A Guideline for Introducing Powered Mobility to Infants and Toddlers

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This work was conducted with funding support from Permobil

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Dr. Feldner earned her Bachelor's degree in Human Biology and Master's degree in Physical Therapy from Marquette University in Milwaukee, WI. She practiced full-time as a pediatric physical therapist for over 13 years, including roles in seating and mobility clinics and across school, outpatient rehab, inpatient acute, and intensive care settings. She began teaching in the DPT program at the University of Illinois at Chicago in 2010, and began her PhD training in 2012, the same year she earned her Specialty Board Certification in Pediatrics. She earned an Assistive Technology Certificate in 2015 and her PhD in Disability Studies in 2016, also from UIC. Dr. Feldner joined the Mechanical Engineering Department at the University of Washington for a postdoctoral research fellowship from 2016-2018 and joined the Department of Rehabilitation Medicine as faculty in 2018.

Dr. Feldner's research centers on the design and implementation of mobility technology and its effects upon activity and participation within a variety of personal and environmental contexts, including how perceptions of disability and identity emerge and evolve through technology use. She is especially interested in conceptualizations of accessibility, ableism, and allyship, considering how technology design and provision, social attitudes, and the built environment affect access, equity, and participation. Her recent work examines how disability can be further integrated into intersectional Diversity, Equity, and Inclusion initiatives. Dr. Feldner has also been a part of the International Go Baby Go mobility and socialization movement since 2012, conducting research and outreach with DIY adapted mobility devices.

Dr. Feldner has presented her work nationally and internationally at conferences such as the APTA, RESNA Annual Conference, Society for Disability Studies, International and European Seating Symposia, and the Academy of Pediatric Physical Therapy Annual Conference. She has been an invited keynote and plenary speaker as well as a peer-reviewed presenter. Heather has received research funding from institutions such as the NIH, NIDILRR, American Academy of Cerebral Palsy and Developmental Medicine, University of Washington, and Microsoft.

Teresa Plummer

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Teresa Plummer (PhD, OTR/L, CAPS, CEAS, ATP) is an Associate Professor in the School of Occupational Therapy at Belmont University in Nashville, TN. Her professional experiences include adult rehabilitation, assistive technology and seating & positioning. Dr Plummer has over 40 years of occupational therapy experience.

She has conducted workshops nationally and internationally in the areas of rehabilitation and assistive technology and pediatric powered mobility. She has been an invited guest speaker in Ireland, Switzerland, Singapore, and Argentina as well as many organizations in the United States. She holds Assistive Technology Professional credentials from Rehabilitation Engineering & Assistive Technology Society of North America (RESNA) and actively continues clinical practice in this area. She is also a Certified Ergonomic Assessment Specialist and a Certified Aging in Place Specialist. She is a member of RESNA, the American Occupational Therapy Association and the American Home Builder Association.

Dr. Plummer graduated with her Associate of Science Degree in Occupational Therapy from Mount Aloysius College, a Bachelor of Science from the Medical College of Virginia in 1984 and her Master's of Science from Belmont University in 2005. She graduated from Nova Southeastern University with her PhD in Occupational Therapy in 2010.

Dr. Plummer is reviewer for the American Journal of Occupational Therapy and guest reviewer for several other journals related to wheelchair service provision. Dr Plummer, along with two other researchers conducted the Human Factors Validation Study for the Explorer Mini.

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She has co-authored the RESNA position paper on Pediatric Power Mobility (2009, 2018). Teresa is the author of numerous chapters in textbooks for occupational therapy. Her doctoral dissertation topic was published 2012 in the Internet Journal of Allied Health Sciences and Practice and is entitled "Participatory Action Research to Determine the Essential Elements of a Wheelchair Assessment". Dr. Plummer provides OT services pro bono at Siloam. A non-profit clinic in Nashville Tn. She is currently active in research projects with the International Society of Wheelchair Professionals and in Pediatric Powered Mobility topics.

Alyson Hendry

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Alyson Hendry, M.A.,CCC-SLP is a bilingual (English/Spanish) pediatric Speech-Language Pathologist, residing in Denver, CO. Her professional speech-language therapy experiences include pediatric outpatient and home health settings, public schools, early intervention, telehealth speech therapy, and private practice. She is the owner of Speech and Movement LLC, and she currently provides speech and language therapy in Cherry Creek Public Schools. Her clinical passions include caregiver training, working with culturally and linguistically diverse (CLD) clients, early intervention, speech sound disorders, and finding ways to engage clients in stimulating, brain-based speech therapy. Additionally, she provides health coaching to support SLPs and other allied health professionals navigate the ongoing work-life balance challenges that many face in today's climate. She finds great meaning in supporting caregivers and professionals to understand and advocate for their children's needs, as well as their own.

Alyson is from Missouri and graduated in 2009 from Truman State University, in Kirksville, MO with a Masters in Communication Disorders and a minor degree in Spanish. She has since lived and worked around the country, gaining experience in a variety of settings with many types of clients. Her most rewarding professional experience came from a trip to El Salvador with Austin Smiles, where she participated as part of a cleft lip and palate medical team, providing therapeutic care pre- and post-operatively.

Alyson has presented at the state level at both the Missouri Speech Language Hearing Association and Texas Speech Language Hearing Association conferences on topics involving assessments and interventions for English Language Learners, Collaborating with Teachers, and Literacy-Based Intervention. She is the author and creator of the on-line course Tools for Telepractice, a creative and innovative program to support clinicians new to the setting of telehealth. She provides in-services and presentations to public schools, universities, and private practices on topics related to working with CLD clients, telepractice, as well as burnout treatment and prevention for clinicians. She has also helped publish multiple, evidence-based guidebooks for clinicians to enhance their evaluations and therapeutic interventions.

As a SLP having worked on numerous interdisciplinary teams, and with her experience as an integrative health coach, Alyson is enthusiastic about integrating mobility and movement into her clinical practice, and places high value on helping children succeed in all areas. She believes that providing On-Time mobility is crucial to helping children not only meet milestones, but improve the quality of their lives and their sense of agency and self.

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Background and Purpose

Self-initiated mobility is essential for all children, regardless of mode. Powered mobility is just one of many opportunities to support the onset and refinement of self-initiated mobility in infants and toddlers with disabilities or developmental delays. It provides an especially powerful experience to nurture curiosity, tool-use understanding, and develop meaning-making through movement.[1] The purpose of this guideline is to provide a systematic, evidence-based, interdisciplinary, collaborative partnership approach to initial introduction of powered mobility devices for infants and toddlers.[2–5]

The Explorer Mini is a new, lightweight powered mobility device. This device was designed specifically for children between the ages of 12 and 36 months (with a maximum height of 39" and maximum weight of 35 lbs/15.9kg). The Explorer Mini is lightweight (52 lbs/23.6kg including battery) and fits in most automobiles (length: 25 inches; width: 19 inches; adjustable height: 29-37 inches). The Explorer Mini runs on a 12-volt battery with a driving range of 3.5 miles/4.8km and a maximum speed of 1.5 mph/2.4km/hr, is controlled via a joystick with a 360-degree turning radius, has proportional speed control with 5 speed options, and can be used in a seated or standing position. The purpose of this device is to promote self-initiated mobility and environmental exploration among children with mobility impairments (Permobil.com).

This guideline is geared toward the Explorer Mini, as it is the first joystick-operated powered mobility device of its kind, regulatory cleared by the US FDA in March 2020 and CE-marked, to be designed specifically for infants and toddlers. It is important to note that the majority of the research evidence and clinical practice suggestions included in this guideline have been developed based on a broad range of ages, populations and abilities, and devices prior to the

release of the Explorer Mini. However, the evidence-based principles and suggestions presented in this guideline have been specifically curated for their relevance for powered mobility learning using the Explorer Mini. These research and clinical practice resources may also be useful for other devices or access modes, as well as future powered mobility devices that support On Time mobility for children with disabilities. On Time mobility is a newly proposed framework that highlights principles of timing, urgency, frequency, sociability, and multi-modal mobility to facilitate the right to active mobility to explore, engage in relationships and develop agency to co-create their lives (Sabet et al., In Press).

Development of the Guideline

This guideline was developed using a thorough literature review and evidence appraisal, synthesis of existing tools pioneered by researchers and clinicians in seating and mobility, followed by a Delphi consensus study with stakeholder expertise from caregivers, physical therapists, occupational therapists, and speech language pathologists who work with children with disabilities across the world to establish best-practice priorities for introducing powered mobility to infants and toddlers. Delphi studies have been previously used within the field of early mobility and beyond as a valuable tool to establish consensus, set research and intervention priorities, and evaluate evidence.[6–8] It is important to note that while the most current evidence is included in this guideline, evidence appraisal continues to indicate generally low-quality levels of evidence (IV and V) in the field of pediatric powered mobility, outside of a few randomized-controlled trials and other clinical trial.[7,9] Researchers in the field continue to develop novel approaches to overcome the challenges of producing high quality evidence related to powered mobility and produce more rapid translation of research into practice.[10] However, more research is needed to promote access to devices and services that address the unmet mobility needs of very young children with disabilities.

Establishing a guideline for the introduction of powered mobility devices to infants and toddlers is important because:

- Access to powered mobility is part of multi-modal mobility intervention during rehabilitation for infants and toddlers with disabilities and needs a roadmap for introduction that is readily available and easy to follow.
- It helps ensure that best practice and evidence is used to support collaborative decision-making.
- It provides a framework based on current research evidence as well as clinical and caregiver expertise so outcomes across settings and may be documented and compared more effectively.
- Reproducible, repetitive, and reliable training cues helps facilitate learning for all children.
- Input from many stakeholders promotes a holistic and thorough approach to prioritizing content.
- It addresses the misconception that manual devices should be initiated first to encourage physical activity or to prevent ‘dependence’ on a powered device. [11]

- It may be used in conjunction with reliable and valid pediatric powered mobility outcome measures to facilitate assessment and training.[12]
- Further research work and grant funding supporting access to On Time mobility experiences for young children with disabilities hinges on the ability to demonstrate impact, significance, and a systematic approach and methods.

The information presented subsequently represents the full scope of the guideline project. Specifically tailored versions of this guideline for both clinicians and families are also available.

A Collaborative Partnership Approach

Successful introduction of powered mobility to children and caregivers is dependent first and foremost on building strong, collaborative partnerships. Establishing trust and tailoring the introduction process around the needs and preferences of the child, family, and other carers/ caregivers is an essential first step to maximize success in all subsequent aspects of powered mobility introduction. Throughout the rest of this guideline the term 'caregivers' is used to broadly refer to anyone in a child's life or culture that is engaged in providing care of any sort, including but not limited to parents, grandparents or other extended family, educators, personal care attendants, childcare providers, group home or program staff, etc.

Caregivers should be recognized as central team members in shared-decision making about timing and strategies for introduction of powered mobility as well as setting realistic expectations about learning.[13] It is important to understand the child's and caregiver's preferences and motivations that may spark interest and engagement. This includes understanding short and long-term mobility and participation goals, current perceptions of powered mobility, and acknowledgement that these may change over time.[14,15] As Nilsson & Durkin[16, p.65] note, "The goals of mobility practice need to be adjusted to where the learner is within the learning process, their interests and how they want to proceed as part of setting achievable goals". This also entails recognizing and celebrating each small step forward as a success in the learning process, especially for early learners. Caregivers are also the primary resource for understanding background and culture, environments and relationships, and other contextual factors that make up a child's lived experience.[13,17,18]

Both evidence and stakeholder consensus indicates that device design and operation are also critical aspects of a collaborative partnership approach, in that devices must be simple and easy to use for both children and caregivers.[19] Collectively, these collaborative

principles, which are especially critical for this young age group to promote learning and self-exploration, have also been recommended in previous powered mobility studies.[16,18,20- 21]

Other Considerations for Researchers, Clinicians, and Caregivers

As a researcher or clinician, it is important to provide various training resources to caregivers (i.e. written resources, checklists, video demonstrations and feedback) to ensure they have the necessary knowledge and skills to support the child's continued success while using the powered mobility device. It is important to gauge the confidence of caregivers in setting up the device appropriately for the child as well as facilitating the child's use of the device, according to learning needs. Individualized support for improving caregiver's confidence should be provided based on the caregiver's needs.[22] Another important consideration is teaching caregivers when or when not to intervene or use various cues (verbal/auditory/visual, etc). This may involve sharing strategies that have worked well for other caregivers in the past or identifying new strategies together. Finally, it is important to determine standard instructional cues for clarity, consistency, and confidence among the collaborative team to maximize learning.

Confidence has been shown to directly connect to the type, frequency, and method of information exchange between stakeholders.[22–24] This not only enhances problem-solving teamwork, but also creates additional comfort with exposure to new assistive technology devices and incorporating these devices into everyday routines.[22–24,25,26] Team-based learning and problem-solving strategies developed in collaboration have been shown to be have a higher likelihood of use and implementation throughout a typical day by caregivers and children.[27]

The Process of Learning Powered Mobility

Learning powered mobility at any age involves a fluid process of interactions between the child, caregivers, clinicians, the device itself, the environment, and desired goals or activities facilitated by movement depending on learner stage. There is no expectation of pre-existing abilities, rather, abilities emerge through interaction, trial and error, and guidance.

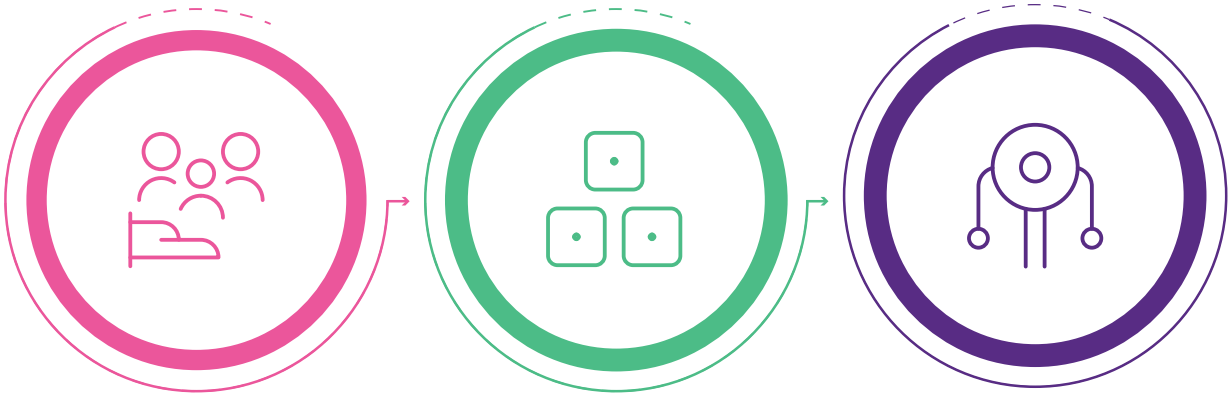
Recommendations around the emergence of powered mobility skills or prerequisite abilities to determine "readiness" have shifted over time. For example, when powered mobility was first introduced for young children, seminal work was conducted to demonstrate that children were safe and capable learners, and certain prerequisite abilities were identified.[28,29,30] However, now that powered mobility device use has been demonstrated in children as young as 7 months old,[31] recent research and expert opinion has indicated that clinicians should move away from focusing on "readiness" for powered mobility.[32] Instead, literature in the field now recommends that clinicians should provide early opportunities for augmenting mobility with technology to facilitate development across multiple domains, which may subsequently promote the emergence of new abilities.[33–35]

Use of powered mobility has been shown to impact development in a variety of areas including cognitive, visual, language, social, and psychological abilities.[36–38] Because of the developmental importance of mobility and the reciprocal learning that occurs during mobility and interaction with people and the environment, researchers have recommended that powered mobility be considered as part of a comprehensive early intervention program. Goals may include maximizing these developmental connections and minimizing or preventing the impacts of immobility, including further delays in milestones or social engagement, and learned helplessness.[39,40]

Across the decades, colleagues in the field of seating and mobility have developed, adapted, and described novel resources for understanding learning stage, ability acquisition, and training for powered mobility in children.[21,41–46] Two resources that are particularly relevant for infants and toddlers being introduced to powered mobility for the first time include Field and Livingstone's[47] learner profiles and Nilsson and Durkin's[16] Assessment of Learning Powered Mobility Use and Facilitating Strategies.

Field and Livingstone have described three different groups of powered mobility learners based on current abilities, support recommended, learning environments, and example practice strategies.[47] These categories include Exploratory Learners, Operational Learners,

and Functional Learners.[47] What differentiates learner groups depends on the progression of learning through different stages of skill development based on a variety of factors. For Exploratory Learners, the focus is on engaging in motivating activities focused on exploration rather than goal-directed driving, within a familiar environment and with constant supervision. For Operational Learners, the focus is learning to operate the device and initiate goal-directed driving. Functional Learners quickly develop goal-directed driving and use the powered mobility devices to engage in everyday routines, structured around participation.



Exploratory Learners	Operational Learners	Functional Learners
• Require constant, close adult supervision when using power mobility devices such as the Explorer Mini	• Require close adult supervision and occasional assistance	• Supervision as indicated by age and developmental level, often at a distance
• Training should occur within a familiar and safe environment	• Training may occur in one or two environments	• Focus on navigating a range of more challenging and complex environments
• Engage in motivating activities for exploration, rather than goal-directed mobility	• Engage in specific play activities to promote skill development and success in power mobility devices	• Engage in goal-directed driving, refinement of driving skills
• Independence not expected	• Varied expectations for independence and safety awareness	• Increasing independence in complex environments or situations

Figure 1. Field and Livingstone's[47] (Exploratory, Operational, and Functional Learner Groups)

Nilsson and Durkin's [16,48] Assessment of Learning Powered Mobility Use v. 2.0 (ALP) combines eight learner phases (Novice to Expert) nested within three learning stages (Explore Functions, Explore Sequencing, Explore Performance), providing descriptors of example behaviors for attention, activity and movement, understanding of tool use, expressions and emotions, and interaction/communication. The assessment tool is paired with a series of facilitating strategies for each phase and stage to encourage learning, enhance facilitator and child communication and responses, and engage in informed decision-making about driving environments. The ALP is summarized in the figure below, but the complete tool and facilitating strategy document is available at www.lisbethnilsson.se. Fluctuation between phases is common during learning and is based on a child's alertness or fatigue, attention, and motivation.[16,49] Phase and stage descriptor detail ensures that small changes in learning are recognized and celebrated, helping to maintain child and caregiver motivation.[16,48]

Stages

Exploring Function, focus on body and device

Phases of Attention, Activity, Understanding of Tool Use, Expressions/Emotions, and Interaction/Communication

