A Century of Therapeutic Use of the Physical Environment

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In this article, we describe the use of the objects and spaces of the physical environment by occupational therapy practitioners in the United States over the profession’s first 100 years. Using professional literature selected by decade from the years 1917 through 2016 to obtain data, we applied grounded theory methods to complete a detailed description. Team-based analysis over four coding schemes yielded a theoretical description of the profession’s therapeutic use of the physical environment. Study findings included descriptions across occupational therapy's history of (1) treatment spaces, (2) the concepts of adapting and grading, and (3) a typology of constructive and nonconstructive applications of objects and activities by occupational therapy clients and practitioners. This extended historical perspective on trajectories of change in intervention space, the role of physical products in intervention, therapist repertoire, and the enduring role of adaptation suggests how the physical environment may be used in future practice.


This analysis of occupational therapy practitioners’ therapeutic use of the objects and spaces of the physical environment offers a fresh, panoramic perspective on the profession. The origins of occupational therapy have most often been chronicled with an emphasis on the history of health care or the professional meanings ascribed to occupational engagement (Metaxas, 2000). Our Physical Environments Study complements previous histories by offering unique insights into the origins of present-day practice.

Material Culture History of Occupational Therapy

In the Physical Environments Study, we used a material culture approach to produce an original perspective on historical changes in the materials, objects, and settings of practice. In paleoanthropology, researchers use an analogous material culture approach in their analysis of artifacts across the fossil record (Chapple & Coon, 1942). Humans pass on positive adaptations in large part through material culture. The creation and skilled use of objects and built spaces are survival requirements, expressions of personal or tribal identity, and a way of making valued contributions to social groups. “Daily human life and skills are integrally involved with material objects and constructed spaces, including tools, toys, clothing, vehicles, art, food, crops, buildings, roads,
machines, books, medicines, manufactured materials, and technology” (Pierce, Munier, & Myers, 2009, p. 274).

Reed (1986) discussed the use or disuse of objects in practice, such as sanding blocks, and raised the question of whether these objects were the profession’s heritage or its extra baggage. Occupational therapy authors have also addressed the use of purposeful activities (Breines, 1995; Cynkin, 1979). In occupational science, the use of objects within human occupation has been of interest (Hocking, 2009). Considering the degree to which the objects and spaces of human occupation are used in intervention, however, there is surprisingly little written on this topic.

Method

The purpose of this study was to describe therapeutic use of the objects and spaces of the physical environment by occupational therapy practitioners in the United States from 1917 to 2016. A detailed theoretical description, deeply grounded in the data, was produced (Bryant & Charmaz, 2007).

Data collection included articles and documents from the Wilma West Library and selected articles and chapters across historical periods of the profession from Archives of Occupational Therapy, Occupational Therapy and Rehabilitation, American Journal of Occupational Therapy, and the Willard and Spackman’s Occupational Therapy series (see Supplemental Appendix A, available online at http://otjournal.net; navigate to this article, and click on “Supplemental”). Publications with the greatest degree of focus on aspects of the physical environment in intervention were selected (Schwartz & Colman, 1988).

The total number of fully analyzed documents was 64 journal articles and 17 chapters from the Willard and Spackman’s Occupational Therapy series.

Data analysis began immediately after data collection started and proceeded through all study phases (see Figure 1). Data were hand coded, and historical patterns within codes were described in memos. All memos were critiqued through team discussion, testing against data, and disconfirming cases. Our team-based approach strengthened trustworthiness of findings by using multiple perspectives throughout the research process (Guest & MacQueen, 2008).

Four distinct coding schemes emerged successively, with 5, 10, 4, and 4 primary codes, respectively. Detailed summary memos were produced for all codes. Comparative analysis moved in a deliberate sequence from maximal differences between historical periods and populations to finer differences in the data. After theoretical saturation was

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Figure 1. Grounded theory process: Team analysis using four successive coding schemes.

Note. The term Round Robin describes a team-based analysis strategy in which research tasks were initiated by one team member, and results were then reviewed and revised by the other two team members in succession.
reached, memos synthesizing themes crossing through the
data demonstrated that original concepts—a hallmark of
thorough grounded theory analysis—had been discovered
(Bryant & Charmaz, 2007).

