Developing the Playground Play Value and Usability Audit (PVUA) Tool: An Evaluation of Content Validity via an Expert Panel

Thomas Morgenthaler
Department of Occupational Science and Occupational Therapy, University College Cork
Division of Occupational Therapy & Arts Therapies, Queen Margret University

Janet Loebach
Department of Design and Environmental Analysis, and DECA Lab (Design Environments with|for Children & Adolescents), Cornell University

Helen Lynch
Department of Occupational Science and Occupational Therapy, University College Cork

Duncan Pentland
Division of Occupational Therapy & Arts Therapies, Queen Margret University

Anders Kottorp
Faculty of Health and Society, Malmö University

Christina Schulze
Institute of Occupational Therapy, School of Health Sciences, Zurich University of Applied Sciences

Citation: Morgenthaler, T., Loebach. J., Lynch, H., Pentalnd, D., Kottorp, A., & Schulze, C. (2025). Developing the playground play value and usability audit (PVUA) tool: An evaluation of content validity via an expert panel. *Children, Youth and Environments, 35*(2), 96-126. https://muse.jhu.edu/journal/850

Abstract

This study describes procedures for developing and exploring the content validity of a tool to audit playgrounds for play value and usability for diverse populations. Development of the tool included reviewing existing tools, creating an initial draft from evidence literature, followed by iterative rounds with an international, interdisciplinary expert panel (N=22). Panelists' comments and ratings of relevance and clarity supported refinements of items, content areas, scoring, instructions, and interpretations of the PVUA content. The preliminary tool consists of 203 items divided across 28 content areas and two domains. Future research should examine PVUA's reliability and construct validity using a diverse sample of playgrounds.

Keywords: playground, play value, usability, vulnerable populations, content validity

Introduction

Play is a fundamental right for all children, as recognized by Article 31 of the United Nations Convention on the Rights of the Child (United Nations Committee on the Rights of the Child, 1989) and has been found to be important for children's health, development, and wellbeing (Brussoni et al., 2015; Gill, 2014).

Public playgrounds are specifically designed for children's outdoor play, and are located in diverse public settings such as parks and schools (Burke, 2013; Woolley & Lowe, 2013). While public playgrounds are not the only outdoor environment where children play (Helleman et al., 2023; Martin et al., 2023), they are consistently identified by children as an important space for play (Prellwitz & Skär, 2007; van Heel et al., 2023) and are frequently visited by children and families (Jansson, 2010; Nicholson et al., 2015). While play equipment is a common feature of playgrounds, this study conceptualizes playgrounds as a space encompassing a broader range of features and materials, all of which can contribute to the play value of the environment (Brussoni et al., 2017; Martin et al., 2023; Morgenthaler et al., 2024; Woolley & Lowe, 2013). Such features may include manufactured play equipment, open spaces, natural features such as vegetation or boulders, wildlife-friendly habitats, malleable materials and loose parts, topographical features such as hills or depressions, as well as key supporting features like fencing and boundaries, seating, and amenities like restrooms (Morgenthaler et al., 2024).

For the purpose of this study, the construct *play value* was defined as the value for play that an environment, object, or piece of equipment brings to children's experience of play (Casey & Harbottle, 2018; Children's Play Policy Forum & UK Play Safety Forum, 2022; Playright, 2016; Woolley & Lowe, 2013). "Something may be described as having high play value if children are able to play with it in many different ways, integrate it into their own play or use it to expand or elaborate on their own ideas and actions" (Casey & Harbottle, 2018, p. 9). Previous research conceptualized play value in relation to playgrounds as supporting diverse and potential play opportunities (play types or play affordances) (Moore et al., 2023; Parker & Al-Maiyah, 2022; Wenger, Lynch, et al., 2023; Woolley & Lowe, 2013). In this study, play value of a playground was conceptualized by the diverse, multiple, and potential play affordances supported by diverse, varied and combined environmental features.

In this study, the concept of *usability* extends beyond accessibility and is concerned about equitable use of an environment by all children; usability has a stronger focus on inclusion (Iwarsson & Ståhl, 2003). Usability, in this study, is understood as environmental qualities identified in the literature that enable children with diverse abilities to play on playgrounds (Moore et al., 2023; Moore & Lynch, 2015; Prellwitz & Skär, 2007; Ripat & Becker, 2012). While accessibility is understood as getting to the playground or to the play equipment, usability prioritizes play—what children want to do on the playground (Moore et al., 2023). Considering environmental qualities that contribute to usability is therefore closer to the overarching goal of creating playgrounds that enhance play value for diverse ages and abilities (Iwarsson & Ståhl, 2003; Moore et al., 2023).

