-Esteem	No control group, small sample, low response rate
Fairman & Huebner (2001)	SD	202 <sup>c</sup>	51	Retrospective, no control group	Tasks, dog problems, psychosocial, economic, attendant care	No control, nonstandard measures, low response rate
Pang (1999)	HD	21 <sup>d</sup>	70	Retrospective	Descriptive questions, psychosocial	No control group, nonstandard measures, small sample
Lane et al. (1998)	SD	57 <sup>e</sup>	90	Retrospective	Health, psychosocial	Nonstandard measures, no control group
Allen & Blascovich (1996)	SD	48	100	Experimental, random assign, longitudinal (2 years), control group	Community integration, locus of control, well-being, Rosenberg Self-Esteem, affect balance, vocational, marriage	Validity of research challenged
Donovan (1995)	SD	52 <sup>c</sup>	—	Longitudinal (4 months), control group, pre- & posttest	CES-D, RAND Form, Attitudes of Disability, Coopersmith Self-Esteem	Short time frame
Rushing (1995)	SD	45 <sup>c</sup>	—	Cross-sectional, control group	Tennessee Self-Concept	One standard measure
Hart et al. (1995, 1996)	HD	61 53 <sup>d</sup>	54	Cross-sectional, control group	Psychosocial, Dog tasks & satisfaction, awareness of sounds	Nonstandard measures

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**Table 3.** (continued)

Author	Type	n	Resp. rate	Design	Measures <sup>a</sup>	Limitation
Hackett (1994)	SD	40 <sup>f</sup>	67	Cross-sectional, control group	ISE, demographics	One standard measure
Mowry et al. (1994)	HD	455 <sup>g</sup>	87	Retrospective	Tasks, dog problems, satisfaction, health, psychosocial benefits	Nonstandard measures, No control group
Marks (1993)	SD	64 <sup>c</sup>	64	Cross-sectional, control group	Tennessee self-concept, demographics, vocational, health status	One standard measure
Valentine et al. (1993)	SD	10 <sup>h</sup>	62	Retrospective	Psychosocial benefits	Nonstandard measure, small sample, no control group
Roth (1992)	SD	46 <sup>c</sup>	34	Retrospective	Life satisfaction, dog tasks, descriptive	Nonstandard measures, no control group, low response rate

Note. Dashes indicate data not available. SD = service dog; HD = hearing dog; FIM = Functional Independence Measure; CES-D = Center for Epidemiologic Studies Depression Scale; CHART = The Craig Handicap Assessment and Reporting Technique; ISE = Index of Self-Esteem.

<sup>a</sup> Citations for standardized measures are listed in the reference section; specifically, Bradburn, 1969; Crewe & Dijkers, 1995; Paulhus, 1983; and Willer, Ottenbacher, & Coad, 1994. <sup>b</sup> Dogs trained by Texas Seeing and Hearing Dogs. <sup>c</sup> Dogs trained by Canine Companions for Independence. <sup>d</sup> Dogs trained by San Francisco Society for the Prevention of Cruelty to Animals. <sup>e</sup> Dogs trained by Dogs for the Disabled. <sup>f</sup> Dogs trained by Paws With a Cause®. <sup>g</sup> Dogs trained by five hearing dog schools. <sup>h</sup> Dogs trained by South Eastern Assistance Dogs.