A Century of Occupational Therapy
Treatment Settings

Early 20th Century
In the 1910s and 1920s, descriptions of practice settings
focused on the tenor of the space and how the use of
colors, light, and decorations could influence clients (Slagle,
1914; Tracy, 1925). This was also a time period in which
occupational therapy practitioners slowly transitioned from
transient entry into client spaces to using dedicated treat-
ment space. Out of necessity, practitioners created a small,
mobile space of their own—the OT cart (Haas, 1928).
Spencer (1921) described moving from an open porch to
a new building, showing that occupational therapy was a
“valuable asset” (p. 60). Additional descriptions included a
shop for metal work (Kransee, 1929), an occupational
therapy department in a school for children with cerebral
palsy (Martin, 1939), and needs for more space (Lewis,
1924). From the 1910s to 1940s, practitioners also worked
in natural settings, such as tenements (Collins, 1922),
arfmlands and gardens of institutions (Slagle, 1914; Tracy,
1925), and cure porches of sanatoriums (Lewis, 1924).

Mid-20th Century
By the late 1940s, references to sanatoriums and patients
with tuberculosis decreased. Treatment of patients with
mental illness was described through the 1960s. Use of
inpatient hospital and physical rehabilitation settings
remained generally constant after World War I. In the
1960s, services were characterized by patients entering
outpatient clinics from the community (Bergmann, 1977).
In the 1960s and 1970s, there was advocacy for population
and community-based services (Finn, 1972; West, 1968).

Late 20th and Early 21st Centuries
Involvement in universal design and workplace modifications
strengthened in the late 20th century (Rigby, Trentham, &
Letts, 2014). Community-based services were not described
in a meaningful way until the 1980s, such as attending
school district meetings to establish school-based practice
(Griswold, 1994; Sieg, 1975) and working in independent
living centers (Frieden & Cole, 1985; Simon, 1988).
Expansion into the community continued in the 1990s
and 2000s, with increasing focus on home space and an
expanded view of communities (Rigby et al., 2014; Scaffa,
2014). Services were provided to increasingly diverse
populations in the home, workplaces, school systems,
and neighborhoods (Fänge & Iwarsson, 2005; Gage,
Cook, & Fryday-Field, 1997). Community-based prac-
tice included establishing and maintaining occupational
therapy as an integrated service for school systems and in
home health (Mallinson, Fischer, Rogers, Ehrlich-Jones,
& Chang, 2009; Sudsawad, Trombly, Henderson, &
Tickle-Degnen, 2002). In the literature, researchers also
described supporting independence for people with dis-
abilities outside of institutions and addressed a broader
agenda of increased community access (Fänge & Iwarsson,
2005; Rigby et al., 2014). Practitioners working in in-
patient settings began thinking in terms of postdischarge
needs (Scaffa, 2014; Walker & Howland, 1991). Most
recently, technology-supported interventions have offered
new ways to access clients in their homes and commu-
nities (i.e., telerehabilitation) or provided services that
supported community participation (i.e., driving as-
essment with simulators; Classen, Monahan, Auten, &
Yarney, 2014; Linder et al., 2015).

History of Adapting and Grading in
Therapeutic Use of the Physical Environment

Adapting: Early 20th Century
In the early years, crafts were chosen for their level of
adaptability (Haas, 1928). Adaptation implies a one-time,
static change to objects, raw materials, environments, or
activities, often in response to the needs of a specific client
or the constraints of institutional space. The first use of
adaptations was to create interventions in institutional
settings without a dedicated workspace; for instance,
Tompkins (1926) adapted steam tables and a china closet
in a hospital dining room to create usable space. Second,
adaptations customized activities and objects, such as
chairs or looms, for new client populations, including
people who were homebound or children with cerebral
palsy (Brokaw, 1948; Collins, 1922; Martin, 1939).

Grading: Early 20th Century
In the early years, grading was used to increase complexity
and duration of an activity. Grading uses fine-tuned,
sequential changes to customize an activity to a particular
person. Scott (1923) described psychiatric hospital classes
that progressed from unraveling burlap to making Persian
knot rugs. Other uses for grading in the historical liter-
ature included requiring attention for longer periods of
time by providing increasingly difficult string work
for a child and promoting work tolerance through
advancing from braid weaving to upright looms while working at a progressively faster pace (Lewis, 1924).