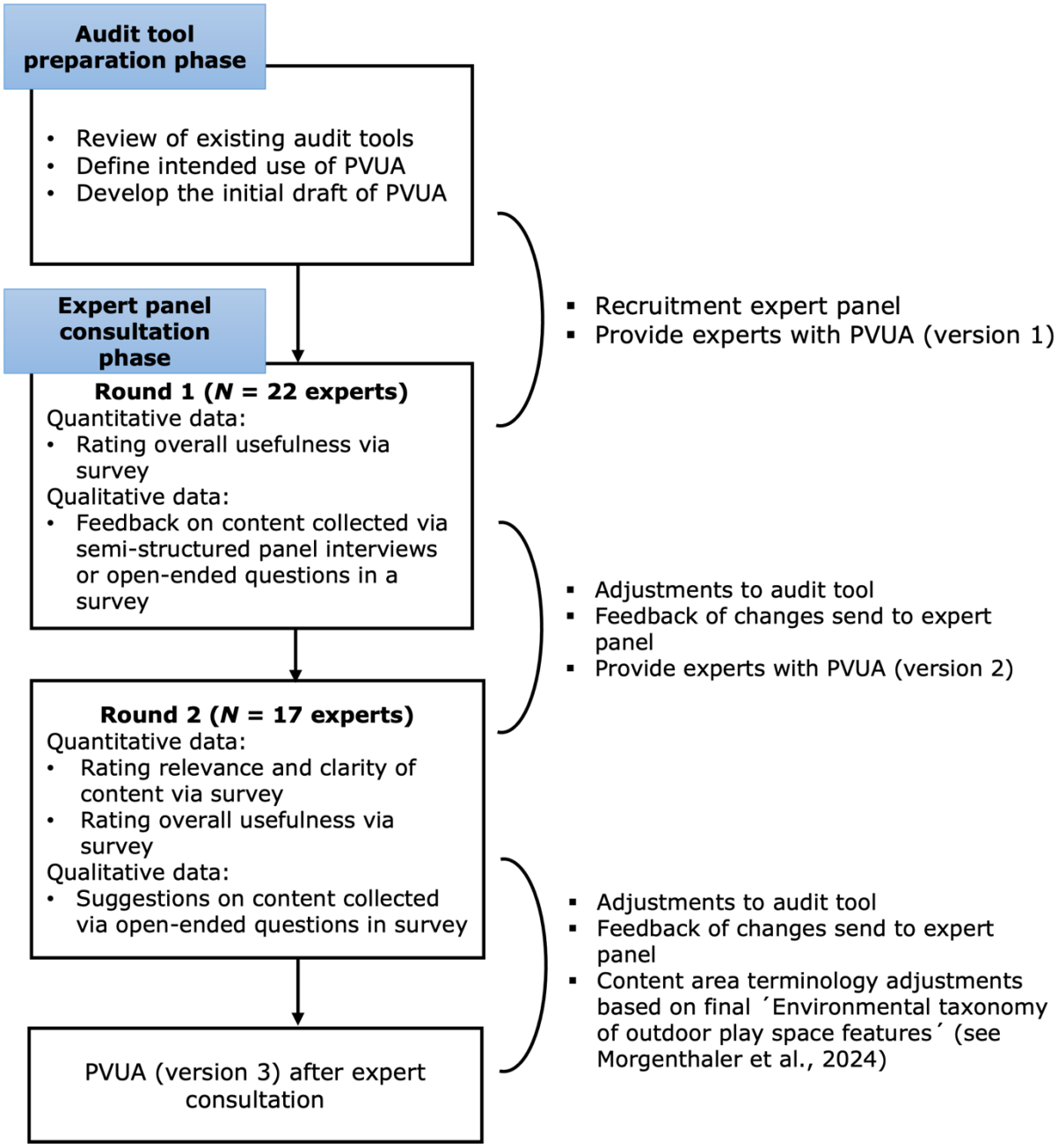
Designing playgrounds high in play value and usability is challenging, and evidence from children suggests there are substantial discrepancies between most designed playgrounds and children's own preferences and desires. Studies soliciting children's experiences of playgrounds have emphasized a lack of diversity in play opportunities (Horton & Kraftl, 2018; Jansson, 2008); a lack of novel opportunities within a playground over time (Caro et al., 2016; Jansson et al., 2016); limited choices that do not align with children's abilities (Burke, 2012; Lynch et al., 2020); few challenging play opportunities available, especially for older children and those with disabilities (Caro et al., 2016; Jansson et al., 2016; Lynch et al., 2020); and an absence of diverse features that afford interaction between children (Burke, 2012; Prellwitz & Skär, 2007). Another substantial challenge is that professionals responsible for playground provision often lack knowledge and experience necessary to cater to a diverse population, including children with disabilities (Moore et al., 2022; Sterman et al., 2019; Van Melik & Althuizen, 2022; Wenger, Prellwitz, et al., 2023). National reports from Germany, the United Kingdom (Wales and Scotland), and Ireland have described a lack of playgrounds suitable for children with disabilities and recommended improvement to cater better to this population (Dallimore, 2023; FitzGibbon & Dodd, 2023; Moloney et al., 2021; Weber et al., 2023). Thus, it is essential to enhance the provision for diverse populations while also considering high play value.