**Table 4.** Summary of Reported Benefits Specific to Service Dogs and Hearing Dogs

Body (B)	Activities (A)	Participation (P)	Contextual factors
Retrospective reports	Reports of individuals partnered with AD	Retrospective reports Increased	Retrospective reports Increased
Provide general health benefits	Alerts to important sounds Retrieves objects Performs numerous tasks	Job and school performance Ability to do household chores	Self-esteem Social network and improved relationships Independence Life satisfaction
Assist with health maintenance	Obtains communication devices Performs emergency responses Aids in dressing, grooming, eating, and toileting	Access in home and community Shopping Safety Family functioning	Decreased Stress Anxiety Loneliness Depression
	Contradictory results (one study observed positive outcomes, one study did not) Change in use of paid and unpaid attendant care	Cross-sectional designs: No significant differences Employment	Studies using observational designs Increased social acknowledgment
	Retrospective reports: Difficulties associated with AD Problem behaviors of dog Caring for daily needs of dog Challenges to access	Retrospective reports: Difficulties associated with AD Problem behaviors of dog Caring for daily needs of dog Challenges to access	Cross-sectional and longitudinal designs No reliable difference observed Self-concept Contradictory results (one study observed positive outcomes, one study did not) Self-esteem Depressive symptoms

Note. AD = assistance dog.

### **Body: Effects at the Physical Level of Functioning**

Research has shown that individuals may experience immediate physiological consequences from simply touching an animal, particularly a dog (Jennings, 1997). Several studies have found that simply stroking a dog decreases physiological arousal, including lowered blood pressure (Katcher, 1985; Katcher, Friedmann, Beck, & Lynch, 1983; Vormbrock & Grossberg, 1988), decreased heart rate and slowed respiration (Lynch, Fregin, Mackie, & Monroe, 1974), and increased finger temperature (Schuelke et al., 1991). Consistent with the theories of the human–animal bond, the effect of lowered blood pressure has been found to be greater when petting a dog with whom a relationship has been established (Astrup, Gantt, & Stephens, 1979; Baun, Bergstrom, Langston, & Thoma, 1984; Schuelke et al., 1991).

If just touching a dog can have such a remarkable impact, what are the long-term effects of pet ownership? Several large general population studies have found a positive relation between pet ownership and health. Pet owners (mostly of dogs) were found to have lower blood pressure, lower triglyceride levels, and lower cholesterol (Anderson, Reid, & Jennings, 1992), as well as fewer doctors' visits and less medication use (Headey, 1999). Serpell's (1991) longitudinal study found that new dog owners show a decrease in health complaints and an improvement in general health. In addition, among individuals with low social support (Garrity, Stallones, Marx, & Johnson, 1989), dog ownership was associated with better physical health.

Among individuals at increased risk for health and psychological problems (e.g., older adults and recently widowed individuals), research has shown that dog ownership may reduce health problems, physician visits, and medication use (Akiyama, Holtzman, & Britz, 1986; Siegel, 1990). Furthermore, dog ownership may be a buffer between stressful life events and the subsequent utilization of physicians (Siegel, 1990). Longitudinal studies have found that pet ownership may enhance survival in individuals with such serious illnesses as myocardial infarction or severe angina (Friedmann, Honori, Lynch, & Thomas, 1980; Friedmann & Thomas, 1995). Lifestyle differences between pet owners and nonowners may account for differences in health status. Surveys have found that dog owners engage in more physical activity than nonowners (Headey, 1999; Raina, Walter-Toews, Bonnett, Woodward, & Abernathy, 1999; Serpell, 1991). However, not all studies of pet ownership have shown enhanced health status. For example, Lago, Delaney, Miller, and Grill (1989) found no differences in health functioning between pet owners and nonowners among older rural residents. In addition, Headey's (1999) and Robb and Stegman's (1983) retrospective study of older veterans found no association between health and dog ownership.

There has been little research examining the impact of an AD on health. Mowry et al. (1994) conducted a large retrospective study of individuals who were partnered with an HD. Among those who reported that their health was problematic (69%), most reported that the HD had helped with their health (86%). However, no specific details were provided as to how health was im-

proved. Fairman (1998) and Fairman and Huebner (2001) conducted a large retrospective study of individuals who had obtained an SD from CCI. The majority of participants indicated that their SD assisted them with health maintenance (59.4%), including physical fitness, nutrition, and decreased health risk behaviors. Some participants (18%) reported that their SD assisted them with oral hygiene, including getting supplies and actual procedures. Lane et al. (1998) conducted a retrospective survey of individuals partnered with an SD from a program in England. Almost half (47%) reported that their health had improved despite the fact that most had degenerative illnesses. However, in a cross-sectional study, Marks (1993) found no difference between the health ratings of individuals who had obtained an SD from CCI compared with individuals on the waiting list. To date, there have been no studies that examined the impact of ADs on physician visits, medication use, or health-care costs.