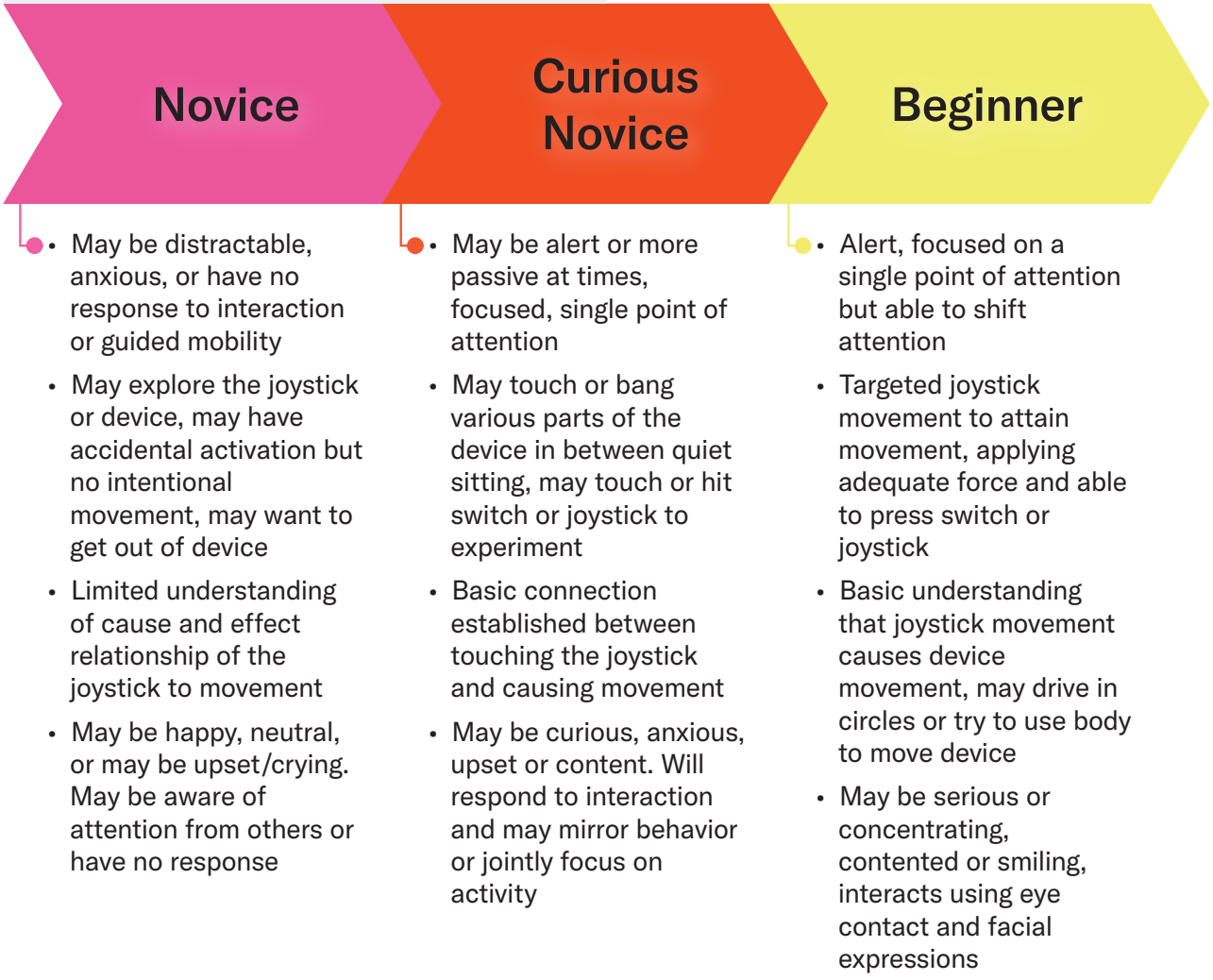


Figure 2. Nilsson & Durkin's Assessment of Learning Powered Mobility Use Phases and Stages[16,48]

Stages

Exploring Sequence, focus on body, device, and environment

Phases of Attention, Activity, Understanding of Tool Use, Expressions/Emotions, and Interaction/Communication

Advanced Beginner

- Attentive but can shift attentionspontaneously
- Intentional exploration of joystick and its functions for movement, movements may be cautious or careful
- Aware of movement in different directions, exploring cause and effect of joystick activation or multiple switches in different ways
- Shows desire to explore environment, may smile and laugh or be serious, engages peer or adult in exploration

Sophisticated Beginner

- Attention focused on two different points, focused and active
- Exploring and experiementing with device and directional movements, may be more eager or a ressive with joystick
- Understands different effects of joystick moving in different directions, understands add-on guidance systems if applied
- May show frustration or eagerness and smiling given developing abilities. May show reciprocal interaction with people and environment

Figure 2. Nilsson & Durkin's Assessment of Learning Powered Mobility Use Phases and Stages[16,48]

Stages

Exploring Performance, focus on body, device, environment,and activity

Phases of Attention, Activity, Understanding of Tool Use, Expressions/Emotions, and Interaction/Communication

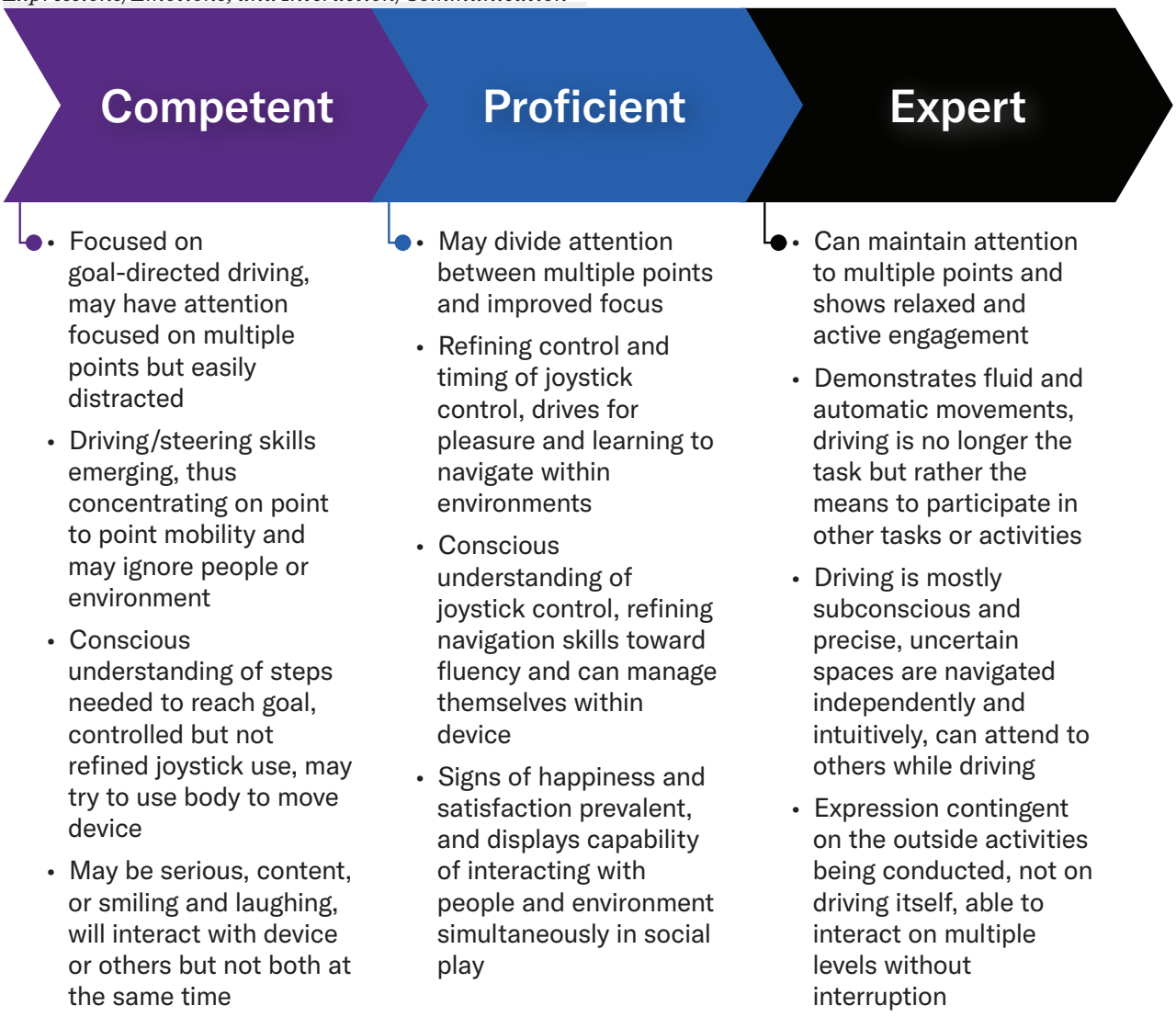


Figure 2. Nilsson & Durkin's Assessment of Learning Powered Mobility Use Phases and Stages[16,48]

It is expected that regardless of age, most children being introduced to powered mobility for the first time will be initially in the Explore Function stage. This also may be true of older children who may benefit from powered mobility but who may not have access to such devices at young ages due to financial, environmental, or cultural constraints. The intervention techniques and strategies presented in this guideline are primarily designed to support infants and toddlers using the Explorer Mini or for learners of other devices in this stage. However, some strategies for learners with more developed driving abilities (operational and functional groups) are also included for completeness and to assist in facilitating progression.

Ability Considerations

While it is not critical for the child to have specific abilities prior to beginning powered mobility intervention, there are indeed emerging abilities that may be advantageous to work on throughout intervention in order to maximize success with the device. This may involve intervention outside of the powered mobility device to prepare for use, or it may involve practice using the device itself as an intervention if the device design allows. For example, trunk control may be practiced outside of the Explorer Mini using traditional therapeutic activities such as sitting and moving on a dynamic surface such as a therapy ball. However, since the Explorer Mini can be used in a sitting, semi-standing, or standing position, trunk control can also be practiced in real-time while using the device. For children with significant impairments or complex needs, or in situations where clinicians have minimal background or confidence with powered mobility introduction, an additional tool that may provide guideline on tailoring powered mobility training is the Powered Mobility Training Tool by Kenyon et al.[50] Understanding a child's existing abilities, learner group or ALP phase will also help facilitate decision-making about when and where to intervene to support the learning process.[16,47]

Example abilities for the Explorer Mini may include:

- Shared attention
    - ◊ In device: The child may practice their awareness of or response to aspects of the device itself, or to toys, objects, sounds, and/or people in the environment depending on their learning phase. The child may demonstrate this ability by banging on the device, pointing at an object, laughing, vocalizing, attempting to gain the attention of another person, etc.
    - ◊ Out of device: Attention may be drawn to the device, or other toys, objects, sounds, and/or people in the environment. The device operation may be demonstrated by an adult in the environment to try and capture the child's attention.

A note about shared attention: Development of the ability to shift attention or engage in shared attention may not occur immediately. However, this learning process affects the ability and motivation of the child to engage with the environment and may lead to a child's ability to explore while simultaneously using the device, during later learning phases.[16]

- Visual fixation
    - ◊ In device: The child may practice maintaining a stable visual field. This can be

facilitated by calling attention to the device features itself (joystick, tray, etc.) or to objects/people in the environment, depending on the child's learning phase. However, it is important to note that visual skills will continue to develop in conjunction with mobility, including for children with cortical visual impairment.[51]

- ◊ Out of device: The child may practice eye-gaze activities with interesting or visually stimulating objects during stationary play or mobility activities.

A note about visual fixation: The ability of both eyes to maintain attention to a fixed target in personal and peri-personal space (up to 18 inches/45.72cm), develops in conjunction with head and trunk control, and affects ability to focus on environmental stimuli during purposeful movement.[16,53–54]

- Trunk and upper extremity control
  - ◊ In device: The child may practice static and dynamic trunk control simply by driving the mobility device, which exerts forces on the trunk and impacts the ability to maintain an upright position while the device is in motion. The child may prop their upper extremities on the tray for additional stability, as needed.
  - ◊ In device: The child may practice reaching for or grasping toys on the tray or suspended close by the child, within the accessible space immediately around the device.
  - ◊ Out of device: The child may practice sitting or standing balance outside of the device, by sitting on a variety of surfaces (i.e. therapy ball, on an adult's lap, on a balance board) and with manual or other support.
  - ◊ Out of device: The child may practice reaching for or grasping toys in sitting or in standing at variable heights and surfaces.

A note about trunk control: Regardless of device type, postural trunk control may be predictive of a child's ability to successfully reach for the joystick and may be considered both as an initial measurement and also as a means to measure improvement through the use of the mobility device.[55,56]

- Head control
  - ◊ In device: The child may practice head control to remain upright while sitting in or while driving the device, including the ability to regain head control in multiple directions. Tactile cues or fading manual assistance may be useful during practice. This is especially important when using the Explorer Mini as no support for head

control is provided in this device.

- ◊ Out of device: The child may practice maintaining static and dynamic head control when outside of the powered mobility device, such as in prone, sitting or standing, or through the use of movement.

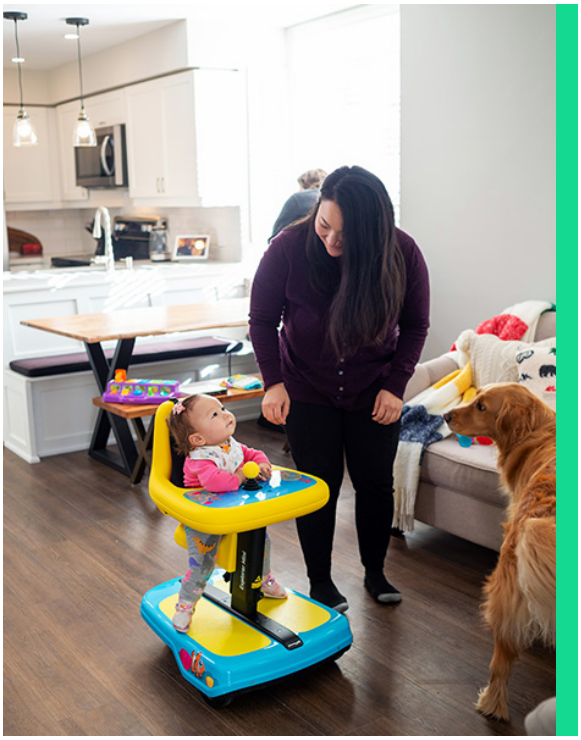
- Use of joystick
  - ◊ In device: The child will develop and practice various methods to access the joystick, using their hand, upper extremity, or mouth. With increased use and exploration of the device, the user may develop the ability to accurately control the joystick with their upper extremity or hand over time. However, this is not the only means of access to the joystick for functional use of the device.
  - ◊ Out of device: The child may practice reaching and manipulating items that may be similar in size, shape, or texture to the joystick, such as a small ball.

- Social-emotional and communication development
  - ◊ In device: Focus on encouraging the child to explore the device, and introduce simple 1-step directions as it pertains to the device (i.e. “push”, “go”). Verbally label items in the child’s environment, particularly items of high interest, motivation, and importance to the child’s exploration. Caregivers can also label the child’s attempts to communicate, such as naming their emotional reactions (i.e. happy, excited, upset, frustrated), and the function of their gestures or actions (i.e. “You want more,” “All done,” “You like to go.”). Child may also practice requesting and refusing with simple words, signs, and approximations (i.e. “more,” “help,” “all done/stop”).
  - ◊ Out of device: The child and a communication partner may practice naming/signing and identifying objects or people in the environment, emotions, body parts, and engaging with simple 1-step directions. Child may also practice requesting and refusing with various modes of communication.

A note about social-emotional and communication development: The child may experience and/or express a range of emotions, including surprise, joy, frustration, or crying at various times during intervention. Communication partners should be consistently responsive to the child’s verbal and non-verbal communication and emotions. Communication partners should also follow the child’s lead of interest and tolerance to interventions.[57]

This is not an exhaustive list, and certain abilities have been intentionally omitted here based on current evidence. For example, while a child may engage in important vestibular play, such

as turning circles or bumping into walls or objects during intervention, both expert consensus and supporting literature suggest that that it is not a priority to provide vestibular movement activities as a specific precursor before introducing a powered mobility device.[58,59] Additionally, while wheelchair skills programs or checklists are available and are useful in specific pediatric populations or to assist in funding justification,[21,28,60] both expert consensus and supporting literature suggest that it is not necessarily a priority for infants and toddlers to engage in wheelchair skills programs as a part of intervention since the focus is on exploration, learning through trial and error, and play.[7,61,62]



What About Dosage?

Dosage may encompass the duration of an intervention session, frequency of sessions, and the number of sessions over a specific period of time. Determining dosage takes into consideration the child's individual abilities, endurance, and motivation as well as the caregivers'. This may also change over time depending on health status, resources, and environment. Experts in the Delphi study reached consensus that it is important to determine an optimal dosage for learning powered mobility based on each child's needs. However, there are no specific recommendations for dosage for powered mobility use in the literature, because this is dependent on the highly individualized needs and goals of children and caregivers.

Literature reports varying frequencies and durations of powered mobility interventions. For example, in the randomized controlled trial by Jones et al, powered mobility devices were used by children for just over 5 hours per week on average over a 12-month intervention, with resulting improvements in self-care, mobility, and receptive communication. Kenyon et al.[63] provided 60 minutes per week for a 12-week intervention with children who have multiple, severe impairments, resulting in improved powered mobility skills and mastery motivation.

While not specifically providing dosage evidence, additional literature and expert consensus does indicate it is important to encourage frequent and flexible opportunities to use the device and ample repetition during intervention.[16,32,65] Evidence regarding dosage will likely continue to evolve with future research.

Communication and Language for Powered Mobility Introduction Across All Learning Stages

One of the strengths of this guideline comes from the multidisciplinary developer team, including physical and occupational therapists, caregivers, and speech language pathologists. It is well established that early motor development is directly tied to early language development.[66–69] Speech and language disorders can accompany or result from many conditions that interfere with the development of perceptual, motor, cognitive, or socioemotional function, including conditions such as Down Syndrome, Cerebral Palsy, fragile X, autism spectrum disorders, traumatic brain injury, and more.[70]

As a child begins to develop new motor skills through the use of the Explorer Mini or another powered mobility device, this is an invaluable opportunity for concurrent language growth and development.[36,51,71] Children learning new skills (such as use of the Explorer Mini) build on their prior/current knowledge through scaffolding strategies, just beyond the level of what the child can do alone (known as the Zone of Proximal Development).[72] Best-practice guidelines for children with motor impairments recommend evaluating across multiple domains and disciplines (including speech-language pathology) as well as obtaining information from multiple sources.[73,65,66]

A licensed speech-language pathologist (SLP) can evaluate and provide beneficial direct or consultative services beneficial as a part of a multidisciplinary intervention team. For example, SLPs can assess receptive language to tailor verbal or auditory cues used during powered mobility introduction that are appropriate for a child's current communication skills.[73–77] It is important to note that receptive and expressive communication may vary considerably based on a child's age, abilities, or health status. Although the following abilities are not prerequisites for powered-mobility introduction, it is helpful to know and understand a child's receptive, expressive, and social-emotional abilities to tailor interventions appropriately[78] :

Does the child...

- Respond to their name when called?
- Follow simple, 1-step directions (touch it, give me, push it, take it, let's go)?
- Demonstrate shared attention (two people attending to the same object)?
- Understand some prepositions (in, on, under)?
- Identify body parts (hands, feet, head)?

- Play with objects in a functional or symbolic way?
- Identify preferred items/toys/people?
- Imitate actions of adults or children in their environment?
- Use words, signs, gestures, or approximations to request or refuse?

Exploration and engagement with objects, together with caregivers or peer groups, promotes the development of shared attention, which is the foundation for the development of communication and learning.[57] Be aware of and respond to the child's verbal and nonverbal communication to promote their desire for social interaction during exploration. Clinicians and caregivers should work closely together to identify the child's various means and functions of communication and interaction through vocalizations, gestures, movements, or facial expressions. A helpful tool that may be collaboratively used to assess a child's early communication skills is the Communication Matrix, available at https://www.communicationmatrix.org/. This is a free, research-based assessment tool to help caregivers and professionals easily understand the communication status, progress, and unique needs of an individual functioning at the early stages of communication or using forms of communication other than speaking or writing. It is available both online and offline, and in multiple languages.[79]

To further aid caregivers and clinicians, Appendix 1 includes a list of the most common core language words used between 12-36 months of age in Standardized American English, which can be readily incorporated into powered mobility introduction.[78,80,81] Below are additional evidence-based recommendations for language considerations from studies that have evaluated the connection between motor and language development in children with motor impairments. These strategies should be implemented while talking about the device, associated activities, and throughout device use during a child's daily routine.

- Use simple and consistent language. Focus on using comments and statements rather than asking many questions in early learning stages. If the learner is at an early developmental level, it is important to use single syllable words when possible and imperative language for concept formation.[16,82]
- Utilize the "right label at the right time" approach to language and input. When a child physically engages with an item (picks it up, shakes it, gives it to an adult, moves the joystick, etc.), the clinician/caregiver should label the item/action to teach receptive and

expressive language concepts.[83] Provide labels verbally, with a sign, and/or with augmentative/assistive communication, as determined by the needs of the child and their communication partners.[84]

- Strategies for increasing engagement and providing a language-rich environment to foster language growth include [82]:
  - ◊ Sit face to face with the child.
  - ◊ Observe the child; wait and look at them expectantly; listen carefully and acknowledge any words or sounds they make.
  - ◊ Create opportunities for the child to initiate communication.
  - ◊ Follow the child's lead in play; join them where they are.
  - ◊ Imitate the child's noises, words, facial expressions.
  - ◊ Interpret what you think the child is trying to tell you with their words, sounds, actions.
  - ◊ Comment on what the child is doing. Use short phrases to describe what they are doing.
  - ◊ Expand on what the child says or does. Imitate what they say/do, and 1-2 more words or gestures/steps.
  - ◊ Take turns at the same rate and pace of the child. Follow their interests. The child may need reminders or helping taking a turn. Hold out your hand, provide hand over hand support, or verbally cue.
  - ◊ Ask questions that keep the conversation going, that the child may be able to respond to (verbally or otherwise), such as: make a choice, yes/no questions, wh- questions (who, what, where). If a child does not give a response to the question, the clinician/ caregiver should model an appropriate response.
  - ◊ Allow wait time (5-10 seconds) before responding, taking another turn, modeling an answer to a question, or providing assistance. This gives the child the opportunity to initiate or respond.