Playgrounds should aim to do more than just meet safety or accessibility standards; they should prioritize high play value and dynamic play opportunities that will cater to diverse users, including children with and without disabilities. This study addresses the need for an audit tool that can effectively assess the play value and usability of public playgrounds through the development and validation of the *Playground Play Value and Usability Audit Tool* (PVUA). Using such an audit tool supports an evidence-informed approach in managing and ensuring the provision of high-quality playgrounds that consider play value and usability.

Methods

The objective of this study was to develop and explore the preliminary evidence of validity of the test content of the Playground Play Value and Usability Audit tool (PVUA). Content validity refers to the representativeness of the test content (items and domains) and the construct it is intended to measure (AERA et al., 2014). Consequently, validity evidence based on test content supports how the test scores are interpreted (AERA et al., 2014). Protocols for developing a new research instrument place significant importance on the examination of content validity and require collection of existing evidence from literature, accompanied by empirical evidence solicited through expert evaluation (AERA et al. 2014; Sireci & Benítez, 2023). To develop and assess the content validity of the PVUA tool, this study was designed in two phases: (1) audit preparation and (2) expert consultation (Figure 1). The study was approved by the University College Cork Social Research Ethics Committee [Log 2022-190].

Figure 1. Flowchart of the study design



Audit Tool Preparation Phase

Review of Existing Audit Tools

Our process of instrument development started with a review of existing playground audit tools that capture play value, usability, and similar constructs, as well as an investigation into the content validity evidence of these tools. From a preliminary review of seven existing audit tools, test content differed significantly (for references, see Table 1). For example, four focus on play value or a related construct (playability) but lack emphasis on children with disabilities; two

concentrated on children with disabilities but lack details on play value; and only one tool claimed to consider both aspects but focused mainly on play equipment rather than features such as topography or loose parts. While the authors of these tools provide evidence of content validity (e.g., non-systematic literature reviews, expert consultations, and playground user feedback), none detailed how these sources influenced their tool formation or any adjustments the authors made based on the collected evidence. In summary, available audit tools did not capture play value as an overall construct for diverse users, and, consequently, we identified the need to develop a new audit tool that describes test content development and adjustment in detail.

Table 1. Summary of reviewed audit tools and their content

Name of Tool (Reference)	**Intended Use**	**Test Content in Domains** (Number of Items)	**Evidence Base of Test Content**	**Strengths (+) and Limitations (-)**
Playability Tool Kit (PTK) (Ontario Parks Association, 2001)	Evaluate playground playability	8 domains: arrival point (5), pathways (17), entrance to play space (5), play events (15), play space layout (7), surfacing (4), amenities (5), signage (6)	Expert opinions, children's and parent's perspectives	+ Is a grey literature tool but a modified version used in one research study (Yantzi et al., 2010) - No information on content validity provided - Mostly focused on accessibility but not usability and play value
Tool to Assess Play Value and Design of Play Spaces (Woolley & Lowe, 2013)	Assess the relationship between play value and design of play space	3 domains: play types (5), physical characteristics (13), environmental characteristics (5)	Literature review	+ Used in several research projects: (Bao et al., 2021; 2022; Cetken-Aktas & Sevimli-Celik, 2023; Kaştaş-Uzun & Dikmen-Güleryüz, 2024; Lynch et al., 2018) + Describes theoretical argument that underscores content validity - Only one item focused on diverse user groups
Play Space Quality Assessment Tool (PSQAT) (INSPIRE Consultancy Ltd. & Play England, 2009)	Measure the quality of dedicated play areas created by local authorities and others	3 domains: locations (7), play value (1), care and maintenance (7)	No information provided	+ Is a grey literature tool but was used in research (Jenkins et al., 2025; Taylor et al., 2008) + Intra-class correlation above 0.85 (excellent inter-rater reliability) (Jenkins et al., 2015) + Internal consistency reliability Cronbach alpha 0.8-0,9 (good to excellent) (Jenkins et al., 2015) - No information on content validity provided - Only one item focused on diverse user groups