Adapting: Mid-20th Century

By the 1950s and 1960s, occupational therapy practitioners were refining their services for populations through adaptations to existing devices, such as surplus double-pedestal, over-bed tables (Simpson, 1965); garden layouts and tools (Goble, 1969); and expanded typewriter keyboards (Lascelle, 1956). In the 1970s, novel devices were developed specifically for the needs of given populations, such as the Auto-Communication Slider for children who were nonverbal (Bullock, Dalrymple, & Danca, 1975) and a visual-tracking machine for visual–perceptual training (Bergmann, 1977). Adaptability of objects and materials was of primary importance, whereas certain crafts, such as knitting, were of “doubtful value” because of their perceived inadaptability (Spackman, 1971, p. 173).

Grading: Mid-20th Century

In the 1930s through 1950s, grading was used in increasingly varied ways, often as preparatory activities, such as lacing on a form before lacing shoes (Martin, 1939) or strengthening before return to work. Smith, Barrows, and Whitney (1959) introduced a “classification of activities into a graded series according to appeal, energy requirements, or other characteristics” (p. 16)—the earliest recognizable activity analysis system in the data. By the 1970s, there was a surge of information on grading, usually focused on increasing specific physiological capacities of clients; however, the means for doing so were still supplied by handicrafts (Spackman, 1971).

Adapting: Late 20th and Early 21st Centuries

Beginning in the 1980s, adaptations were made to increase clients’ functional independence. For instance, modifications to home contexts included widening doorways and installing ramps (Rigby et al., 2014). Both everyday objects and therapist-constructed assistive devices were altered, such as built-up handles, elastic laces, and adaptive scissors (Cumming et al., 2001; Gillen, 2014; Malick & Almasy, 1983). Adaptive equipment, such as therapy balls and weighted vests, were used in classrooms (Bagatell, Mirigliani, Patterson, Reyes, & Test, 2010), whereas unique assistive technologies increased independence in the community (Camp, 2001).

In the early 21st century, client education emerged as a significant adaptive approach (Berger, 2014). For example, clients were taught compensatory strategies, such as energy conservation or one-handed techniques (Gillen, 2014). Adaptations were made to the social environment, such as identifying supports and barriers to job seeking (Liu, Hollis, Warren, & Williamson, 2007). Achieving a person–environment fit through modifications was perceived to increase clients’ adaptive responses and to enhance their well-being (Dooley & Hinojosa, 2004; Kohler, 1980; Walker & Howland, 1991).

Grading: Late 20th and Early 21st Centuries

By the late 20th century, less was written about grading. Although still component based, grading was used in naturalistic settings, such as in a garage, where bike repair and oil changes could be completed in various positions and with differing levels of support (Simon, 1988). In the grading literature, researchers discussed adding portions of a task over time; going from a more sequestered experience to a natural setting; increasing demand or decreasing support in activities, such as number of breaks or amount of assistance; and monitoring progression in an activity. By the early 21st century, robot-assisted devices mirrored the novel devices of earlier decades but with a more advanced technological capacity to provide graded activities without a therapist’s presence (Huang et al., 2014; Linder et al., 2015).

History of Occupational Therapy’s Therapeutic Use of Objects, Materials, and Activities

This study revealed a four-square typology of constructive or nonconstructive activities, completed by either clients or practitioners. Each category displays historical trends.

Client Construction

Arts and crafts, heavily used in the founding years, are client construction activities: They result in a physical product. Initially, client construction activities were small, inexpensive, and portable, or they were created in the shops, barns, laundries, and gardens of institutions. Yarn and thread were the most common materials; objects included hand tools, kitchen implements, and large equipment. The literature was filled with step-by-step craft directions, and clients often sold their products (Scott, 1923). In the 1940s, publications detailed craft tool inventories to furnish newly created clinics. By the 1970s, occupational therapists were routinely using large equipment in their clinics, such as adapted looms (Spackman, 1971). Wood, metal, clay, and leather work were added in the 1940s through the 1990s. There was a resurgence in client construction, especially ceramics, in the 1960s and 1970s. By the 1980s, the aim shifted to aspects of life after discharge that focused on a physical product, such as factory
assembly work or household and vehicle maintenance (Malick & Almasy, 1983). A new emphasis on women’s roles triggered the addition of kitchens to clinics during the 1980s. Since 2000, there has been little mention of client construction (Scaffa, 2014).