Clinicians and parents can find more resources and guidance on language to use to support learning, based on various stages of a child's development here: http://www.hanen.org/Helpful-Info/Parent-Tips.aspx

Summary of Intervention Techniques

The remainder of this guideline is structured to provide a global summary of intervention techniques for powered mobility introduction that have been specifically developed and curated for different learning stages. It represents a synthesis of seminal work previously published in the field of pediatric powered mobility, in addition to broader theory and empirical studies in physical therapy, occupational therapy, speech language pathology, and child development applied to powered mobility learning. Following a brief discussion of preparatory considerations, additional techniques are presented according to Nilsson & Durkin's[16] learner phases and stages. Clinicians and caregivers are also encouraged to review the original work referenced throughout the guide for additional strategies and resources for successful powered mobility introduction.[16,28,47,85–87]

It is important to note that there is no single, optimal approach for powered mobility learning.

In the critical developmental stages of infancy and toddlerhood, children are constantly changing as they adapt to the affordances of their bodies and brains, their devices, and their environments as they progress through the various powered mobility learning stages. Clinicians and caregivers are facilitators of learning by structuring the environment and interventions appropriately, and providing opportunities for children to learn as a "responsive partner" who will engage with the environment to a greater extent.[49] Clinicians also have unique or preferred approaches to guiding experiences in partnership with children and caregivers. Additionally, it is important for clinicians to ensure caregivers feel educated and empowered to do the same in their home and community environments.[18] Taking a flexible rather than rigid approach to the following techniques will help facilitate success, especially when children are expressing frustration during the learning process.[16]

Safety Considerations

Safety is a priority when using a powered mobility device, just as it is for all infants and toddlers learning to explore and navigate their environments. It is essential that clinicians and caregivers who are using the Explorer Mini or any other powered mobility device have reviewed the device-specific User's Manual in detail prior to any use of the device. Please access the Explorer Mini User's Manual via https://www.permobil.com/ and then select for your region/ location for applicable documentation.

To ensure safety of the child during practice sessions, please consider the following:

- Ensure the device is in working order (properly charged, no fluid leaking, loose components, exposure to wiring or sharp edges)
- Clean the device appropriate to the setting. If the device is shared by multiple children within a facility, use with facility-approved disinfectant wipes before after each use. For home use, routinely wipe down the device with a household disinfectant.[88] Appropriate hand washing should be practiced by all involved.
- It is important for the child to feel both physically and psychologically safe while using the device. If the child becomes upset (i.e. crying, screaming, or showing general signs of distress or fatigue) try to comfort or distract the child in the situation to make device use a positive experience, however, discontinue or shift the focus of the intervention if these stress signs persist. Exercise clinical judgment in these situations in order to determine if the intervention session should be continued following a break. Frustration is to be expected, especially as the child learns a new skill and experiences new sensations, however, it is counterproductive to continue a session if the child is upset and cannot be calmed or redirected.[16,19]
- It is paramount that the adults involved in the intervention provide close adult supervision, and are prepared to promptly intervene as needed for safety.
- Although free exploration is desirable, adults should always intervene in a calm way when potential safety hazards may exist.
- It is important that the adults permit the child ample space and freedom to explore and practice independently (within the limits of safety).
- Examine and modify the environment to minimize risk of injury. Cushion table corners/edges if at head/body-level with the child. Ensure tables, chairs, and other furniture in the driving environment are sturdy enough not to be knocked over in case of incidental contact or bumping. Ensure fragile items or items that may tip off a surface if bumped are secured or out of the way. Remove or block spaces that the child could get stuck or hurt (e.g under tables, between tight spaces). Ensure steps/staircases are blocked off to reduce injury.
- Allow the child to “bump” safely into walls or other suitable objects in the environment through trial and error. This may promote cause and effect understanding as the child realizes the permanence of the objects and that they need to do something different with the joystick to keep moving. This is thought to facilitate a variety of skills including depth perception, cause/effect and judgement.[18,32]

In the Delphi study, expert consensus was reached on a recommendation statement that caregivers/clinicians take immediate steps to remedy any issues with the child, posture, powered mobility device, controls, or the environment that may limit learning. However, it is important to note that current literature suggests that delayed response attending to these issues (within the limits of safety) may actually present an opportunity for learning in areas such as mastery motivation, problem solving, and skill acquisition such as steering.[18,89] This is especially important in children with more complicated physical, sensory, or access needs who may benefit from additional learning time.[90,91] In these situations, clinical judgement and collaborative conversation may assist in determining the appropriate course of action.

Preparatory Considerations

Preparation allows the child the opportunity to explore the powered mobility device and become familiar with it in their environment before they are placed in it.[47] It also offers opportunities to practice developmental activities outside the device that may enhance or support the child while in the device. Preparation is also essential for psychological safety- to acknowledge and ease any fears the child has of the device and create a smooth transition for the child to be placed in it. It should also spark their interest in using the device.[16] Research has shown that there is a significant and reciprocal relationship between exploration and action, perceptual development, and cognition- in other words, we learn to move, and move to learn within our environmental contexts through exploration.[92,93] While the guidance below is designed for use with the Explorer Mini, many strategies may also be relevant for other devices or children in other age groups.

Preparatory Guidance

- If possible, have the Explorer Mini near the child to begin their exposure to the device. Initially do not expect any outcome from the first encounter, other than increasing familiarity and creating a positive experience for the child and caregivers.[18] Some children may need more than one opportunity to explore the device prior to moving in the device.

- Preparation should be child-led and allow the child to safely explore the device and the environment in developmentally appropriate ways.[94]

- Clinicians and caregivers should collaboratively establish reasonable expectations for learning based on the child's current learning stage and level of play and interaction, and select corresponding toys and activities. Refer to the Westby Play Scale (Appendix 2) to determine the child's current stage of play and associated expected language use, and use it to monitor the child's growth for future intervention planning.[95] Keep in mind that motor or language impairment may affect participation in play skills on this scale.

- Determine motivators in partnership with caregivers.[18]
    - ◊ This may be done through an interest inventory, parent interview, or observation during unstructured play.[96,97]
    - ◊ Consider the child's favorite toys and preferred or enjoyable activities.
    - ◊ Appendix 3 includes interest inventories created by the Center for the Advanced Study of Excellence in Early Childhood and Family Support Practices, which are valuable tools to assist in identifying motivators, caregiver goals, and daily routines that are meaningful for families.[97]

- Evaluate or discuss with caregivers the child's emerging abilities as described earlier in the 'Ability Considerations' section (head and trunk control, joystick access, visual abilities, attention, and social-emotional and communication).

- Decide in partnership with caregivers whether you plan to introduce the device in a sitting or standing position.
    - ◊ If the child has emerging trunk or lower extremity strength and requires significant support for weightbearing, consider a seated driving position.
    - ◊ If the child can achieve partial to full weightbearing through their lower extremities or has other early intervention goals related to standing balance or strength, consider a standing driving position.

- ◊ Driving position is simple to adjust and can be tailored based on the needs of the child, the environment, and individual mobility goals.

- Playing by or around the device may be useful to orient a child to its presence and features.
  - ◊ It is developmentally appropriate for a child to pull to stand and walk around the device while holding on, once the child has gained adequate postural stability.[98]
  - ◊ An adult must have hands on the Explorer Mini while the child is standing along the outside of the device, as it only weighs 52 lbs/23.6kg and presents a potential tipping risk for the child (especially for those close to 35 lbs/15.9kg).

- If the child does not appear to be interested in exploring the device, clinicians and caregivers may draw attention to it to promote engagement and longer visual attention, as surprising events generally result in infants looking at objects longer.[99] Examples related to the Explorer Mini or other joystick-driven powered mobility devices include:
  - ◊ Play 'hide and seek' with the device or joystick.
  - ◊ Touch the joystick and show that the device moves (exploring cause and effect).
  - ◊ Bang on the device to direct attention, or press the horn.
  - ◊ Incorporate the child's favorite toy with the device.[35]
  - ◊ Increase your level of direction and assistance with the child:
    - Visually direct the child to the device.
    - Increase verbal cues for direction to the device.
    - Provide hand over hand assistance to touch the device or interact with the joystick.
  - ◊ Modify your speech, gestures, and the timing between gestures and speech to capture the child's attention.[100–105]

- Note that developmentally younger children may primarily use mouthing or oral exploration to gather information about an object. It allows them to map tactile information to the visual properties of the object.[93,106]

- Note that developmentally older children may use more visual exploration and/or alternate between oral and visual explorations or use multimodal object exploration This may include the child banging on the device, feeling it, and looking at it from multiple viewpoints.[93, 107, 108]

- ◊ Exploring objects using multiple different senses is important for the development of cognition and perception.[93,109]
- ◊ Visual, tactile, proprioceptive, and auditory information all become important during object exploration in order to provide a richer source of information about the objects.[109,110]

Early Learning Stages

Exploring Function, focus on body and device

In these early learning stages, it is important to focus on establishing trust and building a secure relationship.[16] Attention is primarily focused on the body and the device, so minimizing additional distractions and adjusting expectations to the stages of learning is critical. It is also important to familiarize the child with being positioned in the device, with no expectation for actively moving or engaging in other activities. For some children, this may be their first experience with self-initiated mobility. Thus, exploring the device before engaging in activation of the joystick can increase positive associations with the device. These positive associations and experiences can provide a strong foundation for purposeful activation of the joystick and movement within the device during subsequent learning stages.[111] For infants and toddlers, this means approaching the exploration stage of introduction to the Explorer Mini or other powered mobility devices as play. Seminal literature across disciplines denotes the importance of structuring activities as play, as this promotes emotional well-being, curiosity and meaning-making, mastery motivation, agency, and most of all, fun and enjoyment.[23, 55, 98–102]

Device Setup

It is important for the clinician or caregiver to ensure that the child has proper positioning and support. The seat height should be adjusted as necessary prior to the child entering the device and based on prior collaborative decision making for driving position. Refer to the User's Manual for adjustment instructions.

- Possible interventions for increasing willingness to enter device immediately before

exploration:

-
  - ◊ Place the child's favorite toy in the device, play on the tray, or interact positively with the device.
  - ◊ Place a training doll that is similar size to the child in the device and demonstrate the doll using the device.

- Possible approaches for securing the child in device:
  - ◊ Encourage pull-to-stand at the device if appropriate, adults should have hands on the device to stabilize it if using this technique, as described in the previous section.
  - ◊ Place the child in device with child assisting as appropriate, using verbal cues for placement of upper and lower extremities.
  - ◊ Verbally describe each action/movement required to secure the child in the device including but not limited to: lifting, wiggling, bumping, foot contact, seat contact, tray contact.
  - ◊ Verbally assure the child of their continued safety.

- After the child has entered the device, assess seating height; adjust to ensure optimal body positioning as detailed below:
  - ◊ Feet should be firmly on the support surface.
  - ◊ If using the seat, knees should be positioned at about 90 degrees with full weight bearing across femurs on the saddle seat.
  - ◊ Whether using the Explorer Mini in a seated or standing position, adjust the tray to support the upper body at elbow height.
  - ◊ Be sure the child can easily reach the joystick using a consistent method of access (i.e. hand, elbow, mouth) .[16,53,116]
  - ◊ In the Delphi study, consensus indicated that it is important to recognize the need for modification of the joystick or other access method based on motor capabilities of the child. However, this is not possible on the Explorer Mini due its fixed, midline joystick position. Notably,

previous literature describes developmental benefits of a midline joystick position for learning powered mobility.[16,117]

Device Use

- Have the child in a natural environment such as their home or in a familiar setting in the clinic.

- Limit distractions, as much as possible, in order to encourage the child to interact with the device. Fewer distractions lead to a higher quality of play.[118]

- Avoid harsh overhead lighting and excessive noise, if possible, in order to limit overstimulation and distractions from the surrounding environment--the goal is to set the environment up in order to help facilitate focus and attention on the device.[119] When considering lighting, strive to use natural light as much as possible. However, when this is not feasible, consider balancing the need for illuminating the environment and preventing glare. Combination lighting, followed by fluorescent lighting are considered the best alternatives to natural light for this reason.[120] Excessive auditory and visual stimulation may have a negative impact on the user's ability to learn, especially if the task requires focused attention.[121]

- Follow the child's interests, rather than adult-led interests, throughout each session.[16,82]

- Do not overcrowd the child. Allow as few individuals as possible in the room with the child and have only one individual at a time guiding the child when needed.[32,89] Move in and out of the child's space to demonstrate that the child is taking the lead for exploration or movement. Move back in the space to provide physical guidance or prompts as needed.[16]

- Try to remain at child's eye level throughout the session. Using a rolling stool or desk chair is a good recommendation for clinical or home setup.[122]

- Encourage physical and social interaction with the child on or around the device. With increased opportunities for object manipulation and exploration, infants and toddlers have increased opportunities to gather information about themselves and their environments.[92]

    ◊ Name the device parts, body parts, and actions produced by the child. This is a critical component of lexical development, or the discovery of the meaning of different

words and actions.[57] It also allows for instances of guidance without physical contact, when appropriate.[90]

- ◊ Use physical guidance, such as hand-over hand assistance, to touch the various parts of the device. This may also include actions such as pushing or pulling, touching, or grasping.[16]
- ◊ Use simple language (verbal, sign, and/or augmented) with the child that is at or just above their corresponding stage to support concurrent language growth.[84,123] Consider reading a story to a child while they are in the device which may build device tolerance, provide calm or distraction for the child if upset, or increase alertness.
- ◊ Provide a toy, stuffed animal, or craft item (i.e. yarn balls or crayons/paper) on the tray to encourage interaction on the device.
- ◊ Adjust or modify cues, pressure and/or contact location as needed based on the child's response.[16,89]

- Mastery Motivation, or the internal desire for young children to explore and develop agency within their environment, is influenced by accessibility, safety, and space to play and interact with familiar and novel objects without structured direction.[89] Creating an environment for children using the Explorer Mini that supports these principles (i.e. child being in control of making the device move) may impact a child's mastery motivation and emerging self-efficacy.[18,124]
  - ◊ Allow the child time to act spontaneously as well as react to physical guidance or prompts, when given.[16]
  - ◊ Allow for periods of inactivity and silence to allow time for reflection or processing and facilitate spontaneous exploration.[16]

Feedback and Cueing

During the exploration period of introduction, allow the child unstructured time to be in the device to gain familiarity and comfort and explore in their own way.

- Incorporate multi-modal cueing for the child and within the environment.
  - ◊ Attach bells or other noise-makers to the device to create noise when the device moves, if it evokes a positive or neutral response from the child (do not do this if this causes an aversion for the child).
  - ◊ Attach bells or other noise-makers to boundaries in the space. If the child comes

in contact with the boundary, a noise will sound, indicating something has changed and the child can correct course with assistance when needed.

- ◊ Add different, pleasurable textures added to the surface of the joystick (ensure these do not interfere with joystick movement)

- Acknowledge the child and the action when the device moves, regardless of whether or not activation was purposeful, accidental, or exploratory.[16] Clinicians should consider what type of feedback is best for each individual child based on past clinical experiences or caregiver input.[125]
  - ◊ Types of encouragement can vary and may include using a calm, positive tone of voice, smiling, reassurance, encouraging gestures (head nodding, soft clapping, dancing, etc.)
  - ◊ Smiles from caregivers are positively associated with a child's motivation, while physical interruptions or negative verbal feedback are negatively associated with motivation.[126]
  - ◊ Interference or desire for control from caregivers has been linked to decreased activity enjoyment and motivation.[89,127]

- Acknowledge frustration or anxiety, and establish frustration tolerance, attempting to calm or redirect the child first. Discontinue the session if child remains crying, yelling, pushing, hitting, or newly disengaged (i.e. showing signs of fatigue, looking away or closing/rubbing eyes).[128, 129]

- Provide Knowledge of Performance feedback (i.e. describe what the child did, "You used your hand to make the chair go!" or "You pushed the joystick with your arm and bumped the wall!").[130]

- If the child is not spontaneously exploring the joystick, use verbal cues, gestures, tactile cues, or a combination of these to encourage exploration. Use direct language, be as specific as possible, and avoid unnecessary words.[131] Allow the child ample time to register the prompt and explore the device.[82,132] Do not move on to a different prompt without at least two to three attempts of the previous prompt. Consider a variety of prompts that may include:
  - ◊ Say "Look!" (and tap or gesture to the joystick)
  - ◊ Say "Look at the yellow ball!" (and tap or gesture to the joystick)
  - ◊ Gesture to the joystick.

- ◊ Gesture to the joystick and say, “Yellow ball,” and wait for the child to respond to or imitate the adult’s pointing or words.
- ◊ Gesture to or tap the joystick and say, “I found the yellow ball. You find the yellow ball.”
- ◊ Keep your hand on the joystick and say, “I found the yellow ball. You find the yellow ball.” Then, remove your hand.
- ◊ Using hand over hand guidance with the child, tap the child‘s hand on the yellow ball and say, “You found the yellow ball!”
- ◊ Using hand over hand guidance, place pressure on the joystick so the device moves and say, “The yellow ball makes the chair move.”

Intermediate Learning Stages

Exploring sequence, focus on body, device, and environment

The next stages of learning powered mobility allow the child, with or without assistance from clinicians or caregivers, to operate the joystick in order to purposefully explore their environment, in addition to their body and the device.[16] Developmentally appropriate incentives, such as toys and/or trusted adults will be incorporated within this stage inorder to motivate the child and further facilitate learning.[21, 47] These stages are marked by a child beginning to engage in goal-directed movement of the device.

A gradual increase in the complexity of both tasks and processes as well as greater attention to the environment related to powered mobility use occurs in these stages.

Device Setup

Considerations for device setup are similar to those listed for the previous learning stages. However, additional experimentation with device positioning and exploration of different device speeds may be introduced.[16]

Device Use

- Clinicians or caregivers should consistently monitor and adjust the driving goals, child’s

behaviors and responses to provide a “just right challenge” and offer “just right feedback” during a driving session.[16,49]

- Engage siblings or peers in the training environment to encourage shifting or shared attention if the child is appropriately challenged and not distracted by this addition.
- Introduce the idea of graded joystick movements in midrange rather than end range to facilitate understanding of proportional joystick use.[16]
- Provide motivating toys, activities, or people within the driving space to encourage goal-directed driving.[16]

- Gradually increase complexity of interaction.
- Gradually increase the distance or space of an interaction.
- Consider practice in different environments with varying levels of activity or complexity.[47]
- Continue intermittent use of physical, verbal, or gesture guidance but intersperse these with quiet observation to allow the child to engage in problem-solving in their own way, demonstrate initiation, and develop self-efficacy.[16]
- Activities may need to be simplified into smaller components or scaffolded (by providing additional support) to facilitate success.[16]
- Continue use of simple language, naming objects and actions. Add language about the environment with the child that is at or just above their corresponding linguistic stage to support concurrent language growth.[84,123] Continue to use verbal, sign, and/or augmented communication as appropriate based on the child’s needs.
- Ask if the child would like help, or wait to see if child requests help either verbally or non-verbally.[16]
- A more structured, task-oriented approach may be introduced to support learning of goal directed mobility in these stages, based on child response. This type of training was identified in a systematic review as being utilized in 33.3% of studies reviewed, suggesting that structured, goal-directed training is one style of intervention technique that has been successfully implemented in past studies.[21]
    - ◊ With the child in the device, show the child a toy or other desired object or person within arm’s reach to motivate the child to move toward it.[61] Place the selected item

approximately 1 ft. in front of the child at eye level (un-occluded, unobstructed). By doing so, the child is more likely to initiate movement, which may foster motivation to continue use of the device.[124]

- ◊ Show the child the desired object/person and say, “Look! It’s (toy name or adult name)!” and gesture towards the t object/person.
- ◊ If the child does not place his or her hand spontaneously on the joystick, the researcher, clinician, or caregiver should place the child’s hand on the joystick and then say, “Let’s go get (toy name or adult name).”
- ◊ The caregiver or clinician may then use hand-over-hand assistance to propel the device forward to reach the toy.
- ◊ Once the child has experienced success with an object within close proximity, the clinician should gradually increase the distance of travel to the object.
- ◊ Allow for several trials of guided forward driving. The adult should provide fading hand-over-hand assistance, promoting the child to take more control over activation of the device. Adjust the amount of assistance given based on the needs of the child, but it is important to give the child autonomy and control over the device as soon as possible. Nilsson & Durkin[16] also suggest moving from proximal to distal when providing physical assistance.
- ◊ Once the child has experienced success with an object within close proximity, the clinician should gradually increase the distance of travel to the object.
- ◊ Allow for several trials of guided forward driving. The adult should provide fading hand-over-hand assistance, promoting the child to take more control over activation of the device. Adjust the amount of assistance given based on the needs of the child, but it is important to give the child autonomy and control over the device as soon as possible. Nilsson & Durkin[16] also suggest moving from proximal to distal when providing physical assistance.