### **Activity: Effects at the Level of Individual Performance**

The impact of pet ownership and ADs on activity is typically discussed in terms of its implications for activities of daily living (ADL). For example, in a large sample of older, nondisabled adults there was more deterioration found in ADL among the non-pet owners than among the pet owners during a 1-year period (Raina et al., 1999). Research outcomes regarding the extent to which ADs help individuals with disabilities perform ADL are reviewed in the remaining portion of this section.

For individuals who are deaf or hard of hearing, sound awareness is of crucial importance in many areas of ADL. Several studies have documented that HDs increased individuals' awareness of different sounds. Among participants in Mowry et al.'s study (1994), more than three quarters indicated that their HD performed satisfactorily in alerting them to the following sounds: door knock, alarm clock, smoke alarm, phone, name called, baby crying, oven timer, tea kettle, and burglar alert. The frequency with which these tasks were performed on a daily basis was not reported. Hart, Zasloff, and Benfatto (1996) conducted a cross-sectional study of individuals partnered with an HD and individuals on a waiting list to obtain an HD from the San Francisco SPCA (Society for the Prevention of Cruelty to Animals). Respondents reported that their HD fulfilled their primary expectation of alerting them to sounds, including doorbell, smoke alarm, and alarm clock. Researchers asked the participants to retrospectively rate their awareness to each of these sounds before and after obtaining an HD. Respondents reported that they were more aware of these sounds since obtaining an HD. Moreover, the waiting list participants reported being aware of each of these sounds less often than those partnered with an HD.

Fairman and Huebner's (2001) respondents identified the ADL for which their SDs assisted them. These activities included getting around the community (84%), getting around the house (78.2%), obtaining communication devices (72%), dressing (48%), grooming (44%), emergency responses (43%), bathing

(20%), feeding self (18%), and toileting (18%). In Roth's (1992) retrospective survey, respondents reported that their SD, also trained by CCI, assisted them with eating (22%), dressing (20%), retrieving the phone (20%), and grooming (17.4%). When asked to list the most important task that their SD performed, respondents in several studies identified retrieval of objects (Roth, 1992; Lane et al., 1998; Marks, 1993).

An important, indirect measure of the AD's impact on an individual's ability to perform ADL is changes in paid and unpaid attendant care. Fairman and Huebner's (2001) participants retrospectively reported the amount of care needed from paid and unpaid assistance, before and after obtaining their SD. Participants reported using 2 fewer hours of paid assistance and 6 fewer hours of unpaid assistance each week. Unpaid assistants are often family members. The reduction in demand on family for assistance is likely to have an important impact on decreasing family burden. However, in a cross-sectional study comparing individuals with an SD to those on a waiting list, Hackett (1994) found no significant difference between groups in the use of paid assistants, but it should be noted that the actual data from this study were not reported and there was no assessment of unpaid assistants.

### **Participation: Effects at the Level of Society and Life Situations**

In the WHO model, participation is a multifaceted category, the outcomes of which rest on the person's functioning at the body and activity levels and contextual factors. Participation in life situations or social roles depends on *access*—both social and physical. Fairman and Huebner (2001) asked participants whether their SD assisted them in a variety of activities relevant for participation in social roles. Respondents indicated that their SD assisted them with shopping (76%), cleaning (55%), clothing care (40%), household maintenance (33%), care of others (22%), leaving their home (77%), and using community resources (72.5%). Roth's (1992) respondents reported that their SD assisted them with general shopping (69%), grocery shopping (50%), and banking (28.3%). The specific mechanisms by which the SD facilitated these tasks were not identified in either study. In Pang's (1999) retrospective study, only 33.3% of participants felt comfortable traveling away from home before they had an HD, whereas 85.7% did so after obtaining their HD.