PARC - Evaluation tool for assessing the accessibility and usability of community parks and playgrounds (Perry et al., 2018)	Assess accessibility and usability of parks and playgrounds across ages	6 domains: approachability to park parking and bus routes (10), path surfaces (10), play areas and equipment usability (65), rest areas (7), restrooms (13), drinking fountain (7)	Literature review, expert opinions, consultation with advocacy groups and city council members, pilot testing	+ Inter-rater reliability: Cohen's Kappa (k=0.9) indicated near perfect agreement (Perry et al., 2018) - Test content comprehensively developed but no information on content validity provided - Mostly focused on accessibility - Does not evaluate play value; focused on presence and absence of features
Brief Play Space Audit Tool (PSAT) (Gustat et al., 2020)	Assess playability based on presence and condition of playground features	5 domains: general playground overview (15), surface, terrain, vegetation (5) pathways and path segments (10) play equipment and structure (18)	Interview with caregiver on playground, revisions	+ Inter-rater reliability acceptable reliability with high kappa values between .79 and .90 for all items in domains (Gustat et al., 2020) - No information on content validity provided - Not looking at play value characteristics; focused on presence and absence of features - Not focused on diverse user groups
Play Park Evaluation Tool (PPET) (Parker & Al-Maiyah, 2022)	One aspect of the tool evaluates play value based on play types	Access, entrance(s) to play park, internal access, non-play equipment, play equipment, play value (19)	Literature review	+ Infographic makes it easy to identify what play opportunities are provided - No test criteria available - No information on content validity provided - Focuses on provided play equipment, not other features of playgrounds - Does not investigate environmental qualities; focused on presence and absence of features
Playground Rating System (FPRS) (Frost et al., 2001; cited in Olgan & Kahriman-Öztürk, 2011)	Not defined	3 domains what does the playground contain? (20), is the playground in good repair and relatively safe? (20), what should the playground do? (20)	No information provided	- No test criteria available - No information on content validity provided - Not focused on diverse user groups - Strong focus on safety

Defining the Intended Use of PVUA

We developed the PVUA to be an observer-rated evaluation of the environmental qualities of public playgrounds. The aim of PVUA is to evaluate a public playground's potential play value and usability by assessing the qualities and characteristics of the playground and their potential for supporting diverse play affordances and high-quality play experiences instead of simply providing an inventory of various playground features. The results of the audit can then be used to justify improvements or changes during a retrofitting or expansion process. The PVUA could potentially be used by various professionals, including outdoor play researchers, municipality leaders responsible for playground provision/

management, landscape architects, health professionals such as occupational therapists, and play advocates.

Developing the Initial Draft of PVUA

Conceptually, the PVUA draws on the perceptual theory of affordances, which explains how the environment may be perceived and used by children (Gibson, 1979; Heft, 1988). The theory of affordances underscores the relationship between the child and the environment and allows one to evaluate the physical environment for potential play affordances children may perceive and actualize (Gibson, 1979; Kyttä, 2002).

Two literature reviews (Morgenthaler et al., 2023, Morgenthaler et al., 2024) supported our audit item pool generation. Both reviews focused on synthesizing the available evidence on how the physical environment relates to or supports children's outdoor play on community playgrounds. First, a scoping review investigated the environmental qualities that enhance outdoor play experiences on playgrounds from the perspective of children, both with and without disabilities, aged between zero and 12 years (Morgenthaler et al., 2023). This review revealed that children want diverse play experiences, expressing a desire for fun, challenging, and intense motor and sensory play opportunities. Children also wish to direct their own play and want opportunities to play alone as well as in small and big groups. Furthermore, children want to feel secure and welcome in public playgrounds and feel that they belong in their community and the play space (Morgenthaler et al., 2023). The second review was a secondary analysis of a subset of research papers from the scoping review and established a taxonomy of playground features and their environmental characteristics that related to play affordances (Morgenthaler et al., 2024). While the preliminary taxonomy supported the underlying structure of the PVUA tool version 1, the final taxonomy supported the terminology we used in version 3.

The original 211 audit items generated from these reviews and the developed taxonomy were initially clustered by the primary author into two domains, five subdomains, and 26 content areas (Table 2). Domain 1 (Supporting Ecological Setting) includes items that influence play value and usability on a more general level. These items indirectly support play value and usability, which potentially contribute to making a playground experience meaningful for children and include characteristics such as playground location, season and weather, playground maintenance, seating, amenities, and fencing. Domain 1 is represented by two subdomains: context for play and supporting features. Domain 2 (Immediate Physical Environment That Potentially Affords Play Opportunities) includes items related to observable physical and physical-social environmental characteristics of playground features that support a variety of play affordances. Domain 2 is represented in three subdomains: spaces for play, play equipment, and objects for play.