- ◊ After completing the selected number of forward trials, move the incentive in other directions (i.e. left, right) and repeat the above strategies using fading hand-over-hand assistance and cues. Structured directional trials and structured cues have been used successfully in the literature for this purpose.[133]

Feedback and Cues

- The clinician or caregiver may use visual, tactile, or auditory cues to improve attention and facilitate skill acquisition.135 Examples include:
  - ◊ Barriers or barricades in the environment used to denote boundaries
  - ◊ A picture of the joystick to cue/remind the child to touch the joystick to move the device.
  - ◊ Verbal prompts from caregivers/clinicians for positive engagement with the device (i.e. positive verbal praise with an excited or soothing voice: "Yes, you touched the joystick!" "You did it!" "Very good." "You are moving.")
  - ◊ Ground coverings at or just beyond driving boundaries (i.e. carpeting that is harder to drive on; bumpy floor covering when the child goes beyond their boundary).
- Encourage the child to take initiative and conduct their own learning through trial and error (i.e. "What other ways can you try?" or "Let's see if that works.").
- Acknowledge frustration, especially when the driving goal is understood but not achieved by the child.[16]
- Allow mistakes to happen and encourage child to identify their own solution.

Advanced Learning Stages

Exploring Performance, focus on body, device, environment, and activity

These advanced stages of learning are a period of faster-paced and more complex interaction between a child, the device, their environment, and a purpose, activity, or occupation.[16] A child may be capable of navigating more complex environments with improved precision, less need for supervision, and increasing independence with goal-directed driving.[16] It is still a critical point for ensuring safety as powered mobility use becomes more refined and transitions from a conscious activity to an increasingly more automatic activity. Clinicians and caregivers continue to play an important role in facilitating learning. Children who reach these advanced stages of learning may participate in group learning activities and are generally thought to be proficient or soon-to-be proficient powered wheelchair users in the community.[16,47] As Ragonesi & Galloway,[40 p147] propose, "Functional and safe community driving will not efficiently emerge from a controlled, experimental environment, but rather only with continued daily practice within the community, enriched by the assistance of clinicians, early educators, families,

and/or peers." Thus, setting realistic mobility expectations with families and ensuring opportunities for community exploration and learning in enriched environments during these stages is critical.

It is important to note that it is uncertain whether Explore Mini users, or infants and toddlers in general, would typically reflect this stage of learning. While a description of all stages of learning is important for this comprehensive guideline, if children do demonstrate learning at this level of performance, it may be appropriate to consider progression to other powered mobility devices. Additionally, the low ground clearance and small wheels of the Explorer Mini may impact navigation of more varied terrain that is recommended during this stage.

Device Setup

Considerations for device setup are similar to those listed for the previous learning stages. However, additional attention to increasing device speeds is recommended in this stage to ensure that proficiency, safety, and joystick responsiveness are maintained with further degrees of freedom.[16]

Device Use

- The child may be encouraged to use the device in everyday, less controlled environments.
- Games or unstructured free play may offer a greater focus on co-creating a successful learning environment and responding to in-the-moment cues and actions between the child and caregiver or clinician.[49]
- While maintaining safety is critical, it is important to allow learners in these stages to take perceived risks during driving play (though these behaviors may not entail actual risk), as experiencing perceived risk has been reported as a key factor in child motor and identity development.[135,136]
- Clinicians and caregivers may feel more anxious or uncomfortable as there is not a set sequence of activities or cues to help facilitate a driving session. However, use of this approach is critical to develop agency and autonomy in infants and toddlers with disabilities at the appropriate learning stages. This is especially crucial since the literature demonstrates higher rates of passivity in children with disabilities compared to their

peers without disabilities, as well as decreased opportunities for unstructured play, movement, and social interaction.[135,137]

- Clinicians and caregivers should encourage imaginary play, respond to spontaneous driving goals whether indicated by the child or simply observed, but provide minimal adult direction around these activities.[138]

- Clinicians and caregivers should scaffold the child's existing learning within the zone of proximal development by facilitating or encouraging activities that the child may not be able to do alone, but could be achieved with minimal guidance. This space for learning is known as the zone of proximal development.[138]

- Ensure access to unstructured play materials that may be motivating for the child to drive to, such as balloons, water play items, favorite toys or people, etc. but encourage the child to determine how their engagement with these items unfolds.

- Consider training in small groups of similar powered mobility learners, and also consider outdoor driving.[16]

- Practice navigation through smaller spaces like doorways, or over uneven surfaces like thresholds, gravel, or carpet.[16,43]

- If a session will be more structured, co-create and agree upon structure together with child and caregiver.[16]

- Encourage the child to pay attention to the safety and care of others, in addition to their own bodies and device.[16]

- Depending on the phase of learning within this stage, children may be encouraged to do a short trip on their own with a caregiver positioned appropriately (i.e. "Go find mom out in the hallway").[16]

- Continue use of diverse auditory and physical environments, ranging from silence to background noise to conversational turns with simple or more complex questions/ dialogue. Also provide increasingly challenging tasks such as directional driving or clockwise/counterclockwise movement.[16]

Feedback and Cues

- Engage in verbal dialogue with more sophisticated language and name expressions or emotions associated with device use outcomes and consequences.[16] Examples may include:
  - ◊ "Let's go to the park (or other location)!"
  - ◊ "Where do you want to play?"
  - ◊ "You went to the kitchen and got a snack! Yummy!"
  - ◊ "You found your toy and now you can play. That's fun!"
  - ◊ "You found/bumped/ran into the table."
- Provide verbal instructions for a task-based activity then let the child carry out the task using their own strategies. For example:
  - ◊ "Your toys are in your room. Go get them!"
- Provide anticipatory cues to children about what to expect in more complex driving environments.[16] For example:
  - ◊ "We are going outside, it will be bumpy!"
  - ◊ "Look, there is a doorway, you will go through it."

Conclusion

This guide sought to provide an evidence-based, partnership-oriented, and interdisciplinary approach to the introduction of the Explorer Mini and other pediatric powered mobility devices for infants and toddlers. The material presented in this guide may also pertain to other children at varying ages and stages of development to support the introduction of powered mobility as one aspect of multimodal mobility intervention for children with disabilities. For all children, mobility is not an end goal, or the ability to simply move from one destination to another, but rather represents a means to maximize participation, exploration, and promote agency and positive identity across the lifespan. The Explorer Mini is one such device that may contribute to achieving these goals.

This guide was developed as a collaborative, international effort among more than 40 occupational therapists, physical therapists, speech-language pathologists, and caregivers and represents consensus of these groups as well as an extensive review of existing evidence. The guide and the associated appendices are meant provide multidisciplinary resources for successful integration of powered mobility into the daily lives and re/habilitation experiences of infants and toddlers with disabilities. The ultimate goal of this work is that it provides a foundation for evidence-based and collaborative powered mobility intervention, identifies unique contributions and collaborative opportunities between disciplines, reveals continued knowledge gaps and practice challenges, and fosters future research directions. Collectively, we have many opportunities yet to explore!

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References

In press: Sabet A, Feldner HA, Tucker J, Logan SW, Galloway C. ON Time Mobility: Advocating for MobilityEquity. Pediatric Physical Therapy. In Press.

1. Nilsson L, Eklund M, Nyberg P, Thulesius H. Driving to learn in a powered wheelchair: The process of learning joystick use in people with profound cognitive disabilities. Am J Occup Ther. 2011;65(6):652-660. doi:10.5014/ajot.2011.001750

2. LeRoy K, Boyd K, De Asis K, et al. Balancing Hope and Realism in Family-Centered Care: Physical Therapists' Dilemmas in Negotiating Walking Goals with Parents of Children with Cerebral Palsy. Phys Occup Ther Pediatr. 2015;35(3):253-264. doi:10.3109/01942638.2014.925028

3. Egan M, Dubouloz CJ, Von Zweck C, Vallerand J. The client-centred evidence-based practice of occupational therapy. Can J Occup Ther. 1998;65(3):136-143. doi:10.1177/000841749806500303

4. Marr D. Fostering full implementation of evidence-based practice. Am J Occup Ther. 2017;71(1):1-5. doi:10.5014/ajot.2017.019661

5. Beard A. Speech, language and communication: a public health issue across the lifecourse. Paediatr Child Heal (United Kingdom). 2018;28(3):126-131. doi:10.1016/j.paed.2017.12.004

6. Field DA, Miller WC, Ryan SE, Jarus T, Roxborough L. Exploring suitable participation tools for children who need or use power mobility: A modified Delphi survey. Dev Neurorehabil. 2016;19(6):365-379. doi:10.3109/17518423.2015.1004763

7. Livingstone R, Paleg G. Practice considerations for the introduction and use of power mobility for children. Dev Med Child Neurol. 2014;56(3):210-221. doi:10.1111/dmcn.12245

8. Plummer T, Ito M, Ludwig F. Participatory Action Research to Determine Essential Elements of a Wheelchair Assessment. Internet J Allied Heal Sci Pract. 2013;11(4).

9. Bray N, Kolehmainen N, McAnuff J, et al. Powered mobility interventions for very young children with mobility limitations to aid participation and positive development: The empower evidence synthesis. Health Technol Assess (Rockv). 2020;24(50):1-194. doi:10.3310/hta24500

10. Wang RH, Kenyon LK, McGilton KS, et al. The Time Is Now: A FASTER Approach to Generate Research Evidence for Technology-Based Interventions in the Field of Disability and Rehabilitation. Arch Phys Med Rehabil. 2021;102(9):1848-1859. doi:10.1016/j.apmr.2021.04.009

11. Rodby-Bousquet E, Paleg G, Casey J, Wizert A, Livingstone R. Physical risk factors influencing wheeled mobility in children with cerebral palsy: A cross-sectional study. BMC Pediatr. 2016;16(1):1-8. doi:10.1186/s12887-016-0707-6

12. Gefen N, Rigbi A, Weiss PL. Reliability and validity of pediatric powered mobility outcome measures. Disabil Rehabil Assist Technol. 2020;0(0):1-6. doi:10.1080/17483107.2020.1819449

13. Parette P, Jack J. Family-Centered Decision Making in Assistive ' Iechnology University of Arkansas for Medical Sciences. 2000;15(1):45-55.

14. Currier BA, Jones MA, DeGrace BW. Experiences of Families With Young Power Wheelchair Users. J Early Interv. 2019;41(2):125-140. doi:10.1177/1053815118819204

15. Wiart L, Darrah J, Hollis V, Cook A, May L. Mothers' Perceptions of Their Children's Use of Powered Mobility. Phys Occup Ther Pediatr. 2004;24(4):3-21. doi:10.1300/J006v24n04_02

16. Nilsson L, Durkin J. Assessment of learning powered mobility use—Applying grounded theory to occupational performance. J Rehabil Res Dev. 2014;51(6):963-974. doi:10.1682/JRRD.2013.11.0237

17. Adolph KE, Hoch JE. Motor Development: Embodied, Embedded, Enculturated, and Enabling. Annu Rev Psychol. 2019;70(1):141-164. doi:10.1146/annurev-psych-010418-102836

18. Huang HH. Perspectives on early power mobility training, motivation, and social participation in young children with motor disabilities. Front Psychol. 2018;8(JAN). doi:10.3389/fpsyg.2017.02330

19. Tefft D, Guerette P, Furumasu J. The Impact of Early Powered Mobility on Parental Stress , Negative Emotions , and Family Social. Published online 2011:1-12. doi:10.3109/01942638.2010.529005

20. Kenyon LK, Farris J, Brockway K, Hannum N, Proctor K. Promoting Self-exploration and Function Through an Individualized Power Mobility Training Program. Pediatr Phys Ther. 2015;27(2):200-206. doi:10.1097/PEP.0000000000000129

21. Kenyon LK, Hostnik L, McElroy R, Peterson C, Farris JP. Power Mobility Training Methods for Children: A Systematic Review. Pediatr Phys Ther. 2018;30(1). doi:10.1097/PEP.0000000000000458

22. Kling A, Campbell PH, Wilcox J. Young children with physical disabilities: Caregiver perspectives about assistive technology. Infants Young Child. 2010;23(3):169-183. doi:10.1097/IYC.0b013e3181e1a873

23. Dugan LM, Campbell PH, Wilcox MJ. Making Decisions About Assistive Technology With Infants and Toddlers. Topics Early Child Spec Educ. 2006;26(1):25-32. doi:10.1177/02711214060260010301

24. Wilcox MJ, Guimond A, Campbell PH, Weintraub Moore H. Provider Perspectives on the Use of Assistive Technology for Infants and Toddlers With Disabilities. Topics Early Child Spec Educ. 2006;26(1):33-49. doi:10.1177/02711214060260010401

25. Arps K, Darr N, Katz J. Effect of adapted motorized ride-on toy use on developmental skills, quality of life, and driving competency in nonambulatory children age 9–60 months. Assist Technol. 2021;00(00):1-11. doi:10.1080/10400435.2021.1956643

26. Hilberink SR, Roebroeck ME, Nieuwstraten W, Jalink L, Verheijden JM a, Stam HJ. Health issues in young adults with cerebral palsy: towards a life-span perspective. J Rehabil Med. 2007;39(8):605-611. doi:10.2340/16501977-0103

27. Moore L, Koger D, Blomberg S, et al. Making best practice our practice: Reflections on our journey into natural environments. Infants Young Child. 2012;25(1):95-105. doi:10.1097/IYC.0b013e31823d0592

28. Butler, C., Okamoto M. Powered mobility for very young disable children. Dev Child Neurol. Published online 1983.

29. Tefft D; Guerette, P., Furumasu J. Cognitive predictors of young children ' s readiness for powered mobility. 1999;(Colangelo 1994):665-670.

30. Furumasu J, Guerette P, Tefft D. Relevance of the Pediatric Powered Wheelchair Screening Test for children with cerebral palsy. Dev Med Child Neurol. 2004;46(7):468-474. http://www.ncbi.nlm.nih.gov/pubmed/15230460

31. Lynch A, Ryu J-C, Agrawal S, Galloway JC. Power mobility training for a 7-month-old infant with spina bifida. Pediatr Phys Ther. 2009;21(4):362-368. doi:10.1097/PEP.0b013e3181bfae4c

32. Rosen L, Plummer T, Sabet A, Lange ML, Livingstone R. RESNA position on the application of power mobility devices for pediatric users. Assist Technol. Published online 2018. doi:10.1080/10400435.2017.1415575

33. Livingstone R, Field D. Systematic review of power mobility outcomes for infants, children and adolescents with mobility limitations. Clin Rehabil. Published online 2014. doi:10.1177/0269215514531262

34. Rosen L, Arva J, Furumasu J, et al. RESNA position on the application of power wheelchairs for pediatric users. Assist Technol. 2009;21(4). doi:10.1080/10400430903246076

35. Plummer T, Logan SW, Morress C. Explorer Mini: Infants' Initial Experience with a Novel Pediatric Powered Mobility Device. Phys Occup Ther Pediatr. Published online 2020. doi:10.1080/01942638.2020.1819935

36. Anderson DI, Campos JJ, Witherington DC, et al. The role of locomotion in psychological development. Front Psychol. 2013;4(JUL). doi:10.3389/fpsyg.2013.00440

37. Bornstein MH, Hahn C-S, Suwalsky JTD. Physically developed and exploratory young infants contribute to their own long-term academic achievement. Psychol Sci. 2013;24(10):1906-1917. doi:10.1177/0956797613479974

38. Jones MA, McEwen IR, Neas BR. Effects of power wheelchairs on the development and function of young children with severe motor impairments. Pediatr Phys Ther. 2012;24(2):131-140. doi:10.1097/PEP.0b013e31824c5fdc

39. Feldner HA, Logan SW, Galloway JC. Why the time is right for a radical paradigm shift in early powered mobility: The role of powered mobility technology devices, policy and stakeholders. Disabil Rehabil Assist Technol. 2016;11(2):89-102. doi:10.3109/17483107.2015.1079651

40. Ragonesi CB, Galloway JC. Short-term, early intensive power mobility training: case report of an infant at risk for cerebral palsy. Pediatr Phys Ther. 2012;24(2):141-148. doi:10.1097/PEP.0b013e31824c764b

41. Butler, C., Okamato, G.A., McKay TM. Motorized wheelchair driving by disabled children. Arch Phys Med Rehabil. 1984;(65):95-97.

42. Gefen N. Who sets the goals in pediatric rehabilitation? Dev Med Child Neurol. 2020;62(4):410. doi:10.1111/dmcn.14475

43. Janeschild M. Pediatric Powered Mobility: Developmental Perspctive, Technical Issues, Clinical Approaches Early Power Mobility: Evaluation and Training Gudielines. (Furamasu J, ed.). RESNA Press; 1997.

44. Furamasu, J., Guerette, P., Tefft D. The development of a powered mobility wheelchair mobility program for young children. Technol Disabil. 1996;5:41-48.

45. Furumasu J, Guerette P, Tefft D. Relevance of the Pediatric Powered Wheelchair Screening Test for children with cerebral palsy. Dev Med Child Neurol. 2004;46(7):468-474. doi:10.1017/s0012162204000775

46. Butler, Okamoto M. Butler, Okamoto, McKay - 1983 - Powered mobility for very young disabled children. Dev Med Child Neurol. 1983;25:472-474.

47. Field DA, Livingstone RW. Power mobility skill progression for children and adolescents: a systematic review of measures and their clinical application. Dev Med Child Neurol. 2018;60(10):997-1011. doi:10.1111/dmcn.13709

48. Nilsson L, Durkin J. Powered mobility intervention: understanding the position of tool use learning as part of implementing the ALP tool. Disabil Rehabil Assist Technol. 2017;12(7):730-739. doi:10.1080/17483107.2016.1253119

49. Durkin J. Discovering powered mobility skills with children ,responsive partners ' in learning. Int J Ther Rehabil. 2009;16gefen:331-341.

50. Kenyon LK, Hostnik L, McElroy R, Peterson C, Farris JP. Power Mobility Training Methods for Children: A Systematic Review. Pediatr Phys Ther. 2018;30(1):2-8. doi:10.1097/PEP.0000000000000458

51. Campos JJ, Anderson DI, Barbu-Roth MA, Hubbard EM, Hertenstein MJ, Witherington D. Travel Broadens the Mind.; 2000. http://www.infancyarchives.com.

52. Lefèvre C. Posture, Muscular Tone and Visual Attention in 5 Month-Old Infants. Infant Child Dev. 2002;11(4):335-346. doi:10.1002/icd.262

53. Rachwani J, Herzberg O, Golenia L, Adolph KE. Postural, Visual, and Manual Coordination in the Development of Prehension. Child Dev. 2019;90(5):1559-1568. doi:10.1111/cdev.13282

54. Saavedra S, Woollacott M, Donkelaar P Van. effect of vision and trunk support. 2011;201(1):1-19. doi:10.1007/s00221-009-2001-4.Head

55. Hadders-Algra M. Typical and atypical development of reaching and postural control in infancy. Dev Med Child Neurol. 2013;55(SUPPL.4):5-8. doi:10.1111/dmcn.12298

56. Westcott SL, Burtner P a. Postural control in children: implications for pediatric practice. Phys Occup Ther Pediatr. 2004;24(1-2):5-55. http://www.ncbi.nlm.nih.gov/pubmed/15268997

57. Focaroli, V., & Iverson J. Children's Object Manipulation: A Tool Fopr Knowing Te External World and for Communjication Development. Springer; 2017.

58. Dietz, j., Swinth, Y., White O. Powered mobility and preschoolers with complex developmental delays. Am J Occup Ther. 2002;56:86-96.