**Safety of environment.** Perhaps one reason that individuals partnered with an AD feel more comfortable using community resources and traveling away from home is that the AD makes them feel safer. Even in studies of individuals without disabilities (Serpell, 1991), new dog owners reported a significant reduction in fear. In Mowry et al.'s (1994) large study, almost all (95.3%) of the participants reported experiencing problems in security or safety in their home and community, and 91% reported that their HD had helped a lot with these concerns. Only 9.5% of Pang's (1999) participants felt safe in their environment before obtaining an HD, and 95.2% agreed that they felt safe after receiving their

HD. The vast majority of Fairman's (personal communication, February 2001) respondents (91%), as well as Valentine, Kiddoo, and LaFleur's (1993) participants (92%), indicated that they felt safer since obtaining an AD.

**Employment.** Among Roth's (1992) sample, 50% reported that they were employed (part or full time), and 82.6% of these participants reported that their SD assisted them at work. Fairman and Huebner's (2001) participants indicated that their SD assisted them in work (46%) and school activities (22%). However, no specific assessment of how the dog assisted was obtained. Among Mowry et al.'s (1994) participants, 44.3% reported being employed; of these, 62.6% took their HD to work. Participants reported that at work their HD assisted them in alerting them to sounds similar to those at home.

Although 23% of Marks's (1993) respondents reported that their SD was essential for them to work or attend school, she did not find the difference in employment status of individuals partnered with an SD (40.6%) and those on the waiting list (32.1%) to be statistically different.

Hart et al. (1996) found that 57% of individuals partnered with an HD were employed compared with 46% of the waiting list sample; this difference was not statistically significant. In a cross-sectional study, Hackett (1994) found no significant difference in the employment status of individuals partnered with an SD trained by PAWS<sup>®</sup> and those on the waiting list, although she did not report the percentage of individuals in each group that was employed.

Rintala, Sachs-Ericsson, and Hart (2002) conducted a longitudinal study of individuals before and 6 months after obtaining an SD from Texas Service and Hearing Dogs. However, they did not have a comparison group. Using the Craig Handicap Assessment and Reporting Technique (Whiteneck, Charlifue, Gerhart, Overholser, & Richardson, 1992), participants reported positive changes in productive use of time; however, this effect did not reach statistical significance.

These studies suggest a trend in increased employment among those with an AD. However, sample sizes for these studies were small and, therefore, may have lacked the necessary power to determine if obtaining an AD has a significant positive impact on employment.

### **Internal Contextual Factors: Effects on Attributes of the Person**

The literature on contextual factors is considered in two sections: (a) whether companion animals or ADs bring about changes in the psychological functioning of the individual and (b) whether companion animals or ADs bring about changes in the external environment, including behaviors of other people as well as available resources.

**Companion animals and psychological functioning.** There is an extensive, though uneven, body of literature on the psychological benefits of pets. However, it is often impossible to distinguish possible effects of pet ownership from preexisting differences that may lead some people toward, and other people away from, acquiring a pet. Are there preexisting psychological differences between

pet owners and nonowners? Results from studies addressing this issue have been equivocal, with a minority of investigators even concluding that pet owners have more psychological problems than do nonowners (Cameron, Conrad, Kirkpatrick, & Bateen, 1966; Cameron & Mattson, 1972; Guttman, 1981). In contrast, there are a number of studies that indicate a positive relation between pet ownership and psychological functioning (Akiyama et al., 1986; Serpell, 1991), but several studies have found no such relationship (Friedmann, Katcher, Eaton, & Berger, 1984; Johnson & Rule, 1991; Kidd & Martinez, 1980; Lawton, Moss, & Moles, 1984; St-Yves, Freeston, Jacques, & Robitaille, 1990; Watson & Weinstein, 1993; Wilson, 1991).