Table 2. PVUA (Version 1)

Domain	Subdomain	Content Area	Number of Items
Domain 1: Supporting Ecological Setting	Context for play	Playground location in the community	7
		Aesthetics and maintenance of the playground	12
		Climate and weather	12
	Supporting features	Seating	12
		Fencing, boundaries, and entrances	11
		Amenities	3
Domain 2: Immediate Physical Environment Affording Play Opportunities	Spaces for play	Open space characteristics	5
		Path and walkway characteristics	11
		Topography (includes hills and slopes for play)	10
		Natural environments	10
		Enclosed and smaller spaces	8
		Sport fields	5
	Play equipment	Swinging	13
		Spinning	9
		Sliding	12
		Climbing	15
		Jumping on/off	4
		Balancing and crossing	9
		Rocking	5
		Zipline	4
		Recognizable play structures and objects	4
		Flow and arrangement of play equipment	3
	Objects for play	Manufactured play objects and tools	3
		Musical and visual play opportunities	4
		Provided loose materials for play	11
		Natural loose materials and objects	9

Expert Panel Consultation Phase

Recruiting an International and Interdisciplinary Expert Panel

To effectively assess the content validity of the PVUA domains, content areas, and items, we convened a panel of experts. All panelists were purposefully recruited to provide the necessary depth and diversity of experience and knowledge to comprehensively assess and help refine the audit tool (AERA et al., 2014; Keeney et al., 2011; Nasa et al., 2021). For this study, eligible experts needed to have professional experience related to playground design or evaluation in children's outdoor play; experience with children and families with and/or without disabilities; and sufficient time to participate. We identified experts through the research team consortium or are known experts in the field (e.g., published authors). Recruitment aimed to target a diverse sample of professionals, including play researchers, play advocates, and expert practitioners, such as those working with families and children.

We invited 42 experts via email and informed them about the study through a leaflet and a pre-recorded video. Of the 34 experts who replied, ten declined participation because of the time commitment. Before starting the first round, two

more experts retracted their participation. The final review panel was thus comprised of 22 experts.

Data Collection

In round 1 of the expert panel consultation, we collected both quantitative and qualitative data through three mechanisms. First, we collected demographic information in a short survey. Second, to collect feedback on the PVUA (version 1), experts could opt to either complete an online survey with open-ended questions or participate in semi-structured online interviews with the primary author. Twenty-one experts participated in semi-structured interviews, and one chose the survey. The semi-structured interviews used a piloted interview guide that included guiding questions and brief presentations on the audit tool. Interviews were loosely structured and allowed experts to provide feedback related to their areas of expertise. Where the content of audit items was unclear or missing, experts were prompted to suggest possible adjustments, such as rephrasing, or to elaborate on what they felt should change. Discussions between the first author and the panelist led to clarifications. This approach supported a shared understanding of why items were generated while helping solicit more detailed insights from experts on new or revised content. Semi-structured interviews were carried out using Microsoft Teams video and audio functions; transcripts were automatically produced via Teams. Third, following the interview, each expert was asked to comment on the overall utility the PVUA tool (version 1) through a one-question survey using a four-point scale from very useful to not useful at all.

In round 2, we provided all panelists with the revised PVUA tool (version 2) and a summary of the changes. Seventeen experts evaluated content relevance and clarity of the revised PVUA (version 2) through an online survey. Both quantitative and qualitative (open-ended) data were collected. First, experts rated all content areas for both relevance and clarity using a three-point scale (Relevance: 1 = *very relevant*; 2 = *somewhat relevant*; 3 = *not relevant at all*; Clarity: 1 = *yes, very easy to understand*; 2 = *no, could be clearer*; 3 = *no, not clear at all*). Open-ended questions prompted experts to suggest missing content, indicate redundant content, or suggest revisions to make content clearer. After rating all content areas, experts were again asked to rate the overall utility of the revised audit tool (using the same question and response options as the first round).

Before disseminating the survey questions for both rounds, we conducted pilot cognitive interviews with nine individuals, including topic experts and non-experts, to ensure the questions were appropriate and clear.

Data Analysis

We performed quantitative data analysis on the relevance and clarity ratings from round 2 as well as overall utility ratings from both rounds 1 and 2 with the goal of assessing levels of expert agreement. The level of agreement was quantified by percentage, following the recommendations of von der Gracht (2012). In this study, we set a sufficient level of agreement to a threshold of 70% or higher in relevance and clarity ratings *(*Diamond et al., 2014). In case of lower than 70% relevance and clarity ratings, the experts' suggestions from open-ended questions guided content revisions. Removal of single items or entire content areas occurred for low

agreement ratings and when no improvements based on experts' suggestions were feasible.

To analyze the one question we administered in rounds 1 and 2 to assess the stability in agreement regarding the overall utility of the audit tool, we used the Wilcoxon Signed-Rank test (von der Gracht, 2012). Stability was considered achieved when no statistically significant differences in overall utility ratings between rounds 1 and 2 were found, which supported our decision to conclude the consultation phase (von der Gracht, 2012). Data analysis was performed using the Statistical Package for the Social Sciences version 28 (IBM Corp, 2021). The significant level was set to 0.05 for all statistical tests.