59. Hadders-Algra M. Development of Postural Control During the First 18 Months of Life. Vol 12.; 2005.

60. Huhn K, Guarrera-Bowlby P, Deutsch JE. The clinical decision-making process of prescribing power mobility for a child with cerebral palsy. Pediatr Phys Ther. 2007;19(3):254-260. doi:10.1097/PEP.0b013e31812c65cc

61. Lynch A, Ryu JC, Agrawal S, Galloway JC. Power mobility training for a 7-month-old infant with spina bifida. Pediatr Phys Ther. 2009;21(4):362-368. doi:10.1097/PEP.0b013e3181bfae4c

62. Ragonesi CB, Chen X, Agrawal S, Galloway JC. Power mobility and socialization in preschool: Follow-up case study of a child with cerebral palsy. Pediatr Phys Ther. 2011;23(4):399-406. doi:10.1097/PEP.0b013e318235266a

63. Kenyon LK, Farris JP, Gallagher C, Hammond L, Webster LM, Aldrich NJ. Power Mobility Training for Young Children with Multiple, Severe Impairments: A Case Series. Phys Occup Ther Pediatr. 2017;37(1). doi:10.3109/01942638.2015.1108380

64. Durkin J. Partners ' in learning. Int J Ther Rehabil. 2009;16(6):331-342.

65. Jones MAz, McEwen IR, Neas BR. Effects of power wheelchairs on the development and function of young children with severe motor impairments. Pediatr Phys Ther. 2012;24(2):131-140; discussion 140. doi:10.1097/PEP.0b013e31824c5fdc

66. Iverson JM. Developing language in a developing body: The relationship between motor development and language development. J Child Lang. 2010;37(2):229-261. doi:10.1017/S0305000909990432

67. Benassi E, Savini S, Iverson JM, et al. Early communicative behaviors and their relationship to motor skills in extremely preterm infants. Res Dev Disabil. 2016;48:132-144. doi:10.1016/j.ridd.2015.10.017

68. Iverson JM, Thelen E. Hand, mouth and brain: The dynamic emergence of speech and gesture. J Conscious Stud. 1999;6(11-12):19-40.

69. Zukow-Goldring P. Assisted imitation: Affordances, effectiveness, and the mirrow system in early language development. In: Arbib M, University of Southern California, eds. From Action to Language. Cambridge; 2006:469-500.

70. National Academies of Sciences E and M. Speech and language disorders in children: Implications for Social Security Administration's Supplemental Security Income Program. National Academies Press. doi:10.17226/21872

71. Lobo MA, Harbourne RT, Dusing SC, McCoy SW. Grounding Early Intervention : Phys Ther. 2013;93(1):94-103.

72. Van Der Stuyf RR. Scaffolding as a Teaching Strategy. Strategy. Published online 2002:13. Retrieved from http://ateachingpath1.weebly.com/uploads/1/7/8/9/17892507/stuyf_2002.pdf

73. Taylor-Goh S. Royal College of Speech & Language Therapists Clinical Guidelines. R Coll Speech Lang Ther Clin Guidel. Published online 2017. doi:10.4324/9781315171548

74. Nelson NW. Be-Attitudes for managing change in school-based practice. The ASHA Leader.

75. Wilkinson KM, McIlvane WJ. Perceptual factors influence visual search for meaningful symbols in individuals with intellectual disabilities and Down syndrome or autism spectrum disorders. Am J Intellect Dev Disabil. 2013;118(5):353-364. doi:10.1352/1944-7558-118.5.353

76. Roberts MY, A.P. K. The effectiveness of parent-implemented language interventions: A meta-analysis. Am J Speech-Language Pathol. 2011;20(3):180-199. doi:10.1044/1058-0360(2011/10-0055)amounts

77. Shevell MI. Present conceptualization of early childhood neurodevelopmental disabilities. J Child Neurol. 2010;25(1):120-126. doi:10.1177/0883073809336122

78. Rossetti L. The Rossetti Infant-Toddler Language Scale: A Measurement of Communication and Interaction. LinguiSystems; 2006.

79. Rowland, C. (2004). Communication Matrix: Especially for parents. Retrieved from https://documents.nationaldb.org/products/Parent-Comm-Matrix-Final.pdf

80. Scanlon, K. (2006) Common First Words: Adapted from The Rosetti Infant Toddler Language Scale. Retrieved from http://www.mytoddlertalks.com

81. Rescorla L. The languiage development survey: A screening tool for delayed language in toddlers. J Speech Hear Disord. 1989;54(4):587-599. doi:10.1044/jshd.5404.587

82. Pepper, J. & W. Glossary of It Takes Two to Talk® Strategies. 2nd ed. The Hanen Centre; 2004. http://www.hanen.org/SiteAssets/_p02_My-Profile/PWA_ITTT/ITTT-glossary-participants.aspx

83. West KL, Iverson JM. Language learning is hands-on: Exploring links between infants' object manipulation and verbal input. Cogn Dev. 2017;43(May):190-200. doi:10.1016/j.cogdev.2017.05.004

84. Beukelman, D., Mirenda J. Augmentative and Alternatice Communication: Supporting Children and Adults with Complex Communication Needs. 4th ed. Brookes; 2013.

85. Casey J, Paleg G, Livingstone R. Facilitating child participation through power mobility. Br J Occup Ther. 2013;76(3):158-160. doi:10.4276/030802213X13627524435306

86. Furumasu, Guerette, Tefft - 1996 - The development of a powered wheelchair mobility program for young children.pdf.

87. Livingstone R, Paleg G. Practice considerations for the introduction and use of power mobility for children. Dev Med Child Neurol. Published online September 3, 2013. doi:10.1111/dmcn.12245

88. Center for Disease Control and Prevention. Guidance for COVID-19 Prevention in K-12 Schools. Published 2021. cdc.gov/coronavirus/2019-ncov/community/schools-childcare/k-12-guidance.html

89. Waldman-Levi A, Erez ABH. Will environmental interventions affect the level of mastery motivation among children with disabilities? A preliminary study. Occup Ther Int. 2015;22(1):19-27. doi:10.1002/oti.1380

90. Livingstone R. Power mobility for infants and preschool children. Published online 2011.

91. Nilsson L, Nyberg P, Eklund M. Training characteristics important for growing consciousness of joystick-use in people with profound cognitive disabilities. 2010;17(11).

92. Lobo M a, Harbourne RT, Dusing SC, McCoy SW. Grounding early intervention: physical therapy cannot just be about motor skills anymore. Phys Ther. 2013;93(1):94-103. doi:10.2522/ptj.20120158

93. Soska KC, Adolph KE. Postural Position Constrains Multimodal Object Exploration in Infants. Infancy. 2014;19(2):138-161. doi:10.1111/infa.12039

94. Huang H han, Huang HW, Chen YM, Hsieh YH, Shih MK, Chen CL. Modified ride-on cars and mastery motivation in young children with disabilities: Effects of environmental modifications. Res Dev Disabil. 2018;83(February):37-46. doi:10.1016/j.ridd.2018.08.001

95. Westby C. A Scale for Assessing Children's Play. (K. Gitlin-Weiner AS& CS, ed.). John Wiley & Sons, Inc; 200AD.

96. Brenna B, Myburgh Shannon Aubichon Alexandra Baker Raelyn Fee J-E. Exploring the Use of Interest Inventories with Elementary Students: A Rich Foundation for Literacy Curriculum Making. Vol 39.; 2017.

97. Swanson J, Raab MR, Dunst CJ. CASE t o o l s. 2006;2(5).

98. CDC. Center for Disease Control and Prevention. CDC Developmental milestones.

99. Stahl AE, Feigenson L. Observing the unexpected enhances infants' learning and exploration. Science (80-). 2015;348(6230):91-94. doi:10.1126/science.aaa3799

100. Fernald A, Simon T. Expanded Intonation Contours in Mothers' Speech to Newborns. Vol 20.; 1984.

101. Masur EF, Olson J. Mothers' and infants' responses to their partners' spontaneous action and vocal/verbal imitation. Infant Behav Dev. 2008;31(4):704-715. doi:10.1016/j.infbeh.2008.04.005

102. Matatyaho-Bullaro DJ, Gogate L, Mason Z, Cadavid S, Abdel-Mottaleb M. Type of object motion facilitates word mapping by preverbal infants. J Exp Child Psychol. 2014;118(1):27-40. doi:10.1016/j.jecp.2013.09.010

103. Brand RJ, Baldwin DA, Ashburn LA. Evidence for "motionese": Modifications in mothers' infant-directed action. Dev Sci. 2002;5(1):72-83. doi:10.1111/1467-7687.00211

104. Gogate LJ, Bahrick LE, Watson JD. A Study of Multimodal Motherese : The Role of Temporal Synchrony between Verbal Labels and Gestures Published by : Wiley on behalf of the Society for Research in Child Development Stable URL : http://www.jstor.org/stable/1132332 REFERENCES Linked referenc. Child Dev. 2000;71(4):878-894.

105. Goodwyn SW, Acredolo LP, Brown CA. Impact of symbolic gesturing on early language development. J Nonverbal Behav. 2000;24(2):81-103. doi:10.1023/A:1006653828895

106. Fagan MK, Iverson JM. The Influence of Mouthing on Infant Vocalization. Vol 11.; 2007.

107. Iverson JM, Fagan MK. Infant Vocal-Motor Coordination: Precursor to the Gesture-Speech System? Child Dev. 2004;75(4):1053-1066.

108. Karasik LB, Tamis-Lemonda CS, Adolph KE. Crawling and walking infants elicit different verbal responses from mothers. Dev Sci. 2014;17(3):388-395. doi:10.1111/desc.12129

109. Coté CA. Haptic exploration in elementary school age children. OTJR Occup Particip Heal. 2014;34(1):4-10. doi:10.3928/15394492-20131029-05

110. Soska KC, Adolph KE, Johnson SP. Systems in Development: Motor Skill Acquisition Facilitates Three-Dimensional Object Completion. Dev Psychol. 2010;46(1):129-138. doi:10.1037/a0014618

111. Zosh, J.M., Hopkins, E.J., Jensen, H., Liu, C., Neale, D., Hirsh-Pasek, K., Solis, S.L. & Whitebread D. Learning through Play: A Review of the Evidence.; 2017.

112. Deitz J, Swinth Y, White O. Complex Developmental Delays. Am J Occup Ther. 2002;56(1):86-96.

113. Lefevre C. Posture , Muscular Tone and Visual Attention in 5 Month-Old Infants. 2002;346:335-346. doi:10.1002/icd.

114. Parham, D.L. & Fazio SL. Play in Occupational Therapy for Children. Mosby Elsevier; 2008.

115. Reilly M. Play as Exploratory Learning: Studies of Curiosity Behavior. SAGE Publications Inc.; 1974.

116. Rachwani J, Santamaria V, Saavedra SL, Woollacott MH. The development of trunk control and its relation to reaching in infancy: A longitudinal study. Front Hum Neurosci. 2015;9(FEB):1-12. doi:10.3389/fnhum.2015.00094

117. Nilsson L, Eklund M, Nyberg P. Driving to Learn in a powered wheelchair: Inter-rater reliability of a tool for assessment of joystick-use. Aust Occup Ther J. 2011;58(6):447-454. doi:10.1111/j.1440-1630.2011.00983.x

118. Dauch C, Imwalle M, Ocasio B, Metz AE. The influence of the number of toys in the environment on toddlers' play. Infant Behav Dev. 2018;50:78-87. doi:10.1016/j.infbeh.2017.11.005

119. Als H, Duffy FH, McAnulty GB, et al. Early Experience Alters Brain Function and Structure. Pediatrics. 2004;113(4):846-857. doi:10.1542/peds.113.4.846

120. Duffy, M.A., Huebner, K.M., & Wormsley DP. Acitivities of daily living and individuals with low vision. In: M. Sheiman, ed. Understanding and Managing Vision Deficits: A Guide for Occupational Therapist. ; 2011:301-319.

121. Smith A. Noise and aspects of attention. Br J Psychol. 1991;82:313-324.

122. Frank MC, Vul E, Saxe R. Measuring the Development of Social Attention Using Free-Viewing. Infancy. 2012;17(4):355-375. doi:10.1111/j.1532-7078.2011.00086.x

123. Meriano, L. Say What? Alternative and Augmentative Communication Blog https://www.dsrf.org/blog/say-what--augmentative-and-alternative-communication

124. Kenyon LK, Farris J, Brockway K, Hannum N, Proctor K. Promoting Self-exploration and Function Through an Individualized Power Mobility Training Program. Pediatr Phys Ther. 2015;27(2):200-206. doi:10.1097/PEP.0000000000000129

125. Fullerton KE, Conroy MA, Correa VI. Early childhood teachers' use of specific praise statements with young children at risk for behavioral disorders. Behav Disord. 2009;34(3):118-135. doi:10.1177/019874290903400302

126. Gunderson, E., Gripshover, S., Romero, C., Dweck, C., Goldin-Meadow, m S., & Levine SC. Parent Praise to 1-3 year-olds predicts children's motivational frameworks 5 years later. Child Dev. 2013;84(5):1526-1541. doi:10.1111/cdev.12064

127. Price E. Office of Child Development. Published online 1975:12. http://search.proquest.com/docview/64060560?accountid=13042

128. Deichmann F, Ahnert L. The terrible twos: How children cope with frustration and tantrums and the effect of maternal and paternal behaviors. Infancy. 2021;26(3):469-493. doi:10.1111/infa.12389

129. Durham K, Vliet PMVAN. Use of information feedback and attentional focus of feedback in treating the person with a hemiplegic arm. 2009;14(December 2008):77-90. doi:10.1002/pri

130. Bigras C, Kairy D, Archambault PS. Augmented feedback for powered wheelchair training in a virtual environment. J Neuroeng Rehabil. 2019;16(1):1-12. doi:10.1186/s12984-019-0482-3

131. Laus, M., Danko, C., Lawry, J., Strain, P.S., & Smith BJ. Following directions: Suggestions for facilitating success. Young Except Child. 1999;2(4):2-8. doi:10.1177/109625069900200401

132. Walker, D., Small, C., Bigelow, K., Kirk, S, Harjusola-Webb & Mark N. Strategies for promoting communication and language of infants and toddlers. Juniper Garden's Children's Project University of Kansas.

133. Galloway JC, Ryu JC, Agrawal SK. Babies driving robots: Self-generated mobility in very young infants. Intell Serv Robot. 2008;1(2):123-134. doi:10.1007/s11370-007-0011-2

134. Wu R, Kirkham NZ. No two cues are alike: Depth of learning during infancy is dependent on what orients attention. J Exp Child Psychol. 2010;107(2):118-136. doi:10.1016/j.jecp.2010.04.014

135. Grady-Dominguez P, Ragen J, Sterman J, et al. Expectations and assumptions: Examining the influence of staff culture on a novel school-based intervention to enable risky play for children with disabilities. Int J Environ Res Public Health. 2021;18(3):1-20. doi:10.3390/ijerph18031008

136. Brussoni M, Gibbons R, Gray C, et al. What Is the Relationship between Risky Outdoor Play and Health in Children? A Systematic Review. Vol 12.; 2015. doi:10.3390/ijerph120606423

137. Barton EE. Development of a Taxonomy of Pretend Play for Children With Disabilities. Vol 23.; 2010.

138. Yogman M, Garner A, Hutchinson J, et al. The power of play: A pediatric role in enhancing development in young children. Pediatrics. 2018;142(3). doi:10.1542/peds.2018-2058

Appendix 1

COMMON FIRST WORDS

The following is a list of common first words adapted from *The Rossetti Infant Toddler Language Scale (2006)* and from the research findings of Professor Leslie Altman Rescorla, the director of the Child Study Institute at Bryn Mawr College.

ADJECTIVES *(Describing Words):*

- ❑ Big
- ❑ Cold
- ❑ Dirty
- ❑ Hot
- ❑ Little
- ❑ Old
- ❑ Thirsty
- ❑ Tired
- ❑ Wet
- ❑ Yucky

EARLY PRONOUNS:

- ❑ I
- ❑ Me
- ❑ Mine
- ❑ You

PREPOSITIONS

(or Early Location Words):

- ❑ Down
- ❑ Here
- ❑ In
- ❑ On
- ❑ Out
- ❑ There
- ❑ Up

NOUNS *(Person, Place, or Thing):*

- ❑ Apple
- ❑ Arms
- ❑ Baby
- ❑ Ball
- ❑ Balloon
- ❑ Banana
- ❑ Bath
- ❑ Bear/Teddy
- ❑ Belly/Tummy
- ❑ Bike
- ❑ Bird
- ❑ Book
- ❑ Boots
- ❑ Boy
- ❑ Bug
- ❑ Bunny
- ❑ Candy
- ❑ Car
- ❑ Cat/Kitty
- ❑ Chair
- ❑ Cheese
- ❑ Choo-choo
- ❑ Church
- ❑ Clock
- ❑ Coat
- ❑ Comb
- ❑ Cookie
- ❑ Cracker
- ❑ Cup
- ❑ Dada/Daddy
- ❑ Diaper
- ❑ Dog/Doggie
- ❑ Drink
- ❑ Ears
- ❑ Eyes
- ❑ Feet
- ❑ Fingers
- ❑ Flowers
- ❑ Girl
- ❑ Grandma
- ❑ Grandpa
- ❑ Gum
- ❑ Hair
- ❑ Hands
- ❑ Hat
- ❑ Horse/Horsey
- ❑ Hot dog
- ❑ Juice
- ❑ Key
- ❑ Legs
- ❑ Mama/Mommy
- ❑ Milk
- ❑ Mouth
- ❑ Nose
- ❑ Paper
- ❑ Phone
- ❑ Pizza
- ❑ Potty
- ❑ Purse
- ❑ Rock
- ❑ Shirt
- ❑ Shoe
- ❑ Sky
- ❑ Sleep
- ❑ Snow
- ❑ Sock
- ❑ Spoon
- ❑ Stick
- ❑ Stove
- ❑ Teeth
- ❑ Toes
- ❑ Toy
- ❑ Truck
- ❑ TV

SOCIAL WORDS:

- ❑ Bye/Bye-bye
- ❑ Hi/Hello
- ❑ Huh?
- ❑ More
- ❑ Shhh
- ❑ Thank you
- ❑ Uh-oh
- ❑ What?
- ❑ What's that?
- ❑ Yes/Yeah

VERBS *(Action Words):*

- ❑ Comb
- ❑ Done
- ❑ Drink
- ❑ Eat
- ❑ Fall
- ❑ Go
- ❑ Go bed
- ❑ Go bye-bye
- ❑ Go night-night
- ❑ Go out
- ❑ Put
- ❑ See
- ❑ Sit
- ❑ Sleep
- ❑ Snow
- ❑ Swing
- ❑ Want

ADDITIONAL TYPES

(These may include Quantity, Animal Sounds, and Rejection):

- ❑ All (all gone)
- ❑ Done (all done)
- ❑ Don't
- ❑ Neigh-neigh
- ❑ No
- ❑ Moo
- ❑ Quack-quack

If your child is not yet using some of these words, try targeting a few when participating in the play routines presented in the book, *My Toddler Talks: Strategies and Activities to Promote Your Child's Language.* Or, read *My Toddler's First Words: A Step-By-Step Guide to Jump-Start, Track, and Expand Your Toddler's Language* to learn how to strategically facilitate your toddler's first words.