**Client Nonconstruction**

Client nonconstruction activities are those work, leisure, and self-care activities that do not result in a physical product. Objects used in client nonconstruction activities included clothing, technology, and equipment for play, leisure, and learning. In the 1910s and 1920s, client nonconstruction was limited, but it did occur in games and leisure activities; self-care; and work within institutional shops, kitchens, laundries, and gardens (Scott, 1923). In the 1930s to 1950s, no mention was found of nonconstructive leisure activities in the sampled literature. The 1960s saw a slight increase in client nonconstruction, with play and leisure used again, and learning activities added to intervention repertoires. Individualization of interventions in client nonconstruction activities increased through the 1990s, emphasizing self-care, leisure, education, and vehicle and home maintenance occurring in, and focused on, usual client settings beyond the clinic. Literature from the 2000s infrequently referred to specific client nonconstruction activities, except as examples of client education, revising client routines, or working with a client’s daily activities during therapy (Gillen, 2014).

**Therapist Construction**

In the therapist construction category, practitioners are engaged in construction activities on behalf of clients and in which clients have little active involvement. Therapist construction activities have been of two types: (1) practitioners building, adapting, or providing therapeutic tools, equipment, and healing devices, and (2) practitioners acting to shape the form and capacities of specific anatomical parts of a client.

With the notable early exception of a cart for transporting supplies within institutional spaces, therapist construction was first evident in plans for an adapted table and chair for children with cerebral palsy (Martin, 1939). As occupational therapy practitioners created new clinics in the 1940s, they adapted equipment for clinical use and began the regular custom manufacture of objects for physical healing and improved function, such as splints and orthotic devices (Brokaw, 1948; Gleave, 1971). In the 1940s to 1980s, practitioners described clients’ anatomical parts as objects to be reshaped or restored by the therapist (Anderson & Anderson, 1988; Hollis, 1983). Therapist actions to directly create physical healing continue strongly in use today within some specialty areas.

By the 1960s, literature describing therapist construction was greater than that describing client construction. The sensory integration approach emerged in the 1980s, for which practitioners designed specialized equipment that was actively manipulated to produce a therapeutic effect (Ottenbacher, 1978). Construction of healing devices shifted in the 1980s to prescription, provision, and fitting of premanufactured devices (Chase, 1989; Culler, 2003). Providing devices for in-home use began to be of interest in the 1990s and is common today in home modifications to support accessibility and safety for older adults aging in place and to support classroom inclusion of students with disabilities (Cumming et al., 2001). As technology has evolved, therapist provision of assistive devices has become highly complex, extending to robotics, smart devices, and even animal assistance (Camp, 2001; Huang et al., 2014).

**Therapist Nonconstruction**

A unique category emerged in the recent literature: In therapist nonconstruction, practitioners complete activities that do not produce a product and do not directly engage clients. Objects in this category include—in general historical order of emergence—clinic furnishings; administrative documents, client records, and assessments; research equipment; and informational materials for patient education, advocacy, and consulting (Hsieh, Nelson, Smith, & Peterson, 1996).

In the 1940s, practitioners showed great interest in the creation of occupational therapy clinics. The creation of new programs entered the literature in the 1940s as work programs and continued through the emergence of sensory integration treatment spaces. By the 1980s, hospital clinics began to more closely resemble everyday life spaces.

Occupational therapy assessments emerged regularly in the 1960s literature and continue as a strong presence in present patterns of publication (Jacobs, 1993). The importance of patient advocacy emerged in the 1980s, and consulting’s significance emerged in the 1990s. Educational approaches began to be mentioned in the 1980s and continue in the present. Administrative and record-keeping activities held some prominence in the 1980s. By the 2000s, research was the therapist nonconstruction activity most frequently mentioned.

Today, therapist nonconstruction activities are extensively included in the literature, primarily describing patient education in clients’ natural settings and the development of assessments of client function in usual...
settings—including at home, at work, in the community—and while operating vehicles (Classen et al., 2014; Seamon, 2014; Shotwell, 2014).