We conducted qualitative data analysis through directed content analysis (Hsieh & Shannon, 2005). This method was chosen because the aim was to further extend and clarify an already existing framework or theory, in this case, the revision of the PVUA tool (Hsieh & Shannon, 2005). We conducted content analysis for each round separately, using the transcriptions of semi-structured interviews from round 1 and the open-ended survey questions from round 2. Content analysis in both rounds started with reading the transcripts or the answers to open-ended questions, followed by extracting relevant information and open coding (Hsieh & Shannon, 2005). The codes were grouped according to experts' suggestions regarding the content areas of the audit tool. The next step involved reading the grouped codes to identify levels of expert agreement and proposed suggestions for change. We used this information to rephrase items, content areas, and domains, make changes in the proposed audit scale and instructions, and delete or generate new items. Adjustments were made based on suggestions from one or several experts. In the case of conflicting suggestions, the research team decided on the most suitable adjustment through discussions. See Appendix A for a numerical analysis of content changes from PVUA version 1 to 3.

Some experts' suggestions did not refer to specific item content but noted how a global and interdisciplinary group of experts might interpret PVUA test content. These experts' suggestions were extracted from both rounds and clustered into three topic summaries as guidance for potential interpretation of test content and further development considerations of the PVUA tool.

Results[1]

Based on the two expert panel rounds, the results of this study are twofold. First, panelist feedback supported refinements to the test content of the PVUA. Second, the panelists provided valuable insights into how future users may potentially interpret the test content. The presentation of the results begins with a description of the expert panel, followed by an outline of the refinements made to the test content using both quantitative and qualitative data, and concludes with a summary of three key insights into the test content interpretation.

[1] The data supporting this study's findings are openly available in Zenodo at https://doi.org/10.5281/zenodo.13861628.

Expert Panel Description

The study involved 22 experts; their mean age was 56 years and 64% were female (see Table 3). More than half (59%) of the participating experts were from Europe, followed by North America (27%) and Australia (14%).

Panelists' expertise on the study topic ranged from eight to 37 years with a mean of 22.9 years. They gained their knowledge through research (*n* = 19), consultation (*n* = 16), and practice (*n* = 14). Their research topics included playground provision, inclusive play, and child-friendly urban planning. Participants' consultation involved working with equipment providers and policy stakeholders and promoting inclusive design solutions. Practical experience was gained by working with children, parents, and communities.

Experts reported on their expertise in instrument use and development. Three experts regularly use environmental instruments such as play-sufficiency audits, risk-benefit audits, or playground-safety audits; six experts supported developments of environmental audits/assessments; four experts developed clinical assessments and had experience in test statistics; and two experts developed instruments eliciting user perspectives. Five experts had no expertise in instrument development/use.

Table 3. Characteristics of expert panelists

Panelist characteristics		*N* = 22 *n* (%)
Age		
	Mean [SD]	55.6 [9.3]
	Range	38 - 74
Sex		
	Female	14 (64)
	Male	8 (36)
Country of Residence		
	Australia and New Zealand	3 (14)
	Europe	13 (59)
	North America	6 (27)
Native Language		
	English	15 (68)
	German	2 (9)
	Dutch	2 (9)
	Swedish	1 (4)
	Danish	1 (4)
	French	1 (4)
	Bilingual	10 (45)
Professional Background (Multiple Answers)		
	Research and/or academia	16 (73)
	Occupational therapy	6 (27)
	Physical therapy	1 (5)
	Landscape architecture or interior design	3 (14)
	Playwork	3 (14)
	Education	2 (9)
	Independent play consulting	3 (14)

	Nongovernmental organization work	1 (5)
	Not specified (practitioner)	2 (9)
Years of Experience with Outdoor Play		
	Mean [SD]	22.9 [8.1]
	Range	8 - 37

Refinements of the PVUA Content in Rounds 1 and 2

In round 1, 22 experts evaluated the test content of the PVUA (version 1)**.** Experts provided 396 suggestions, which, in turn, supported a revised item pool of 221 items divided into 30 content areas (Table 4, PVUA version 2). Major adjustments included an adoption of descriptions for each content area. Experts argued that descriptions provide users with an understanding of the content area and direct them to the play value and usability characteristics within each content area. For example, the description for content area "climate, weather, and season adaptability" would read: "climate, weather, and seasons provide new play opportunities and are linked to environmental qualities that support an enjoyable playground visit (e. g., shade provision)." For "Management and Maintenance" the description would read: "considerations that cater to secure and playable environments that not only focus on safety management, but also create play opportunities through management activities (e.g., not cutting vegetation too extensively)." Furthermore, experts suggested renaming 13 content areas to better capture the item content (e.g., "spinning" was broadened to "turning, spinning, and rotation"). Four new content areas were formed: "character of the playground," "sensory space-related qualities," "signage (orientation and rules)," and "auditory play opportunities"—either because experts proposed relocating items or suggested new items.