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Appendix 2

Revised Concise Symbolic Play Scale (Westby, 2000)

<table>
<tr><th>Ages</th><th>Theory of Mind</th><th colspan="2">(Episodic Memory)
Content Themes | Organization</th><th>Decontextualization</th></tr>
<tr><td>17-19 mo</td><td>pretend play on self</td><td>events personally experienced that happen daily</td><td>single activities</td><td rowspan="6">realistic props</td></tr>
<tr><td>19-22 mo</td><td>pretends on doll (doll passive recepient)</td><td rowspan="2">caregiver activities</td><td rowspan="3">combines 2 toys or performs actions on 2 people
several actions on a theme (doll in tub, wash, dry)</td></tr>
<tr><td>2 yr</td><td rowspan="3">talks to doll</td></tr>
<tr><td>2 ½ yr</td><td rowspan="2">events personally experienced that happen periodcally (associated with emotion)</td></tr>
<tr><td>3 yr</td><td rowspan="3">events child has seen or read about but not personally experienced</td><td>short sequences of temporally-related activities; events evolve</td><td>low representation toys; object substitutions</td></tr>
<tr><td>3-3 ½ yr</td><td>gives voice to dolls/puppets</td><td rowspan="2">planned events with cause-effect sequences</td><td rowspan="2">language used to set scene</td></tr>
<tr><td>4 yr</td><td rowspan="2">gives characters multiple roles (mother, wife, doctor)</td></tr>
<tr><td>5-6 yr</td><td>highly imaginative themes</td><td>multiple planned sequences</td></tr>
</table>

Table 1: Developmental Playscale

Phase 1: Presymbolic

PLAY			COMMUNICATION
Object Permanence	**Means-End/Problem Solving**	**Object Use**	
Presymbolic Level I: 8 to 12 months ☐ Aware that objects exist when not seen; finds toy hidden under cloth, box, etc., associates object with location	☐ Attains toy by pulling cloth on which toy is resting ☐ Attains toy by pulling string ☐ Touches adult to continue activity	☐ Explores moveable parts of toy ☐ Does not mouth all toys. Uses several different schemes (patting, banging, turning, throwing, etc.); uses some differential schemas on familiar objects	☐ Joint attention on toy and person ☐ No true language; may have performative words that are associated with action or the total situation ☐ Shows and gives objects Exhibits the following communicative intents: ☐ Request (instrumental) ☐ Command (regulatory)
Presymbolic II: 13 to 17 months ☐ Aware that objects exist separate from location; finds objects hidden in first one place and then in a second or third location	☐ Understands "in-ness;" dumps objects out of bottle ☐ Hands toy to adult if unable to operate ☐ Hands toy to adult to get attention ☐ Uses index finger to point to desired object	☐ Recognizes operating parts of toys (attends to knobs, levers, buttons) ☐ Discovers operations of toys through trial and error ☐ Construction of toy relationships (e.g, puts one toy in another such as figure in car; nests boxes) ☐ Uses familiar objects appropriately	☐ Context dependent single words, e.g., child may use the word "car" when riding in a car, but not when he sees a car; words tend to come and go in child's vocabulary Exhibits the following communicative functions: ☐ Request ☐ Protest ☐ Command ☐ Label ☐ Interactional ☐ Response ☐ Personal ☐ Greeting

Summary of Symbolic Playscale

AGE	PROPS	THEMES	ORGANIZATION	ROLES	LANGUAGE USED IN PLAY
by 18 months	uses one realistic object at a time	familiar everyday activities in which child is active participant (e.g., eating, sleeping)	short, isolated pretend actions	autosymbolic pretend, (e.g., child feeds self pretend food	language used to get and maintain toys and seek assistance operating toys (e.g., "baby," "mine," "help")
by 22 months	uses two realistic objects at a time	familiar everyday activities that caregivers do (e.g., cooking, reading)	combines two related toys or performs actions on two people (e.g., uses spoon to eat from plate; feeds mother, then doll)	child acts on dolls and others (e.g., feeds doll or caregiver)	uses word combinations to comment on toy or action; uses word for intents, needs, feelings ("want that," "mad," "hungry")
by 24 months	uses several realistic objects		multischeme combinations of steps (e.g., put doll in tub, apply soap, take doll out and dry)		talks to doll briefly; describes some of the doll's actions (e.g., "baby sleeping"); uses phrases and markers for ing and plurals/possessives
by 30 months		common but less frequently experienced or especially traumatic experiences (e.g., shopping, doctor)		emerging limited doll actions (e.g., doll cries)	talking to doll and commenting on doll's actions increase in frequency; uses
by 3 years		observed, but not personally experienced activities (e.g., police, firefighter); compensatory play-- Re-enacts experienced events, but modifies original outcomes	temporal sequences of multischeme events (e.g., prepare food, set table, eat food, clear table, wash dishes)	child talks to doll in response to doll's actions (e.g., "don't cry now," "I'll get you a cookie."); brief complementary role play with peers (e.g., mother and child; doctor and patient)	use complete sentences with past tense and future aspect; children may comment on what they have just completed or what they will do next (e.g., "Dolly ate the cake." "I'm gonna wash dishes.")
by 3 1/2 years	miniature props, small figures, and object substitutions			attributes emotions and desires to dolls; reciprocal role taking with dolls (child treats doll as partner--talks for doll and as caregiver)	use dialogue for dolls and metalinguistic markers (e.g., "he said"); use words to refer to emotions and thoughts
by 4 years	imaginary props (language and gesture help set the scene)	familiar fantasy themes (e.g., Batman, Wonder Woman, Cinderella, etc.); violent themes common	planned play events with cause-effect sequences (e.g., child decides to play a birthday party and gathers necessary props and assigns roles)	child or doll has multiple roles (mother, wife, doctor; firefighter, husband, father) child can handle two or more dolls in complementary rolls (dolls are doctor and patient) attributes thoughts and plans to doll	use language to plan and narrate the story line; use of connecting words so, because, but-effect
by 6 years	language and gesture can carry the play without props	create novel fantasy characters and plots	multiple planned sequences (plans for self and other players)	more than one role per doll (doll is mother, wife, doctor)	elaboration of planning and narrative story line; uses sentences with temporal markers, then, when, while, before, first, next

Phase 2: Symbolic

PLAY				LANGUAGE	
Decontextualization **What props are used in pretend play?**	**Thematic Content** **What schemas/scripts does the child represent?**	**Organization** **How coherent and logical are the child's schemas/scripts?**	**Self/Other Relations** **What roles does the child take and give to toys and other people?**	**Function**	**Form and Content**
Symbolic level I: 17-19 months Child exhibits internal mental representation ☐ Tool-use (uses stick to reach toy) ☐ Finds toy invisibly hidden (when placed in a box and box emptied under scarf) ☐ Pretends using life-like props ☐ Does not stack solid ring	☐ Familiar, everyday activities (eating, sleeping) in which child has been an active participant	☐ Short isolated schemas (single pretend actions)	☐ Self as agent (auto-symbolic or self-representational play, i.e., child pretends to go to sleep, to eat from a spoon, or to drink from an empty cup)	Directing ☐ Requesting ☐ Commanding ☐ Interactional Self-maintaining ☐ Protesting ☐ Protecting self and self interests Commenting ☐ Labeling (objects and activity) ☐ Indicating personal feeling	Beginning of true verbal communication. Words have following functional and semantic relations: ☐ Recurrence ☐ Existence ☐ Nonexistence ☐ Rejection ☐ Denial ☐ Agent ☐ Object ☐ Action or state ☐ Object or person associated with object or person
Symbolic Level II: 19-22 months	☐ Activities of familiar others (cooking, reading, cleaning, shaving)	☐ Short, isolated schema combinations (child combines two actions or toys in pretend, e.g., rocking doll and putting it to bed; pouring from pitcher into cup, or feeding doll from plate with spoon)	☐ Child acts on doll (Doll is passive recipient of action); brushes doll's hair, covers doll with blanket ☐ Child performs pretend actions on more than one object or person, e.g., feeds self, a doll, mother, or another child	☐ Refers to objects and persons not present ☐ Requests information	Beginning of word combinations with following semantic relations: ☐ Agent-Action ☐ Action-object ☐ Agent-object ☐ Attributive ☐ Dative ☐ Action-locative ☐ Possessive
Symbolic Level III: 2 years		☐ Elaborated single schemas (represents daily experiences with details, e.g., puts lid on pan, puts pan on stove; collects items associated with cooking/ eating such as dishes, pans, silverware, glasses, highchair	☐ Reverses roles--"I'll play you and you play me."	☐ Comments on activity of self (get apple) ☐ Comments on doll (baby sleep)	☐ Uses phrases and short sentences Appearance of morphological markers: ☐ Present progressive (ing) on verbs ☐ Plurals ☐ Possessives

PLAY				LANGUAGE	
Decontextualization **What props are used in pretend play?**	**Thematic Content** **What schemas/scripts does the child represent?**	**Organization** **How coherent and logical are the child's schemas/scripts?**	**Self/Other Relations** **What roles does the child take and give to toys and other people?**	**Function**	**Form and Content**
Symbolic Level IV: 2 1/2 years	Represents less frequently personally experienced events, particularly those that are memorable because they are pleasurable or traumatic: ☐ Store shopping ☐ Doctor-nurse-sick child		☐ Talks to doll ☐ Reverses dyadic/ complementary roles ("I'll play x and you play y."), e.g. doctor/ patient; shopper/cashier		Responds appropriately to the following WH questions in context: ☐ What ☐ Who ☐ Whose ☐ Where ☐ What...do ☐ Asks WH question (generally puts WH at beginning of sentence) ☐ Responses to why questions inappropriate except for well-known routines ☐ Asks why, but often inappropriate and does not attend to answer
Symbolic Level V: 3 Years	☐ Compensatory play: Re-enacts experienced events, but modifies original outcomes	☐ Evolving episode sequences, e.g., child mixes cake, bakes it, washes dishes; or doctor checks patient, calls ambulance, takes patient to hospital (sequence not planned)	☐ Transforms self into role ☐ Engages in associative play, i.e., children do similar activities, may share same role, but no organized goal	☐ Reporting ☐ Predicting ☐ Emerging narrating or story-telling	☐ Uses past tense, such as, "I ate the cake," "I walked" ☐ Uses future aspect (particularly "gonna") forms, such as "I'm gonna wash dishes."
Symbolic Level VI: 3 to 3 1/2 Years ☐ Carries out pretend activities with replica toys (Fisher Price/ Playmobil dollhouse, barn, garage, village, airport) ☐ Uses one object to represent another (Stick can be a comb, chair can be a car) ☐ Uses blocks and sandbox for imaginative play. Blocks used as enclosures (fences, houses) for animals and dolls	☐ Represents observed events, i.e., events in which child was not an active participant (policemen, firemen, war, cowboys, schemas/scripts from TV shows -- Batman, Ninja Turtles, Power Rangers		☐ Child assigns roles to other children; negotiates play ☐ Multiple reversible roles ("I'll be a and b and you be x"), e.g., child is ticket seller, pilot, and airline steward, but co-player is always passenger Uses doll or puppet as participant in play: ☐ Child talks for doll ☐ Reciprocal role taking--child talks for doll and as parent of doll	☐ Projecting: gives desires, thoughts, feelings, to doll or puppet ☐ Uses indirect requests, e.g., "mommy lets me have cookies for breakfast." ☐ Changes speech depending on listener ☐ Reasoning (integrates reporting, predicting, projecting information) ☐ Metacommunicative strategies	Descriptive vocabulary expands as child becomes more aware of perceptual attributes; uses terms for following concepts (not always correctly): ☐ shapes ☐ sizes ☐ colors ☐ textures ☐ spatial relations ☐ Uses metalinguistic and metacognitive language, e.g., "He said...;" I know...."
Symbolic Level VII: 3 1/2 to 4 Years ☐ Uses language to invent props and set scene ☐ Builds 3-dimensional structures with blocks	☐ Improvisations and variations on themes	☐ Schemas/scripts are planned ☐ Hypothesizes "what would happen if/"	☐ Uses dolls and puppets to act out schemas/scripts ☐ Child or doll has multiple roles (e.g., mother and wife; fireman, husband, father)	☐ Uses language to take roles of character in the play, stage manager for the props, or as author of the play story	☐ Uses modals (can, could, may, might, would) ☐ Uses conjunctions (and, but, so, because, if) NOTE: Full competence for modals and conjunctions does not develop until 10-12 years of age. ☐ Some appropriate responses to why and how questions requiring reasoning

PLAY				LANGUAGE	
Decontextualization **What props are used in pretend play?**	**Thematic Content** **What schemas/scripts does the child represent?**	**Organization** **How coherent and logical are the child's schemas/scripts?**	**Self/Other Relations** **What roles does the child take and give to toys and other people?**	**Function**	**Form and Content**
Symbolic Level VIII: 5 years					
☐ Can use language to set the scene, actions, and roles in play	☐ Highly imaginative activities that integrate parts of known schemas/scripts for events child has never participated in or observed (e.g., astronaut builds ship, flies to strange planet, explores, eats unusual food, talks with creatures on planet)	☐ Plans several sequences of pretend events. Organizes what is needed -- both objects and other children. Coordinates several scripts occurring simultaneously	☐ Engages in collaborative play, i.e., play roles coordinated and themes are goal-directed		☐ Uses relational terms (then, when, first, last, next, while, before, after) Note: Full competence does not develop until 10-12 years of age.

Main Reference:
Westby, C.E. (2000). **A scale for assessing development of children's play**. In K Gitlin-Weiner, A. Sandgrund , & C. Schaefer (Eds.), *Play diagnosis and assessment.* New York: Wiley.

Books for Facilitation of Play

Barbour, A., & Desjean-Perrotta, B. (2002). *Prop box: 50 themes to inspire dramatic play*. Beltsville, MD: Gryphon House.
Campbell, K.J. (2003). *Art across the alphabet: Over 100 art experiences that enrich early literacy*. Beltsville, MD: Gryphon House
MacDonald, S. (2001). *Block play*: *The complete guide to learning and playing with blocks.* Beltsville, MD: Gryphon House.
West, S., & Cox, A. (2004). *Literacy play: Over 300 dramatic play activities that teach pre-reading skills*. Beltsville, MD: Gryphon House.
Wiggins, A.K. (2006). *Preschoolers at play: Building language and literacy through dramatic play.* Greenville, SC: Super Duper.
Wolfberg, P.J. (2003). *Peer play and the autism spectrum: The art of guiding children's socialization and imagination*. Shawnee Mission, KS: Autism Asperger Publishing. (This book is specific for children with autism – ways to evaluate play and how to structure and scaffold play for children with autism).

Professional Books/Articles

Johnson, J.E., Christie, J.F., & Yawkey, T.D. (1999). *Play and early childhood development*. New York: Longman.
Roskos, K.A., & Christie, J.F. (2007). *Play and literacy in early childhood: Research from multiple perspectives*. New York: Taylor & Francis.
Singer, D.G., Golinkoff, R.M., & Hirsh-Pasek, K. (2006). *Play=learning.* New York: Oxford University Press. (http://udel.edu/~roberta/play/)
Paley, V.G. (2005). *Child's work: The importance of fantasy play*. Chicago, IL: University of Chicago Press.
Zigler, E.F., Singer, D.G., & Bishof-Josef, S.J. (2004). *Children's play: The roots of reading.* Washington, DC: Zero to Three

Appendix 3

CASEtools
Instruments and Procedures for Implementing Early Childhood and Family Support Practices

Promoting Young Children's Participation in Interest-Based Everyday Learning Activities

Jennifer Swanson
Melinda R. Raab
Nicole Roper
Carl J. Dunst

This *CASEtool* includes a description of the development and use of three *Interest-Based Everyday Activity Checklists,* one for children birth to 15 months of age, one for children 15 to 36 months of age, and one for children 36 to 60 months of age. The assessment/intervention tools are used as part of a parent-mediated approach to early childhood intervention called *Contextually Mediated Practices* or *CMP*. The checklists are used to identify interest-based child learning opportunities occurring as part of everyday family and community life and to increase child participation in the activities. Guidelines for implementing *CMP* are included.

INTRODUCTION

The purpose of this *CASEtool* is to describe the development and use of procedures for promoting infant, toddler, and preschooler interest-based participation and learning in everyday family and community activities (Raab, 2005). The paper includes three checklists of activities for identifying interest-based everyday learning opportunities for infants (birth to 15 months), toddlers (15 months to 36 months), and preschoolers (36 months to 60 months) respectively. The checklists are used as part of a parent-mediated approach to early childhood intervention called *Contextually-Mediated Practices*™ or *CMP*™ (Dunst, 2006). *CMP* uses everyday family and community activities as sources of child learning opportunities and child interests as the basis for parent-mediated child participation and learning in those activities. The next section of the paper includes an overview of *CMP*. The reader is referred to Dunst (2006), Raab (2005), and Raab and Dunst (2006a) for additional information about this approach to early childhood intervention.

CONTEXTUALLY MEDIATED PRACTICES

Figure 1 shows the major components of the *CMP* model. The components include: (a) the everyday activities making up children's family and community lives, (b) children's interests and assets for promoting participation and learning in everyday activities, (c) increased opportunities for practicing existing abilities and learning new competencies, and (d) parent's mediation of children's interest-based everyday learning.

NOTE: Contextually Mediated Practices ™ and CMP™ are trademarks for the early intervention practices described in this paper and may not be used without permission.

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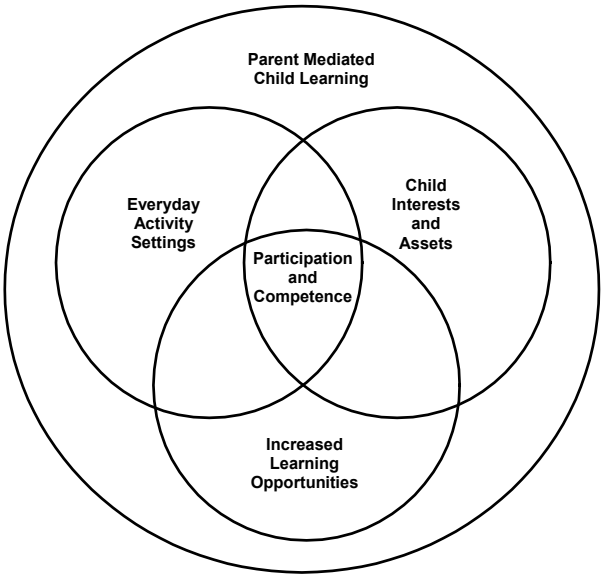

Figure 1. Major components of the contextually mediated practices™ model for providing young children interest-based everyday learning opportunities.

Everyday Activity Settings

CMP uses everyday activity settings that occur as part of children's family and community lives as primary contexts for child learning. Activity settings are everyday experiences, opportunities, and events involving children's interactions with the social and nonsocial environment (Dunst & Bruder, 1999; Dunst, Bruder, Trivette, Raab, & McLean, 2001; Farver, 1999). Research indicates that everyday activities most likely to serve as sources of children's development-enhancing learning opportunities are ones that are interest-based, engaging, provide opportunities for competence expression and child exploration, and promote children's recognition of their own abilities to influence their social and nonsocial environments (Dunst, 2000, 2001; Dunst, Bruder, Trivette, Hamby et al., 2001).

Child Interests and Assets

CMP uses child interests as the basis for involving children in everyday activities serving as contexts for child learning, and child assets as the basis for building on a child's existing abilities and promoting the acquisition of new abilities. Child interests include a child's likes, preferences, favorites, etc., that influence his/her engagement and expression of competence in everyday activities (Dunst, Herter, & Shields, 2000; Krapp, Hidi, & Renninger, 1992; Raab, 2005; Raab & Dunst, 2006b). Child assets include a child's abilities, skills, strengths, capabilities, etc. that he/she uses to engage in interactions with people and objects in different activities.

Increased Learning Opportunities

A primary goal of *CMP* is increased opportunity to participate in everyday activities providing interest-based learning opportunities. Research indicates that any one everyday activity is a source of many different kinds of learning opportunities (Dunst & Bruder, 1999). Increasing child learning opportunities is accomplished using a greater number of everyday activities that provide opportunities for interest expression, ensuring variety in the kinds of activities used as contexts for child learning, and increasing the frequency of child participation in everyday activities (Dunst, Bruder, Trivette, Hamby et al., 2001). Everyday activities that have large degrees-of-freedom (Bruner, 1968) provide the best opportunities for interest-based child exploration and mastery. These are activities that encourage the production of a variety of different behaviors. Providing a child who likes water play an opportunity to play in water in the kitchen sink, bathtub, backyard hose, community swimming pool, and other places that encourage the child to do a variety of things more often is an example of increasing interest-based child learning opportunities. The goal is to insure *breadth* (many different kinds of learning activities) and *depth* (many different learning opportunities in any one activity) in a child's interest-based learning.

Parent-Mediated Everyday Child Learning

CMP places major emphasis on parent-implemented practices where practitioners support and strengthen parents' sense of competence and confidence to provide their children interest-based everyday learning opportunities. This includes methods and procedures for promoting parents' abilities to: (a) identify their children's interests, (b) identify everyday activities making up their children's family and community life, (c) use child interests as the basis for selecting activities that can be used as sources of interest-based everyday learning opportunities, (d) increase the number, frequency, and quality of child participation in everyday activities, (e) support children's participation and competence expression using responsive and supportive interactional styles, and (f) identify and use new learning opportunities for promoting child learning (see especially Raab & Dunst, 2006a). Parent-mediation includes any behavior or action that is purposefully and intentionally used by a parent for engaging a child in interest-based child learning opportunities.

Child Benefits

The expected child benefits of *CMP* are increased child participation in everyday activity (Shweder et al., 1998) and acquisition of new competencies for initiating and sustaining interactions with people and objects (Dunst, Holbert, & Wilson, 1990). Through interest-based participation in everyday activities, children have opportunities to practice existing skills, learn and perfect new skills useful for participation in a variety of activities (Farver, 1999), understand the relationship

between their own behavior and its consequences (MacTurk & Morgan, 1995), and become more involved in socially and culturally meaningful ways in everyday activities (Göncü, 1999). The desired outcome of *CMP* is increased child initiated participation in everyday activities using socially adaptive behaviors fostering children's understanding of their abilities to be producers of their own learning and development (e.g., Brandtstädter & Lerner, 1999; Lerner & Walls, 1999).