The ability to become attached to a dog may be related to the decision to have a companion animal or an AD. Studies have found individual differences in the extent to which individuals are attached to their pets, and these differences in attachment may affect the psychological impact of the pet on the individual (Brown, Shaw, & Kirkland, 1972; Garity, Stallones, Marx, & Johnson, 1989; Joubert, 1987; Miller, Staats, & Partlo, 1992; Ory & Goldberg, 1983).

Although the literature is uneven, we must keep in mind that there may be preexisting psychological differences between individuals who choose to have a dog and those who do not. Possible preexisting differences should be kept in mind when interpreting results of these studies.

Retrospective reports have strongly suggested that ADs have a positive psychological impact on the majority of individuals partnered with an AD. Fairman and Huebner's (2001) respondents reported that they were more in control of their lives (83%), more independent (88%), felt better about themselves (75%), participated in more activities (80%), were better able to manage stress (77%), and had increased confidence (81%). Lane et al.'s (1998) participants reported that since obtaining an SD they relaxed more (69%) and worried less about their health (52%). Roth's (1992) participants reported that they took more risks (54.3%), felt more in control of their lives (78.3%), and were more accepting of their disabilities (45.7%). Moreover, while only 26.1% reported experiencing high life satisfaction before obtaining an SD, 71.1% reported high life satisfaction after obtaining an SD.

Valentine et al. (1993) retrospectively surveyed individuals partnered with an SD or HD (trained by South Eastern ADs). SD participants reported experiencing higher self-esteem (80%), more confidence (70%), more assertiveness (80%), more contentment (80%), feeling more capable (100%), having better control of anxiety (70%), feeling less lonely (90%), feeling less depressed (70%), and feeling less irritable (70%). The HD respondents reported being more independent (79%), feeling healthier (79%), and being more active (64%). In addition, Pang's (1999) respondents reported an increase in confidence, acceptance of their disabilities, and quality of life since obtaining an HD.

In Mowry et al.'s (1994) large study, at least 60% or more of the HD participants reported having problems with the following areas: depression, social life, self-confidence, independence, loneliness, relaxation, or companionship. Most reported that the HD helped a lot in each problem area (from 61%

helping with depression to 87% with companionship). In an open-ended format describing the “good things about having an HD,” the most frequently cited answer was some aspect of the HD’s alerting response to sounds (31.2%). However, companionship (29.7%) was the next most frequent response. Participants emphasized the dog’s affection and the bond between them and the dog, and many said they no longer felt lonely.

In a cross-sectional study (Hart et al., 1996), those partnered with an HD and those on the waiting list did not differ on the number of stressful life events experienced. However, those partnered with an HD reported experiencing less stress from these events. HD participants also reported less loneliness than the comparison group. In addition to the companionship that individuals may experience from having an AD, the decrease in loneliness may be related to changes in their social interactions with others. Hart and her colleagues found that among those participants with an HD, 75.6% reported the HD had positively influenced their interactions with the hearing community.

Cross-sectional studies of individuals partnered with an AD that assessed changes in participants’ self-concept or self-esteem and used standardized measures have generally not found significant results. This may be due, in part, to factors such as the methodology used, the specific measures used, sample size, and the length of time the participants had their AD. A cross-sectional waiting list comparison study by Hackett (1994) found that levels of self-esteem measured by the Index of Self-Esteem (Hudson, 1982, 1992) did not distinguish individuals partnered with SDs from individuals on the waiting list. However, the author pointed out that 43% of the respondents had their SD for less than a year, while having their disability, on average, for 15 years. A cross-sectional study (Rushing, 1995) of self-concept comparing individuals with quadriplegia who had obtained an SD from CCI to those on the waiting list found no differences between the two groups in self-concept (measured by the Tennessee Self-Concept Scale [TSCS]; Roid & Fitts, 1988). The author suggested that this was due, in part, to the homogenous nature of participants and that the measure used to assess self-concept may not be sensitive enough to measure subtle subjective and affective issues. In a cross-sectional study using the same measure of self-concept (TSCS), those having an SD scored higher than the waiting list respondents; however, the difference was not significant (Marks, 1993).