Most of the 44 new items proposed by experts were for "Domain 1: Supporting Ecological Setting" (n = 29) compared to "Domain 2: Immediate Physical Environment Affording Play Opportunities" (n = 15). This led to the extensive development of Domain 1. A total of 34 items were deleted due to redundancy (n = 22) or merged with another item (n = 12). All items were minimally revised based on new instructional questions and response options proposed by the experts. Additionally, 40 items underwent rephrasing to clarify meaning when proposed items were questioned by experts, such as items related to color: "I don't think color contributes to play value" (inclusive play researcher) or items related to walkability to the playground location: "…depends on who is walking" (landscape architect).

Table 4. Version history of PVUA domains, sub-domains, content areas, and number of items

PVUA (Version 2)				PVUA (Version 3) after Expert Consultation		
	Subdomain	**Content Area**	**Items**	**Subdomain**	**Content area**	**Items**
Domain 1: **Supporting ecological setting**	Contextual features of playground	Character of the playground[+]	8	Contextual supporting considerations of the playground	Development and character of the playground[*]	7
		Playground location in the community	9		Playground location[*]	10
		Management and maintenance[*]	5		Management and maintenance	7
		Sensory space-related qualities[+]	9		Sensory space-related qualities	4
		Climate/weather and season adaptability[*]	10		Climate, weather, and season adaptability	10
	Physical supporting features of the playground	Signage (orientation and rules) [+]	9	Physical supporting features of the playground	Signage (orientation and rules)	9
		Seating (formal and informal) [*]	9		Seating (formal and informal)	6
		Fencing, boundaries, and entrances	11		Fencing, boundaries, and entrances	11
		Amenities (toilets, water fountains) [*]	3		Amenities (toilets, water fountains)	3
Domain 2: **Immediate physical environment affording play opportunities**	Spaces for play	Open space characteristics	4	Play opportunities by space	Open space characteristics for play[*]	3
		Path and walkway characteristics	8		Path and walkway characteristics for play[*]	8
		Topography (includes hills, slopes, and depressions for play)	9		Topographic features for play (includes hills, slopes, and depressions)[*]	5
		Natural environment	10		Fixed Natural features for play[*]	10
		Enclosed and smaller spaces	9		Enclosed and bounded spaces for play[*]	8
		Designated sport areas[*]	5		Designated sport areas	5
	Play opportunities provided by play equipment	Swinging	12	Play opportunities by play equipment	Swinging	12
		Turning, spinning, and rotating[*]	9		Turning, spinning, and rotating	9
		Sliding	10		Sliding	10
		Climbing (and hanging) [*]	15		Climbing (and hanging)	14
		Jumping on/off	4		Jumping on/off	4
		Balancing and crossing	7		Balancing and crossing	7
		Rocking	5		Rocking	5
		Cable ways[*]	4		Cable ways	6
		Recognizable and less recognizable play structures and fixed objects[*]	3		Recognizable and less recognizable play structures and fixed objects	2
		Flow and arrangement of play opportunities	6		DELETED	
	Loose parts and objects for play	Manufactured loose parts and tools[*]	3	Play opportunities by loose parts and materials	Manufactured loose parts, tools, toys, and ride-on play opportunities[*]	4
		Visual play opportunities[*]	2		DELETED	

		Auditory play opportunities+	6			Auditory play opportunities	6
		Loose materials provided for play*	9			Malleable materials provided for play*	10
		Natural loose materials and parts*	8			Loose natural parts and wildlife*	8

Notes: **+** indicates new content area formed in round 1 and 2. ***** indicates name adjustment of content area in round 1 and 2.

In round 2, 17 experts provided relevance and clarity ratings. Overall, experts found content areas relevant to include (*very relevant* and *somewhat relevant*) while rarely suggesting excluding content (*not relevant*) (Table 5). Similarly, most experts found the content *very clear* or *somewhat clear.* Very seldom did experts rate content areas as *not clear at all*. When comparing relevance or clarity, agreement ratings consistently surpassed disagreement ratings across all content areas, indicating a convincing agreement among experts.

Out of 316 proposed experts' suggestions from open-ended questions, we used 196, resulting in 158 content adjustments and a final of 203 items divided into 28 content areas in version 3 of the PVUA (Table 4, Version 3). Adjustments aimed to enhance the clarity of 36 items, condense six items, provide more details to 11 items, and make minor adjustments to 40 items, while preserving the original meaning. We omitted suggestions from experts when they were too general, failed to provide enough detail for refinement, or conflicted with suggestions from other experts.