DEVELOPMENT OF THE CHECKLISTS

The family and community activities on the *Interest-Based Everyday Activity Checklists* were identified primarily from an extensive review of available research (e.g., Dent-Read & Zukow-Goldring, 1997; Göncü, 1999; Rogoff, Mistry, Göncü, & Mosier, 1993; Tudge, Putnam, & Sidden, 1994) and findings from survey studies investigating infant, toddler, and preschooler participation in everyday family and community activities (Dunst, Hamby, Trivette, Raab, & Bruder, 2000, 2002). Secondary sources of information included parents' open-ended survey responses to the question "Which activities does your child get to do as part of family or community life where your child best learns important behavior?" (Dunst & Raab, 2004) and the *Everyday Early Literacy Experiences Scale* (Dunst, Raab, & Shue, in press). Patterns of young children's age-related involvement in everyday activities were used to develop the checklist content for each of the three age groups (Dunst et al., 2002). The infants, toddlers, and preschoolers whose participation in the activities constituted the focus of analysis included children with identified disabilities, children demonstrating developmental delays, children considered at-risk for poor developmental outcomes, and children who were typically developing.

Table 1 shows the main categories of activities that were used to identify checklist content. These categories were generated from analyses of survey data gathered from parents and other caregivers in 48 States, Puerto Rico, and Micronesia. The categories were found to be sources of many different learning opportunities. Closer examination of the activities on the surveys found everyday learning opportunities to be an interesting mix of planned and unplanned, formal and informal, and structured and unstructured experiences. More interestingly and importantly, the activities that were found to be most associated with positive child and parent benefits were ones that happened routinely as part of everyday life (Trivette, Dunst, & Hamby, 2004).

One very important observation needs to be made about the everyday activities infants, toddlers, and preschoolers experience as part of family and community life. The activities that young children experience are often ones where their involvement is indirect or peripheral but where they nonetheless benefit behaviorally and developmentally (see especially Lave & Wenger, 1991). Many activities that young children become involved in are adult activities (e.g., Rogoff, Mosier, Mistry, & Göncü, 1993) or the activities of older children (e.g., Lancy, 1996) that draw infants, toddlers, and preschoolers into interactions with people and materials that provide contexts for many different

Table 1
Categories and Examples of Everyday Family and Community Activities

Family Activities	Community Activities
Family Routines • Cooking Meals • Food Shopping	*Family Excursions* • Car/Bus Rides • Food Shopping
Parenting Routines • Child's Bathtime • Child's Bedtime	*Family Outings* • Eating Out • Visiting Friends
Child Routines • Dressing • Brushing Teeth	*Play Activities* • Playground Slide • Hiding Games
Literacy Activities • Storytelling • Looking at Books	*Community Activities* • Libraries • Children's Festivals
Play Activities • Drawing • Parent/child	*Recreation Activities* • Swimming • Street Hockey
Entertainment Activities • Dancing • Music	*Children's Attractions* • Petting Zoos • Children's Museums
Family Celebrations • Get Togethers • Birthdays	*Art/Entertainment* • Story Tellers • Music Concerts
Physical Play • Rough Housing • Playing Ball	*Groups/Organizations* • Parent/Child Play • Movement Classes
Family Rituals • Family Talks • Saying Grace	*Religious Activities* • Sunday School • Spirit Dancing
Socialization Activities • Visiting Friends • Family Gatherings	*Sport Activities* • T-Ball • Soccer
Outdoor Activities • Garden Activities • Yard Work	*Outdoor Activities* • Neighborhood Walks • Parades

kinds of learning opportunities. Tagging along to an older sibling's baseball game where a toddler is afforded opportunities to play with baseballs, "run" the bases, attempt to swing a bat, and clap and cheer at his sister making a hit are examples of these peripheral learning opportunities. Many of the everyday activities on the *Interest-Based Everyday Learning Activities Checklists* are these kinds of learning opportunities. Parents and practitioners using the checklists should therefore be cognizant of the potential learning opportunities afforded by these "tag along" activities.

Everyday Family Activities

The everyday activities that happen as part of family life are a rich mix of different kinds of learning opportnities. Some are adult activities in which the child takes part like cooking meals and working outside in the yard. Many activities are ones parents do with and for their children each and every day like getting the child ready for bed and feeding the child breakfast. Other activities are ones that provide children opportunities to practice and learn specific abilities like dressing and undressing, washing one's hands, and brushing teeth. Many activities involve contact with other children and adults like having friends over to play and a family picnic. Some encourage children to practice or learn different kinds of physical abilities like riding a tricycle or catching a ball. Others encourage children to participate in activities like dancing and singing, and learning and practicing different kinds of abilities as part of lap games (peek-a-boo, so-big, etc.). Parent/child activities like looking at pictures in a book and listening to stories provide children literacy experiences. Other activities are special family events like birthday parties which provide children learning opportunities like waving hi and bye, singing and playing games, and getting held and talked to by different family members.

Everyday Community Activities

The many different kinds of everyday activities children experience as part of community life are also an interesting mix of learning opportunities. Some occur as part of everyday adult activity like car or bus rides and food shopping. Many activities happen as part of family rituals like going to church or visiting grandparents every Sunday afternoon. Others happen as part of child participation in adult activities like camping, hiking, and water sports (e.g., boating). Still others happen as part of community celebrations like parades, festivals, and county fairs.

Other community activities are geared more toward children themselves. Climbing on playground equipment and going to a play group at a community center are examples of these kinds of activities. Getting to pet baby animals at a pet store or on a farm are other kinds of children's learning opportunities. Hands-on science center activities, water play at a community park, feeding ducks at a community pond, listening to stories at a library, and getting to dance and sing at a children's fair provide lots of child learning opportunities. "Going along" with older siblings to ball games, karate classes, music lessons, and the like open up all kinds of learning opportunities for young children. Going on errands with mom or dad, going fishing with grandpa, helping grandma with church activities, and playing with cousins at a family reunion, also provide different kinds of opportunities for learning to take place.

Cultural and Context Specific Activities

The largest majority of activities on the *Interest-Based Everyday Activity Checklists* are universal or near universal activities. That is, the activities, or variations of the activities, are experienced by most children as part of everyday family and community activities (albeit in different ways).

There are, however, many activities that are either cultural or context specific. Learning opportunities that happen as part of cultural rituals or customs such as family gatherings or tribal dances and singing are examples of these kinds of activities. Context-specific activities are ones that happen as a consequence of where one happens to live. For example, children who live in the northern United States are more likely to experience activities that involve playing in the snow such as sledding and building a snowman, whereas children who live near the ocean are more likely to experience activities that involve water play such as wading in the ocean and building sand castles year-round. Space is included on the checklists for adding these (as well as other) activities that are interest-based.

USING THE CHECKLISTS

A four-step process is used to complete the checklists and to use the information for promoting interest-based child participation in everyday family and community activities. The four steps are: (1) identification of child interests, (2) identification of checklist activities that match child interests, (3) selection of activities that provide or could provide the most frequent opportunities for interest-based learning, and (4) procedures for increasing child participation in these interest-based learning opportunities. Copies of the checklists are included in the Appendix.

Identifying Child Interests

The process of selecting checklist activities as sources of everyday learning opportunities begins with identifying child interests. It is helpful to preface the process of identifying child interests by explaining to the parent that children learn best when they are involved in learning activities that are fun and enjoyable, and which provide them learning opportunities and experiences that are linked to their interests (i.e., are interest-based).

Child interests can be identified either formally using interest-based assessment tools (e.g., Dunst, Herter et al., 2000; Dunst, Roberts, & Snyder, 2004) or informally by simply asking a parent to list or describe the child's interests. Identifying a child's interests informally is done by asking questions like: "What does your child enjoy doing?," What does your child get excited about?," What makes your child laugh or smile?," "If your child could get to do anything (s)he wanted, what would (s)he do?," "What does your child prefer to do?," and "Who does your child prefer to be with?" The purposes of identifying a child's interests are to: (1) focus parent attention on positive child qualities and (2) use this information to identify learning opportunities that are contexts for interest expression.

Completing the Checklists

It is helpful to preface the completion of this step by explaining to the parent that everyday family and community life is made up of lots of different activities that provide young children opportunities to learn and practice different behaviors and skills and to learn new things. It is also helpful to say that we sometimes overlook these learning opportunities because they happen naturally as part of everyday life. The practitioner and parent should also remember that many of the activities on the checklists are "tag alongs" that provide children development-instigating learning opportunities as a result of adult or older sibling participation in the activities. A toddler who gets to splash and play in water as a consequence of canoeing with his or her parents is an example of this kind of activity.

A checklist is completed by asking the parent to "Keep in mind the child interests you just described, and go through the list of activities and pick those that would provide your child opportunities to use or express those interests." The parent should be asked to list activities not included on a checklist in the spaces provided on the recording form. The checklists also include prompts for listing activities that are cultural and context specific.

Selecting Interest-Based Learning Activities

The third step involves the selection of activities among all those checked that occur or could occur most often or most frequently, and that provide the child many interest-based learning opportunities in an activity. Some activities may not happen often but could be opportunities that can easily be made to happen more frequently. Both types of activities are appropriate as sources of everyday, interest-based learning opportunities. The best activities are ones that provide a child many different kinds of learning opportunities.

Increasing Participation in Interest-Based Activities

The fourth step involves the development of a "plan" to increase child participation in the activities, increasing the *breadth* and *depth* of the interest-based everyday learning activities selected in Step 3. This includes both participation in a larger number of everyday activities *(breadth)* and lots of learning opportunities in any one activity *(depth)*. The last page of each checklist recording form includes a template for developing an action plan to provide a child as many opportunities as possible to be involved in the selected activities. The reader is referred to Raab (2005), Roper et al. (2005), and Raab and Dunst (2006a) for descriptions of different ways of helping parents plan and implement strategies for increasing child involvement in everyday learning activities.

CONCLUSION

This *CASEtool* included information about the development and use of the *Interest-Based Everyday Activity Checklists*. Earlier versions of the checklists were field tested with nine practitioners promoting parents' use of interest-based everyday child learning opportunities. All nine practitioners indicated that the checklists were *very helpful* or *extremely helpful* for having parents identify their children's interests and for choosing everyday activities as sources of their children's learning opportunities. Eight of the nine practitioners indicated that the checklists were *very helpful* or *extremely helpful* for identifying everyday activities that were contexts for interest-based child learning. These preliminary results indicate that the checklists, and procedures for using them, achieved our intent in developing the assessment/intervention tools.

The checklists constituting the focus of this *CASEtool* are part of a set of tools for strengthening practitioners' abilities to promote parents' use of *CMP* with their children. The reader is referred to Raab and Dunst (2006a) and Raab (2005) for descriptions of those tools and procedures. The different checklists and tools were specifically developed to promote practitioner adoption and use of practices supporting and strengthening parents' mediation of interest-based child learning. Additional work with parents and

practitioners is planned to further evaluate the usefulness of the checklists and administration procedures for their intended purposes.

REFERENCES

Brandtstädter, J., & Lerner, R. M. (Eds.). (1999). *Action and self-development: Theory and research through the life span*. Thousand Oaks, CA: Sage.

Bruner, J. S. (1968). *Processes of cognitive growth: Infancy.* Worcester, MA: Clark University Press.

Dent-Read, C., & Zukow-Goldring, P. (Eds.). (1997). *Evolving explanations of development: Ecological approaches to organism-environment systems.* Washington, DC: American Psychological Association.

Dunst, C. J. (2000). Everyday children's learning opportunities: *Characteristics and consequences. Children's Learning Opportunities Report, 2*(1). Available at http://www.everydaylearning.info/reports/lov2-1.pdf

Dunst, C. J. (2001). Participation of young children with disabilities in community learning activities. In M. J. Guralnick (Ed.), *Early childhood inclusion: Focus on change* (pp. 307-333). Baltimore: Brookes.

Dunst, C. J. (2006). Parent-mediated everyday child learning opportunities: I. Foundations and operationalization. *CASEinPoint, 2*(2). Available at http://www.fippcase.org/caseinpoint/caseinpoint_vol2_no2.pdf

Dunst, C. J., & Bruder, M. B. (1999). Family and community activity settings, natural learning environments, and children's learning opportunities. *Children's Learning Opportunities Report, 1*(2), 1-2. Available at http://www.everydaylearning.info/reports/lov1-2.pdf

Dunst, C. J., Bruder, M. B., Trivette, C. M., Hamby, D., Raab, M., & McLean, M. (2001). Characteristics and consequences of everyday natural learning opportunities. *Topics in Early Childhood Special Education, 21,* 68-92.

Dunst, C. J., Bruder, M. B., Trivette, C. M., Raab, M., & McLean, M. (2001). Natural learning opportunities for infants, toddlers, and preschoolers. *Young Exceptional Children, 4*(3), 18-25 (Erratum in Vol. 4(4), 25).

Dunst, C. J., Hamby, D., Trivette, C. M., Raab, M., & Bruder, M. B. (2000). Everyday family and community life and children's naturally occurring learning opportunities. *Journal of Early Intervention, 23,* 151-164.

Dunst, C. J., Hamby, D., Trivette, C. M., Raab, M., & Bruder, M. B. (2002). *Young children's participation in everyday family and community activity. Psychological Reports, 91*, 875-897.

Dunst, C. J., Herter, S., & Shields, H. (2000). Interest-based natural learning opportunities. *Young Exceptional Children Monograph Series No. 2: Natural Environments and Inclusion,* 37-48.

Dunst, C. J., Holbert, K. A., & Wilson, L. L. (1990). Strategies for assessing infant sensorimotor interactive competencies. In E. Gibbs & D. Teti (Eds.), *Interdisciplinary assessment of infants: A guide for early intervention practitioners* (pp. 91-112). Baltimore: Brookes.

Dunst, C. J., & Raab, M. (2004). Parents' and practitioners' perspectives of young children's everyday natural learning environments. *Psychological Reports, 93,* 251-256.

Dunst, C. J., Raab, M., & Shue, P. (in press). *Early literacy experiences scale.* Asheville, NC: Winterberry Press.

Dunst, C. J., Roberts, K., & Snyder, D. (2004). *Spotting my child's very special interests: A workbook for parents.* Asheville, NC: Winterberry Press.

Farver, J. A. M. (1999). Activity setting analysis: A model for examining the role of culture in development. In A. Göncü (Ed.), *Children's engagement in the world: Sociocultural perspectives* (pp. 99-127). Cambridge, UK: Cambridge University Press.

Göncü, A. (Ed.). (1999). *Children's engagement in the world: Sociocultural perspectives.* Cambridge, UK: Cambridge University Press.

Krapp, A., Hidi, S., & Renninger, K. (1992). Interest, learning and development. In K. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 3-25). Hillsdale, NJ: Erlbaum.

Lancy, D. F. (1996). *Playing on the mother-ground: Cultural routines for children's development.* New York: Guilford Press.

Lave, J., & Wenger, E. (1991). S*ituated learning: Legitimate peripheral participation.* New York: Cambridge University Press.

Lerner, R. M., & Walls, T. (1999). Revisiting Individuals as producers of their development: From dynamic interactionism to developmental systems. In J. Brandtstädter & R. M. Lerner (Eds.), *Action and self-development: Theory and research through the life span* (pp. 3-36). Thousand Oaks, CA: Sage.

MacTurk, R. H., & Morgan, G. A. (Eds.). (1995). *Advances in applied developmental psychology: Vol. 12. Mastery motivation: Origins, conceptualizations, and applications.* Norwood, NJ: Ablex.

Raab, M. (2005). Interest-based child participation in everyday learning activities. *CASEinPoint, 1*(2), 1-

5. Available at http://www.fippcase.org/caseinpoint/caseinpoint_vol1_no2.pdf

Raab, M., & Dunst, C. J. (2006a). Checklists for promoting parent-mediated everyday child learning opportunities. *CASEtools, 2*(1), 1-9. Available at http://www.fippcase.org/casetools/casetools_vol2_no1.pdf

Raab, M., & Dunst, C. J. (2006b). Influence of child interests on variations in child behavior and functioning. *Bridges, 4*(4), 1-22. Available at http://www.evidencebasedpractices.org/bridges/bridges_vol4_no4.pdf

Rogoff, B., Mistry, J., Göncü, A., & Mosier, C. (1993). Guided participation in cultural activities by toddlers and caregivers. *Monographs of the Society for Research in Child Development, 58*(8, Serial No. 236).

Rogoff, B., Mosier, C., Mistry, J., & Göncü, A. (1993). Toddlers' guided participation with their caregivers in cultural activity. In E. A. Forman, N. Minick, & C. A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development* (pp. 230-253). New York: Oxford University Press.

Roper, N., Iauch, L., & Gurley, C. (2005). Language learning in children exhibiting characteristics of apraxia using contextually mediated practices. *CASEinPoint, 1*(3), 1-5. Available at http://www.fippcase.org/caseinpoint/caseinpoint_vol1_no3.pdf

Shweder, R. A., Goodnow, J., Hatano, G., LeVine, R. A., Markus, H., & Miller, P. (1998). The cultural psychology of development: One mind, many mentalities. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (5th ed., pp. 865-937). New York: Wiley.

Trivette, C. M., Dunst, C. J., & Hamby, D. (2004). Sources of variation in and consequences of everyday activity settings on child and parenting functioning. *Perspectives in Education, 22*(2), 17-35.

Tudge, J., Putnam, S., & Sidden, J. (1994). The everyday activities of American preschoolers: Lessons and work in two socio-cultural contexts. In A. Alvarez & P. del Río (Eds.), *Educations as cultural construction* (Explorations in socio-cultural studies) (pp. 109-120). Madrid, Spain: Fundación Infancia y Aprendizaje.

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Appendix A

Interest-Based Everyday Activity Checklists

The three different versions of the *Interest-Based Everyday Activity Checklists* are included in this Appendix. Either the chronological or developmental age of a child is used to select which checklist is used with a parent and child. A child's chronological age is used to select the appropriate checklist when the child is not showing a delay in his or her development. A child's developmental age is used to select the appropriate checklist when the child is demonstrating a delay in his or her development. For example, if a child is 34 months of age but is functioning at a 8 or 9 month level developmentally, it is best to use the early preschool version of the checklists. Similarly, if a child is 47 months of age, but is functioning at a 28 month level of development, the middle preschool version of the checklists would be used to do an interest-based activity identification assessment. The table below can be used as a guide for selecting the appropriate checklist for any one child.

Child Age (Months)	Age Range	Everyday Activity Checklists
0	0	
4		
8		Early Preschool Version
12		
16	15	
20		
24		Middle Preschool Version
28		
32		
36	36	
40		
44		
48		Later Preschool Version
52		
56		
60	60	

Early Preschool Interest-Based Everyday Activity Checklist

Jennifer Swanson, Melinda Raab, Nicole Roper, and Carl J. Dunst

Identifying Information

Child's Name _____ Date of Birth _____

Age (Months) _____ Today's Date _____

Person Completing the Checklist _____ Relationship to Child _____

Checklist Description

This checklist includes a list of everyday activities that are sources of learning opportunities for infants and very young children functioning below 15 to 18 months of age. The activities are a mix of things that children get to be involved in as part of everyday family and community life, things parents and children do together, things children become involved in because of adult interests and activities, and things that simply happen day-in and day-out as part of everyday living. The checklist is used to identify activities that are interest-based and would provide your child opportunities to learn and practice many different kinds of skills and behaviors. Simply follow the steps described below to make your child's learning full of wonderful possibilities.

Using the Checklists

Step 1. Identifying a Child's Interest. Start by making a list of all the things, people, places, and activities that ***interest*** your child. "What does your child enjoy doing?" "What gets your child excited?" "What does your child prefer or like to do?" "What makes your child laugh or smile?" "What does your child choose to do most often?" "Who does your child prefer to be with?" List your child's interests in the space provided on the next two pages.

Step 2. Completing the Checklist. Keep in mind your answers to the Step 1 questions. Go through the lists of activities on the next two pages, and ***check the activities*** that provide or could provide your child opportunities to use or express his or her interests. Add activities that are not included on the checklists that are important to your family or happen because of where you live and which are or would be interesting to your child. Don't overlook ***tag along*** activities that would include opportunities for interest-expression.