A pre- and posttest, 4-month longitudinal study (Donovan, 1995) examined differences between individuals who had just received their SD from CCI to individuals on a waiting list, matched for age and gender. The groups were assessed on measures of depression (Center for Epidemiologic Studies Depression [CES-D]; Radloff, 1977), self-esteem (Coopersmith, 1959), acceptance of disability (Attitudes Toward Disabled Persons scale [ATDP]; Yunker & Block, 1996), and quality of life (RAND; Sherbourne & Hays, 1991). No differences over time were found for any of the measures, except for the experience of pain, which was accounted for by pretest differences. As the author pointed out, having an SD for only a 4-month period is likely too short a time frame for any substantive change to occur. Interestingly, both the SD and the waiting list

groups had a marginally significant ( $p = .06$ ) increase in depressive symptoms over the course of the study. In contrast, in their 6-month longitudinal study, Rintala et al. (2002) found a decrease in depression (CES-D; Radloff, 1977), although it was not statistically significant. However, they did find the self-esteem (Rosenberg Self-Esteem; Rosenberg, 1979) of SD participants to significantly increase over time.

### **External Contextual Factors: Social and Material Effects**

Disability may contribute to deprivation in social opportunities. For example, although Benschhoff, Fried, and Roberto (1990) found no significant differences between college students with and without disabilities on an array of developmental skills (autonomy, independence, and planning), the former scored lower on skills related to interpersonal functioning. Numerous studies have shown that having a social support network is related to psychological well-being and healthy functioning (Uchino, Cacioppo, & Kiecolt-Glaser, 1996; Vinokur & Van Ryn, 1993). For example, Belgrave and Walker (1991) found that social support predicted vocational functioning among African American individuals with a disability. In addition to the other benefits that an AD may bring to an individual, an impact on social functioning could have broad implications for several areas of the individual's life.

Studies of populations without disabilities have consistently found that the presence of a companion dog increases social interactions (Messent, 1983; Mugford & M'Comisky, 1975; Sanders & Robins, 1991). In many well-designed studies this effect has been found to be quite robust, regardless of the individual's age, gender, or manner of dress (McNicholas & Collis, 2000). There may be something about a person being accompanied by a dog that makes the person more approachable. In a laboratory study, research participants gave higher ratings of happiness and safety to persons pictured with a dog than when shown the same individuals without a dog (Rossbach & Wilson, 1992). Similar results have been found in studies of individuals with disabilities. In several observational studies of individuals with disabilities (adults and children), the presence of an SD was found to increase communication and friendly contact with strangers (Eddy, Hart, & Boltz, 1988; Hart, Hart, & Bergin, 1987; Mader, Hart, & Bergin, 1989).

While individuals with ADs may experience an increase in social acknowledgment from strangers, are there any long-term social benefits? Individuals partnered with an SD have noted, retrospectively, that not only did their social interactions increase but their number of friends increased as well. Fairman and Huebner's (2001) respondents reported that since obtaining their SD more people approached them (100%), their social interactions increased (87%), and their number of friends increased (59%). Lane et al.'s (1998) participants reported that since obtaining their SD, they experienced more people stopping to talk to them (92%), an increase in friends (75%), and a better social life (34%). Roth's (1992)

respondents reported that their SD facilitated social interactions (76.1%) and lead people to be more friendly (85.8%). In Valentine et al. (1993), SD and HD participants also reported experiencing positive changes in social functioning. SD participants reported experiencing more friendliness from strangers (80%), having more contact with friends (60%), having better relations with family (60%), and having a greater sense of belonging (60%). Those with an HD reported experiencing more friendliness from strangers (50%), having better relations with family (29%), and having a greater sense of belonging (36%).