The Unfolding of Occupational Therapy’s Spatial Vision of Intervention

**Extreme Adaptability of Occupational Therapy as a Profession**

Although it was not the purpose of this study to analyze the effects of prevailing sociopolitical contexts on intervention, it is arguable that the history of U.S. culture and health care shaped occupational therapy practitioners’ use of the physical environment over the past century. Occupational therapy’s central passion for occupation emerged from the values of the Arts and Crafts Movement: Traditional skills and craftsmanship were viewed as countering the dehumanizing effects of industrializing forces (Quiroga, 1995). The profession has also demonstrated great adaptability to the influences and opportunities presented by successive cultural shifts: World Wars I and II, the development of scientific methods and rehabilitation, the women’s and disability rights movements, and the emergence of new technologies and an information economy (Schwartz, 2003). The addition of kitchens to occupational therapy clinics in response to a new cultural awareness of the unpaid work of homemakers provides a good example of how the field repeatedly transformed to match cultural change.

Occupational therapy has also repeatedly transformed practice in response to health care policy and legislation—most notably, the Rehabilitation Movement, Medicare and Medicaid, the Americans With Disabilities Act of 1990 (Pub. L. 101–336), and the Patient Protection and Affordable Care Act of 2010 (Pub. L. 111–148; Schwartz, 2003; Starr, 1982). The Education for All Handicapped Children Act of 1975 (Pub. L. 94–142) extended the role of occupational therapy practitioners into school-based settings—including at home, at work, in the community, and while operating vehicles (Classen et al., 2014; Seamon, 2014; Shotwell, 2014). The reconceptualization of intervention space to the expansion of current practice into the natural contexts of clients’ homes, schools, workplaces, and wider communities. In the 1940s, the profession established hospital-based clinics serving inpatients and, later, outpatients: carefully designed spaces within which the finely graded and measurable interventions of the biomedical approach were developed. In the later 20th century, theoretical development pushed in-clinic interventions to target function in the spaces to which clients would be discharged. The reconceptualization of intervention space as the client’s life space was greatly advanced by the movement of occupational therapy practitioners into school-based practice and home health. In the present day, clinical space has so dramatically extended into natural client spaces that home, school, and workplace assessments and modifications—as well as adaptations of client daily routines and social environments—are not uncommon.

**Historical Trajectory 2: The Enduring Value of Adapting and Grading**

A key concept discovered in this analysis was occupational therapy practitioners’ enduring use of the processes of adapting and grading. Practitioners’ thinking about this process has become increasingly sophisticated as the profession has matured. In the early years, adaptations were practicalities, made to meet the needs of a given population. Over time, adaptations took on a much broader conceptualization in responding to individual clients in their natural settings, including the use of an educational approach. The development of grading followed a similar trajectory: first focusing on limited and imprecise goals, and later being used in increasingly varied and well-defined ways. Refinement of the principles of grading using a biomechanical perspective during the 20th century laid the groundwork for today’s highly individualized, client-centered practice. The ability to design, create, modify, and problem solve for a client under any given circumstance has become an essential quality of occupational therapy practice.

**Historical Trajectory 3: Physical Products**

Occupational therapy began in a period that respected craftsmanship: Employment in crafts and manufacturing was not uncommon. Arts and crafts activities dominated early practice. Client construction activities resulting in physical products were used to address biomechanical goals through the mid-20th century, relying heavily on highly adaptable textile work. In the 1960s and 1970s,
products of metal, wood, leather, and clay were common. In the 1980s, the production of food by homemakers attracted interest—but mainly as a way of preparing to do the same postdischarge, and with limited interest in the craftsmanship or product of a cooking activity. Since that time, client construction of objects during intervention has waned considerably.

In contrast, occupational therapy practitioners’ construction of physical products has grown steadily over the profession’s history. Early adaptations of equipment to furnish clinics spurred the thinking behind fine adaptations of activities to reach biomechanical goals and launched therapist construction of devices for daily living and healing. A new form of practice emerged in which practitioners worked directly to produce change in a specific anatomical part—an approach that continues in the present (Sharp, 2000). Later in the 20th century, production of healing devices changed from therapist construction to therapist prescription and fitting of premanufactured devices. An extensive set of clinical equipment for different settings also entered commercial production. Today, therapist prescription of manufactured assistive technology for client use in home, school, work, and community settings ranges from low-tech objects to highly complex systems.