Step 3. Selecting Interest-Based Learning Activities. Go back through the list of activities you checked, and ***circle those activities*** that do or could happen often for your child and which best match your child's interests. The best activities are ones that provide lots of opportunities for a child to do things (s)he is interested in doing as well as learn new things.

Step 4. Develop an Action Plan. The last page of the checklist includes one way you can be sure you and your child can take advantage of all the learning possibilities that are part of your everyday family and community life. Simply complete each section and you will have a useful ***plan*** for providing your child interest-based everyday learning opportunities.

My Child's Interest

Your Child's Interests

Keep in mind your child's interests (things he or she likes to do, enjoys doing, that get him or her excited, and so forth), and check all activities that you think would be ones that would give your child opportunities to use or express those interests.

Everyday Activities

The following is a list of activities many children experience as part of everyday living. Please check those activities that best match your child's interests. Don't forget about ***tag along*** activities.

- ☐ Attending a playgroup
- ☐ Attending church/synagogue
- ☐ Being read to
- ☐ Being sprayed by a garden hose
- ☐ Cuddling/rocking with adult
- ☐ Dancing with mom or dad
- ☐ Diaper changing
- ☐ Doing errands with mom or dad
- ☐ Doing laundry with mom or dad
- ☐ Dressing/undressing
- ☐ Eating meals or snacks
- ☐ Eating out
- ☐ Feeding ducks at the pond
- ☐ Finger painting
- ☐ Getting out of bed/waking up
- ☐ Getting ready for bed/naptime
- ☐ Going grocery shopping with mom or dad
- ☐ Going on a bike ride
- ☐ Going on a hike
- ☐ Going on a stroller ride
- ☐ Going on a neighborhood walk
- ☐ Going on nature walks
- ☐ Going to siblings' ball games
- ☐ Going to the library
- ☐ Having picnics
- ☐ Helping with household chores (e.g., vacuuming)
- ☐ Listening to bedtime stories
- ☐ Listening to music
- ☐ Listening to story times
- ☐ Listening to/saying nursery rhymes
- ☐ Looking at and talking about photographs
- ☐ Looking at/reading cereal boxes/labels
- ☐ Looking in mirrors
- ☐ Picking up siblings from school/childcare
- ☐ Picking up toys
- ☐ Playing finger games
- ☐ Playing in a stream/creek/river
- ☐ Playing in a sprinkler
- ☐ Playing in a wading pool
- ☐ Playing in dirt or sand
- ☐ Playing in kitchen cupboards
- ☐ Playing lap games (e.g., peek-a-boo, so big)
- ☐ Playing on park/playground equipment
- ☐ Playing turn-taking vocal games
- ☐ Playing with balls/balloons
- ☐ Playing with bubbles
- ☐ Playing with busy boxes/baby gyms
- ☐ Playing with magnetic letters/shapes
- ☐ Playing with musical toys
- ☐ Playing with other children

My Child's Interest

- ☐ Playing with/taking care of pets
- ☐ Playing with playhouse toys
- ☐ Playing with push/pull toys
- ☐ Playing with responsive toys (e.g., mobile, roly poly)
- ☐ Playing with shape sorters/puzzles
- ☐ Playing with talking toys (e.g., See and Say)
- ☐ Playing with teething toys
- ☐ Praying/saying Grace
- ☐ Preparing meals or snacks
- ☐ Riding in a boat
- ☐ Riding in wagon/riding toys
- ☐ Rough housing/playing tickle games
- ☐ Saying hellos/good-byes
- ☐ Shopping at the mall/department stores
- ☐ Singing
- ☐ Swimming at the pool
- ☐ Taking a bath
- ☐ Taking a car, bus, train ride, etc.
- ☐ Using crayons, markers, etc.
- ☐ Using play dough, silly putty, etc.
- ☐ Visiting animals (e.g., pet store/zoo)
- ☐ Visiting friends, relatives, or neighbors
- ☐ Washing hands/face
- ☐ Watching mom or dad write notes/lists
- ☐ Watching TV/videos
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Special Family Activities

Many families have special events, celebrations and traditions that are important to them. Please list those special family activities that you know or think might be interesting to your child.

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Activities Where You Live

Many families have special experiences and learning opportunities because of where they live. Please list those activities that your child gets to be a part of because of where you live that would be interesting to your child.

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Expanding Your Child's Learning Opportunities

Now that you have selected the best activities for everyday child learning, the next step is to use this information to provide your child lots of opportunities to use his or her interests to do things (s)he is able to do and to learn new things. The following is a helpful way for providing your child interest-based learning opportunities.

	Interest-Based Activities	When/Where Activities Will Occur	What My Child Will Get to Do	What I Can Do To Help My Child Learn	How I Will Know My Child Benefited
Let's Continue Doing These Activities…					
Let's Try These New Activities…					

Middle Preschool Interest-Based Everyday Activity Checklist

Jennifer Swanson, Melinda Raab, Nicole Roper, and Carl J. Dunst

Identifying Information

Child's Name _____ Date of Birth _____

Age (Months) _____ Today's Date _____

Person Completing the Checklist _____ Relationship to Child _____

Checklist Description

This checklist includes a list of everyday activities that are sources of learning opportunities for children functioning between 15 and 36 months of age. The activities are a mix of things that children get to be involved in as part of everyday family and community life, things parents and children do together, things children become involved in because of adult interests and activities, and things that simply happen day-in and day-out as part of everyday living. The checklist is used to identify activities that are interest-based and would provide your child opportunities to learn and practice many different kinds of skills and behaviors. Simply follow the steps described below to make your child's learning full of wonderful possibilities.

Using the Checklists

Step 1. Identifying a Child's Interest. Start by making a list of all the things, people, places, and activities that ***interest*** your child. "What does your child enjoy doing?" "What gets your child excited?" "What does your child prefer or like to do?" "What makes your child laugh or smile?" "What does your child choose to do most often?" "Who does your child prefer to be with?" List your child's interests in the space provided on the next two pages.

Step 2. Completing the Checklist. Keep in mind your answers to the Step 1 questions. Go through the lists of activities on the next two pages, and ***check the activities*** that provide or could provide your child opportunities to use or express his or her interests. Add activities that are not included on the checklists that are important to your family or happen because of where you live and which are or would be interesting to your child. Don't overlook ***tag along*** activities that would include opportunities for interest-expression.

Step 3. Selecting Interest-Based Learning Activities. Go back through the list of activities you checked, and ***circle those activities*** that do or could happen often for your child and which best match your child's interests. The best activities are ones that provide lots of opportunities for a child to do things (s)he is interested in doing as well as learn new things.

Step 4. Develop an Action Plan. The last page of the checklist includes one way you can be sure you and your child can take advantage of all the learning possibilities that are part of your everyday family and community life. Simply complete each section and you will have a useful ***plan*** for providing your child interest-based everyday learning opportunities.

My Child's Interest

Your Child's Interests

Keep in mind your child's interests (things he or she likes to do, enjoys doing, that get him or her excited, and so forth), and check all activities that you think would be ones that would give your child opportunities to use or express those interests.

Everyday Activities

The following is a list of activities many children experience as part of everyday living. Please check those activities that best match your child's interests. Don't forget about ***tag along*** activities.

- ☐ Attending a playgroup
- ☐ Attending church/synagogue
- ☐ Attending movement/music class
- ☐ Attending neighborhood gatherings
- ☐ Attending Sunday school/kid's church
- ☐ Being read to
- ☐ Brushing teeth
- ☐ Choosing books at the library
- ☐ Collecting leaves or rocks
- ☐ Creating an art project/craft
- ☐ Cuddling with parent/caregiver
- ☐ Cutting/tearing pictures (e.g., magazines, catalogs)
- ☐ Dancing
- ☐ Diaper changing
- ☐ Doing errands with mom or dad
- ☐ Doing laundry with mom or dad
- ☐ Dressing/undressing
- ☐ Eating meals or snacks
- ☐ Eating out
- ☐ Feeding ducks at the pond
- ☐ Finger painting
- ☐ Gardening/planting flowers
- ☐ Getting out of bed/waking up
- ☐ Getting ready for bed/naptime
- ☐ Going on a camping trip
- ☐ Going on a play date
- ☐ Going fishing with mom or dad
- ☐ Going on a bike ride
- ☐ Going on a stroller ride
- ☐ Going on a hike
- ☐ Going on a neighborhood walk
- ☐ Going on nature walks
- ☐ Going to a movie
- ☐ Going to a nature center
- ☐ Going to siblings' ball games/sports events
- ☐ Having cookouts/barbecues
- ☐ Having friends over to play
- ☐ Having picnics
- ☐ Helping with household chores
- ☐ Listening to bedtime stories
- ☐ Listening to music
- ☐ Listening to storytellers/story times
- ☐ Listening to/saying nursery rhymes
- ☐ Looking at and talking about photographs
- ☐ Looking at/reading cereal boxes/labels
- ☐ Participating in family talks
- ☐ Picking up siblings from school/childcare
- ☐ Picking up toys
- ☐ Playing at an indoor playland
- ☐ Playing chase/running
- ☐ Playing dress-up
- ☐ Playing finger games
- ☐ Playing hide-n-seek
- ☐ Playing house
- ☐ Playing in a stream/creek/river
- ☐ Playing in a sprinkler
- ☐ Playing in a wading pool

My Child's Interest

- ☐ Playing in dirt/mud/sand
- ☐ Playing musical instruments
- ☐ Playing on park/playground equipment
- ☐ Playing on the computer/typewriter
- ☐ Playing with a garden hose
- ☐ Playing with balls/balloons
- ☐ Playing with bubbles
- ☐ Playing with busy boxes/busy centers
- ☐ Playing with magnetic letters/shapes
- ☐ Playing with other children/siblings
- ☐ Playing with pets
- ☐ Playing with playhouse toys
- ☐ Playing with puppets, dolls, etc.
- ☐ Playing with shape sorters/puzzles
- ☐ Playing with toys that play music, talk, etc.
- ☐ Playing with trucks/cars/boats
- ☐ Playing with water toys
- ☐ Playing in a sandbox/sand table
- ☐ Praying/saying Grace
- ☐ Preparing meals or snacks
- ☐ Renting/returning videos
- ☐ Riding in a boat
- ☐ Riding in wagon/riding toys
- ☐ Rough housing/playing tickle games
- ☐ Saying hellos/good-byes
- ☐ Shopping at the mall/department stores
- ☐ Shopping for groceries
- ☐ Singing
- ☐ Swimming/floating at the pool
- ☐ Taking a bath
- ☐ Taking a car, bus, train ride, etc.
- ☐ Taking care of pets (e.g., feeding)
- ☐ Toileting/going to bathroom
- ☐ Using crayons, markers, paints, etc.
- ☐ Using play dough, silly putty, etc.
- ☐ Visiting animals (e.g., pet store/zoo)
- ☐ Visiting neighbors, friends, relatives
- ☐ Washing hands/face
- ☐ Watching mom or dad write notes/lists
- ☐ Watching TV/videos
- ☐ Watering plants/grass/flowers
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Special Family Activities

Many families have special events, celebrations and traditions that are important to them. Please list those special family activities that you know or think might be interesting to your child.

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Activities Where You Live

Many families have special experiences and learning opportunities because of where they live. Please list those activities that your child gets to be a part of because of where you live that would be interesting to your child.

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Expanding Your Child's Learning Opportunities

Now that you have selected the best activities for everyday child learning, the next step is to use this information to provide your child lots of opportunities to use his or her interests to do things (s)he is able to do and to learn new things. The following is a helpful way for providing your child interest-based learning opportunities.

	Interest-Based Activities	When/Where Activities Will Occur	What My Child Will Get to Do	What I Can Do To Help My Child Learn	How I Will Know My Child Benefited
Let's Continue Doing These Activities…					
Let's Try These New Activities…					

Later Preschool Interest-Based Everyday Activity Checklist

Jennifer Swanson, Melinda Raab, Nicole Roper, and Carl J. Dunst

Identifying Information

Child's Name _____ Date of Birth _____

Age (Months) _____ Today's Date _____

Person Completing the Checklist _____ Relationship to Child _____

Checklist Description

This checklist includes a list of everyday activities that are sources of learning opportunities for preschool-aged children 36 months of age or older. The activities are a mix of things that children get to be involved in as part of everyday family and community life, things parents and children do together, things children become involved in because of adult interests and activities, and things that simply happen day-in and day-out as part of everyday living. The checklist is used to identify activities that are interest-based and would provide your child opportunities to learn and practice many different kinds of skills and behaviors. Simply follow the steps described below to make your child's learning full of wonderful possibilities.

Using the Checklists

Step 1. Identifying a Child's Interest. Start by making a list of all the things, people, places, and activities that ***interest*** your child. "What does your child enjoy doing?" "What gets your child excited?" "What does your child prefer or like to do?" "What makes your child laugh or smile?" "What does your child choose to do most often?" "Who does your child prefer to be with?" List your child's interests in the space provided on the next two pages.

Step 2. Completing the Checklist. Keep in mind your answers to the Step 1 questions. Go through the lists of activities on the next two pages, and ***check the activities*** that provide or could provide your child opportunities to use or express his or her interests. Add activities that are not included on the checklists that are important to your family or happen because of where you live and which are or would be interesting to your child. Don't overlook ***tag along*** activities that would include opportunities for interest-expression.

Step 3. Selecting Interest-Based Learning Activities. Go back through the list of activities you checked, and ***circle those activities*** that do or could happen often for your child and which best match your child's interests. The best activities are ones that provide lots of opportunities for a child to do things (s)he is interested in doing as well as learn new things.

Step 4. Develop an Action Plan. The last page of the checklist includes one way you can be sure you and your child can take advantage of all the learning possibilities that are part of your everyday family and community life. Simply complete each section and you will have a useful ***plan*** for providing your child interest-based everyday learning opportunities.

My Child's Interest

Your Child's Interests

Keep in mind your child's interests (things he or she likes to do, enjoys doing, that get him or her excited, and so forth), and check all activities that you think would be ones that would give your child opportunities to use or express those interests.

Everyday Activities

The following is a list of activities many children experience as part of everyday living. Please check those activities that best match your child's interests. Don't forget about ***tag along*** activities.

- ☐ Attending movement/music class
- ☐ Attending a playgroup
- ☐ Attending church/synagogue
- ☐ Attending girl/boy scouts meetings
- ☐ Attending club meetings
- ☐ Attending neighborhood gatherings
- ☐ Attending Sunday school/kid's church
- ☐ Being read to/reading
- ☐ Being sprayed by the garden hose
- ☐ Bird watching
- ☐ Bowling
- ☐ Brushing teeth
- ☐ Choosing books at the library
- ☐ Collecting leaves or rocks
- ☐ Creating an art project/craft
- ☐ Cuddling with adult
- ☐ Cutting/tearing pictures (e.g., magazines, catalogs)
- ☐ Dancing
- ☐ Dictating lists, letters, or stories
- ☐ Doing yard work
- ☐ Dressing/undressing
- ☐ Eating meals or snacks
- ☐ Eating out
- ☐ Feeding ducks at the pond
- ☐ Flying a kite
- ☐ Gardening/planting flowers
- ☐ Getting out of bed/waking up
- ☐ Getting ready for bed/naptime
- ☐ Going on a camping trip
- ☐ Going fishing
- ☐ Going on a bike ride
- ☐ Going on a hike
- ☐ Going on a neighborhood walk
- ☐ Going on nature walks
- ☐ Going to a movie
- ☐ Going to work with a parent
- ☐ Going to a nature center/arboretum
- ☐ Having cookouts/barbecues
- ☐ Having friends over to play
- ☐ Having or going to parties
- ☐ Having picnics
- ☐ Helping do the laundry
- ☐ Helping to repair or build things
- ☐ Helping with household chores (e.g., doing dishes)
- ☐ Helping take care of/play with young siblings
- ☐ Helping with errands
- ☐ Jumping on a trampoline
- ☐ Listening to bedtime stories
- ☐ Listening to music
- ☐ Listening to storytellers/story times
- ☐ Listening to/saying nursery rhymes
- ☐ Looking at and talking about photos
- ☐ Looking at/reading cereal boxes/labels
- ☐ Looking at magazines, catalogs, etc.
- ☐ Participating in family talks
- ☐ Picking up toys
- ☐ Picking up siblings from school/childcare
- ☐ Planting or picking flowers
- ☐ Playing at an indoor playland
- ☐ Playing card or board games
- ☐ Playing chase/running
- ☐ Playing dress-up
- ☐ Playing finger games
- ☐ Playing guessing games

My Child's Interest

- ☐ Playing house
- ☐ Playing in a stream/creek/river
- ☐ Playing in a sandbox/sand table
- ☐ Playing in a sprinkler
- ☐ Playing in a wading pool
- ☐ Playing in dirt/mud/sand
- ☐ Playing miniature golf
- ☐ Playing musical instruments
- ☐ Playing on park/playground equipment
- ☐ Playing on the computer/typewriter
- ☐ Playing outdoor games (e.g., hide-n-go-seek)
- ☐ Playing sports (e.g., soccer, T-ball)
- ☐ Playing table games (e.g., air hockey)
- ☐ Playing video games/computer games
- ☐ Playing with action figures, dolls, puppets, etc.
- ☐ Playing with balls/balloons
- ☐ Playing with bubbles
- ☐ Playing with magnetic letters or shapes
- ☐ Playing with other children/siblings
- ☐ Playing with pets
- ☐ Playing with playhouse toys
- ☐ Playing with shape sorters/puzzles
- ☐ Playing with trucks/cars/boats
- ☐ Playing with water toys
- ☐ Praying/saying Grace
- ☐ Preparing meals or snacks
- ☐ Renting/returning videos
- ☐ Riding a bike
- ☐ Riding in a boat
- ☐ Riding in wagon/riding toys
- ☐ Roller skating/roller blading/skateboarding
- ☐ Rough housing/playing tickle games
- ☐ Saying hellos/good-byes
- ☐ Shopping (groceries/mall/department stores)
- ☐ Singing
- ☐ Swimming/floating at the pool
- ☐ Taking a bath
- ☐ Taking a car, bus, train ride
- ☐ Taking care of pets (e.g., feeding)
- ☐ Taking swimming lessons
- ☐ Talking on the telephone
- ☐ Toileting/going to bathroom
- ☐ Using crayons, markers, paints, etc.
- ☐ Using play dough, silly putty, etc.
- ☐ Visiting animals (e.g., pet store/zoo)
- ☐ Visiting neighbors, friends, relatives
- ☐ Washing hands/face
- ☐ Watching ball game/sports events
- ☐ Watching/helping parents write notes/lists
- ☐ Watching TV/videos
- ☐ _____
- ☐ _____
- ☐ _____
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- ☐ _____

Special Family Activities

Many families have special events, celebrations and traditions that are important to them. Please list those special family activities that you know or think might be interesting to your child.

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Activities Where You Live

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Expanding Your Child's Learning Opportunities

Now that you have selected the best activities for everyday child learning, the next step is to use this information to provide your child lots of opportunities to use his or her interests to do things (s)he is able to do and to learn new things. The following is a helpful way for providing your child interest-based learning opportunities.

	Interest-Based Activities	When/Where Activities Will Occur	What My Child Will Get to Do	What I Can Do To Help My Child Learn	How I Will Know My Child Benefited
Let's Continue Doing These Activities…					
Let's Try These New Activities…					

Appendix B

Expanding Children's Interest-Based Learning Opportunities

This appendix includes a recording form for taking results from a completed *Interest-Based Everyday Activity Checklist* (Appendix A) and using the information for increasing children's everyday interest-based learning opportunities. The *Action Plan* includes space for recording both the everyday activities that will be continued to be used as sources of interest-based learning opportunities and those activities which will be used to provide new everyday interest-based learning opportunities. The *Action Plan* also includes space for indicating when and where the activities will occur, what the child will get to do or learn in the activities, what the parent or child's caregiver can do to support and encourage child learning, and how it will be determined if the child benefits from participation in the activities. The *Action Plan* form can be duplicated and used for maintaining a record of the number and types of interest-based everyday child learning opportunities that are provided the child.

Expanding Your Child's Learning Opportunities

Now that you have selected the best activities for everyday child learning, the next step is to use this information to provide your child lots of opportunities to use his or her interests to do things (s)he is able to do and to learn new things. The following is a helpful way for providing your child interest-based learning opportunities.

	Interest-Based Activities	When/Where Activities Will Occur	What My Child Will Get to Do	What I Can Do To Help My Child Learn	How I Will Know My Child Benefited
Let's Continue Doing These Activities…					
Let's Try These New Activities…					

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