A majority (68%) of participants in Mowry et al.'s (1994) study reported that their social life had been problematic before obtaining an HD. Among those participants, 86% reported that their social life had improved since getting their dog. Only 26.6% of Pang's (1999) respondents reported feeling socially accepted before obtaining an HD; however, 81% reported feeling socially accepted afterward. While three quarters of Hart et al.'s (1996) respondents reported that their HD made a positive change in their interactions with the hearing community, only 26.6% of the waiting list participants anticipated this type of impact on their life. Thus, some individuals may underestimate the social benefits they will receive from obtaining an AD.

### Disadvantages of ADs

Individuals considering obtaining an AD should consider the potential disadvantages of having an AD, including financial costs, responsibilities of caring for a dog, problem behaviors of their AD, and challenges to public access when accompanied by their AD.

**Costs.** There are costs associated with pet ownership, including food and routine veterinary care; if a dog becomes ill, veterinarian costs can be quite substantial. The minimum annual cost of owning a healthy dog, including food and an annual veterinarian visit, was estimated to be \$400 (Masullo, 2000). Among Fairman and Huebner's (2001) SD respondents, 75% reported spending less than \$1,000 on the care and feeding of their SD throughout a 1-year period. Additionally, 32% reported getting some government assistance in the care of their SD. Among Mowry et al.'s (1994) HD respondents, only 7.9% mentioned the financial burden of having a dog as being a problem.

**Behavior problems in ADs.** There are responsibilities associated with having any dog (Albert & Bulcroft, 1987), and even the best trained AD does not always perform tasks reliably. Moreover, ongoing practice with the AD is required to maintain the AD's skill. Using an open-ended format, Roth's (1992) respondents listed problems with their SD, including taking longer to do some things (17.4%), people petting the dog (17.7%), and difficulty maneuvering through small spaces (13.2%). One fourth of Fairman's (personal communication, February 2001) respondents reported having some problems physically maintaining an SD, including clipping nails and bathing. However, her respon-

dents reported rarely having any of the other problem behaviors assessed, such as behavioral problems at home (1.5%) or in public (2.5%).

Mowry et al.'s (1994) HD participants endorsed the following problems: pulling on the leash (23%), barking too much (19%), toileting indoors (8%), and growling and biting (0.3%). In an open-ended format, respondents were asked to list "the bad things" about having an HD; 13% did not write anything and 31.6% stated that they had "no problems." Among those who described a problem, 23.4% listed taking care of the dog, including feeding, grooming, and walking. Among Hart et al.'s (1995) participants, half reported experiencing problems with their HD, but only 13% of the waiting list respondents anticipated having problems. The problems reported included aggression to people or other dogs, barking, and destructiveness. The authors pointed out that the lack of awareness of potential problems may lead to subsequent placement difficulties and even failures.

**Placement failures.** Some partner teams do not work out. This can be a difficult experience for an individual who may have become attached to the dog. In a study of placement success rates of 75 newly trained HDs (Mowry et al., 1994), the overall success rate was only 59.3%. Anecdotal reports from AD training schools have identified various reasons why placements have not worked, including problem behaviors of the dog not apparent during training, poor match between the dog's temperament and skills and the individual's needs, and interference or resentment of family members toward the AD.

**Access problems.** The ADA (1990) grants individuals with disabilities public access (the right to go anywhere that the public is allowed) when accompanied by a dog specially trained to assist them. However, there are numerous anecdotal reports of individuals being denied public access (Duncan, 1996). Some such interactions are brief, requiring minimal education or comments to explain. However, some problems can be quite confrontational and distressing.

Mowry et al. (1994) found that more than one third (36.6%) of their HD participants had experienced some problems with access. Among Fairman and Huebner's (2001) SD participants, 46% reported having problems with access at some point. In Roth et al.'s (1992) study 15.2% reported having problems with access. From a different perspective, ensuring appropriate accommodations for an AD can be challenging in some situations. There are situations such as a hospital setting where there may be legitimate concerns as to whether the presence of a dog may compromise the health and safety of staff or patients (Houghtalen & Doody, 1995).