**Historical Trajectory 4: Expansion of Therapist Repertoire**

Although often viewed through the rose-colored glasses of nostalgia, the start of the profession can be generally characterized as the broad application of arts and crafts by intelligent and inspired volunteers. In this historical review, the degree to which the skilled repertoire of an occupational therapy practitioner has expanded over a century is striking. Interventions have become increasingly tailored to the specific needs of individual clients and now shape function within the real-life spaces of clients. Areas of practice rooted in the provision of adaptive equipment, healing devices, and assistive technology have grown strong. In addition to direct intervention, the skills of assessment, administration, client education, consulting, and research have been added to the expected abilities of practitioners. Today’s professional literature is dominated by these recent expansions in the occupational therapy practitioners’ repertoire.

**Limitations**

To develop a trustworthy and detailed theoretical description, in this study we used multiple corroborating sources, a data-driven team analysis, and a carefully constructed analytic path. It is possible, however, that the sampled professional literature may not accurately represent occupational therapy practice or that we may have omitted important evidence contributing to a more complete view of the use of the physical environment by occupational therapy practitioners.

**Implications for Occupational Therapy Practice**

Our Physical Environments Study depicts historical transformations in intervention space, adapting and grading, the role of physical products in interventions, and the expansion of practitioner repertoire. The following implications suggest how these trajectories of historical change in therapeutic use of the physical environment may unfold into future practice:

- As occupational therapy becomes further integrated into clients’ natural settings, practitioners will have increased opportunities to center therapeutic efforts on relatively intact occupations within the spaces of the client’s daily life. For example, the use of telerehabilitation, supported by videoconferencing and self-monitoring devices, can help older adults age in place and remain engaged in everyday occupations within their homes (Cason, 2012). In addition, technology, such as therapy ball chairs, supports students’ engagement in the classroom setting (Bagatell et al., 2010).

- Therapeutic use of adapting and grading has evolved far beyond the simple adjustments in craft activities of the profession’s early years. The dedicated professional spaces of the biomechanical period provided controlled settings within which highly adaptable, measurable, and product-focused interventions addressing physical limitations were conceptually refined. Today, grading and adapting are used within a multifaceted, dynamic, and highly contextualized approach that draws on a client’s potential to foster engagement within everyday spaces. Current interventions with children with autism spectrum disorders exemplify this approach because grading of task and environment within the natural context increases generalization of functional behaviors and occupational participation (Tomchek & Koenig, 2016).

- Although practitioners’ construction of objects to support client healing or function has shifted to the use of manufactured items, the clinical reasoning necessary to effectively prescribe these devices and to train clients in their use has not changed. Moreover, this aspect of practice will continue as adaptations within clients’ natural environments, particularly in postacute settings, become increasingly important.
The increasing sophistication of practitioners’ repertoires suggests the benefit of higher levels of education for both occupational therapists (i.e., clinical doctorate) and occupational therapy assistants (i.e., baccalaureate entry) so that they may cultivate the knowledge, skills, and clinical reasoning to effectively use all aspects of the physical environment on behalf of their future clients. Programs that provide higher levels of education may have more opportunities for service learning, fieldwork experiences, or capstone projects that address the complexity of clients’ needs in their homes, schools, neighborhoods, and communities through a focus on the therapeutic use or adaptation of the objects and spaces of those environments.

The Spatial Gift

Findings of our Physical Environments Study demonstrate that the profession of occupational therapy has, over its history, developed a remarkable gift for creating, modifying, and applying for therapeutic effect the objects and spaces of the physical environment. Vigilance for opportunities to exploit the physical environment to address client needs is a hallmark of occupational therapy. This lasting stance springs from the field’s history of continually seeking to advance into new spaces to serve new populations, thus causing the rapid theoretical growth necessary to respond to the unique client goals and therapeutic potentials of the physical environment in each new type of treatment setting. The profession’s enduring desire to fully use the potential of physical settings, objects, and activities for the benefit of clients has evolved into a capacity for creating and using assistive devices and equipment, adapting and working within natural client spaces, and intuitively comprehending how spatial context can be used to realize valued client outcomes.

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References

Education for All Handicapped Children Act of 1975, Pub. L. 94–142, renamed the Individuals With Disabilities...