**Psychological difficulties associated with owning an AD.** One of the most difficult problems that individuals partnered with an AD must face is that of the death of their dog. The loss may be quite similar to the loss of a beloved family member (Arkow, 1993; Cusack, 1988). It can be months if not years before another AD can be integrated into the individual's life (Eames & Eames, 1997a; Ptak, 1994). No investigations were identified that studied short- or long-term psychological effects from the loss of an AD.

## CONCLUSION AND FUTURE DIRECTIONS

Through clinical observation, anecdotal reports, and retrospective and cross-sectional studies, preliminary support was found for the conclusion that ADs have a positive impact on individuals' health, psychological well-being, social interactions, performance of activities, and participation in various life roles at home and in the community. Researchers have, however, relied predominantly on retrospective and cross-sectional studies, subjective ratings, and one-time interviews with individuals after they have received their dogs. Such results provide less convincing support for efficacy than might be provided by large-scale longitudinal studies that compare measures before and after obtaining an AD and that have appropriate comparison groups. Random assignment either to receive or not to receive an AD may be impossible to accomplish because of the costs and ethical issues involved. Therefore, AD outcome research may always be challenged by problems of selection bias. To attempt to control and minimize problems of selection, comparison groups should include individuals matched on relevant variables, such as age, gender, education, and disability. Comparison groups should include individuals who have applied and have been accepted to receive an AD (waiting list individuals) as well as individuals who have not applied to obtain an AD, matched on the relevant characteristics.

Longitudinal studies should be conducted for a sufficient period of time for the efficacy of the ADs to be adequately evaluated. When an individual first obtains an AD, the person and dog must learn to work together as a team and there is an initial adjustment period. Based on anecdotal accounts, it is unlikely to be less than 6 months before any substantial benefits occur.

The benefits of owning an AD are multidimensional, affecting different areas of functioning, and, thus, calling for diverse strategies and targets of measurement. Areas of investigation should initially include those psychosocial and health variables that have been identified by previous studies to improve after obtaining a companion animal or an AD. Researchers should select measures that have been shown in other intervention studies of individuals with disabilities to be sensitive to change. Researchers should avoid measures that are more appropriately characterized as stable personality characteristics or trait measures. The use of standardized measures is encouraged, but participants' direct reports about the frequency of relevant activities, recalled within a recent period of time (e.g., the past 24 hr), are also informative. Ideally, these frequency data would be sampled regularly during a longitudinal study to increase the reliability of measurement and sensitivity to change. A related measurement strategy would be to regularly sample participants' estimates of time required for completion of various ADLs on a given day. Along with reports of frequency and time expenditure, information should be included about the presence and nature of assistance that the individual used (i.e., human, AD, and assistive devices). In the course of the study, medication use, physician visits, and health functioning should also be monitored for change. However, because individuals who obtain ADs often have progressive illnesses as well as co-morbid health problems, there

is likely to be much variability across participants on outcomes related to health functioning. It may be unlikely that one will observe any direct evidence of improvement in health functioning unless the sample sizes are quite large.

It would be of interest to examine individual differences in outcomes among the individuals who have obtained ADs. This could include psychosocial variables, health variables, adherence to the AD training program requirements, and aspects of the human–animal bond, which could be examined as predictors of differential outcomes. Future studies could also examine how specific training of the dog may affect the long-term success of the AD team.

The availability of well-trained ADs is low, and the demand for such dogs is high. Moreover, the training of ADs is expensive. However, it is possible that the use of ADs among individuals with disabilities may actually save money. Individuals partnered with an AD may be more likely than nonusers to live and work independently. They may have less need for hired caretakers, have better psychological and health functioning resulting in lowered health-care costs, and require less assistance from social agencies. Careful documentation of these effects may open the way for third-party reimbursement for ADs. Identification of any areas of functioning that receive less than satisfactory benefits can point the way for improvements in training, placement, and follow-up procedures used by AD agencies. Accountability should be promoted, as well as recognition of the real and potential benefits of well-trained ADs.

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