Ten out of 30 proposed content areas fell below the 70% agreement threshold (Table 5). Two content areas were deleted due to very low relevancy and clarity ratings: "flow and arrangement of play opportunities" (relevancy: 52.9%, clarity: 47.1%) and "visual play opportunities" (relevancy: 47.1%, clarity: 52.9%). Several experts said both were redundant and difficult to audit. The other seven content areas with low agreement ratings were adjusted based on experts' suggestions, or other explanations of low ratings were found. For example, "open space characteristics for play" (relevance: 52.9%, clarity: 41.2%) received low ratings because experts prioritized varied topography (relevance: 82.3%, clarity 76.4%) as more important for play than open spaces. Four experts were unsure if open space characteristics such as "mostly flat" should be considered a "good thing or a bad thing" (play researcher), were perceived as "a bit boring" (landscape architect), or emphasized that "hills and inclinations are important features for play" (occupational therapist, play equipment provider). Similarly, "recognizable and less recognizable play structures and fixed objects" (relevance: 52.9%, clarity: 70.5%) received low relevance ratings. This was critiqued by experts as something that "takes away the imagination" (occupational therapist), "should not just be decoration" (inclusive play advocate), or "tries to teach children things" (landscape architect). This suggested that items should be removed; however, these items were kept in the PVUA tool because experts also pointed out they might still be relevant for some children. One expert expressed: "[for] quite a few children with intellectual disabilities, it is good if there are very recognizable elements in a playground. …That helps them get into the game" (inclusive play advocate). Similarly, the content area of "fencing, boundaries, and entrances" (relevance: 64.7%, clarity 64.7%) fell below the 70% threshold, and experts emphasized that,

for some user groups, enclosures were more relevant than for others (e.g., children who tend to run away; families with several children with different abilities/ages). For the fencing and boundaries items, experts asked to consider whether fencing is suitable for a playground based on its location.

Overall Utility Rating: Rounds 1 and 2

In both rounds, we administered one question to examine the overall utility of the PVUA content. In round 1, 20 of 22 experts rated the overall utility with a median of 2 (*somewhat useful*) ranging from 1 (*very useful*) to 4 (*not useful at all*). In round 2, 16 of 17 experts provided a rating of the overall utility with a median of 1 (*very useful*) ranging from 1 (*very useful*) to 3 (*a little bit useful*). We used the Wilcoxon signed rank test to evaluate the stability of responses; no statistical significance was found in the difference of the overall utility ratings from round 1 to 2 (z = 1.134, N-Ties = 7, p = .257). A non-statistically significant difference indicated a stable response and a justification for stopping with the second round.

Table 5. Frequency and percentage of relevance and clarity of content areas: Round 2 (*N* =17)

	Content Areas Version 2	**Relevance Ratings**				**Clarity Ratings**			
		Very relevant	Somewhat relevant	Not relevant	Missing	Very clear	Could be clearer	Not clear	Missing
Domain 1	**Subdomain: Contextual: Supporting Considerations of the Playground**								
	Character of the playground	11 (64.7)	5 (29.4)	1 (5.9)	0	10 (58.8)	6 (35.3)	0	1 (5.9)
	Playground location in the community	13 (76.5)	4 (23.5)	0	0	11 (64.7)	5 (29.4)	0	1 (5.9)
	Management and maintenance	15 (88.2)	2 (11.8)	0	0	11 (64.7)	6 (35.3)	0	0
	Sensory space-related qualities	12 (70.6)	4 (23.5)	1 (5.9)	0	11 (64.7)	5 (29.4)	0	1 (5.9)
	Climate, weather, and season adaptability	13 (76.5)	2 (11.8)	1 (5.9)	1 (5.9)	8 (47.1)	8 (47.1)	0	1 (5.8)
	Subdomain: Physical: Supporting Features of the Playground								
	Signage (orientation and rules)	12 (70.6)	3 (17.6)	2 (11.8)	0	12 (70.6)	4 (23.5)	0	1 (5.9)
	Seating (formal and informal seating)	13 (76.5)	3 (17.6)	1 (5.9)	0	11 (64.7)	5 (29.4)	0	1 (5.9)
	Fencing, boundaries, and entrances	11 (64.7)	6 (35.3)	0	0	11 (64.7)	4 (23.5)	1 (5.9)	1 (5.9)
	Amenities (toilets, water fountains)	13 (76.5)	3 (17.6)	1 (5.9)	0	12 (70.6)	3 (17.6)	0	2 (11.8)

Table 5, cont.

Domain 2	**Subdomain: Play Opportunities by Spaces**								
	Open space characteristics for play	9 (52.9)	5 (29.4)	2 (11.8)	1 (5.9)	7 (41.2)	7 (41.2)	0	3 (17.6)
	Path and walkway characteristics for play	11 (64.7)	3 (17.6)	2 (11.8)	1 (5.9)	12 (70.6)	3 (17.6)	0	2 (11.8)
	Topography for play (includes hills, slopes, and depressions for play)	14 (82.3)	1 (5.9)	1 (5.9)	1 (5.9)	13 (76.4)	2 (11.8)	0	2 (11.8)
	Natural environment for play	15 (88.2)	1 (5.9)	0	1 (5.9)	8 (47.1)	7 (41.2)	0	2 (11.7)
	Enclosed and smaller spaces for play	13 (76.5)	2 (11.8)	1 (5.9)	1 (5.9)	11 (64.7)	4 (23.5)	0	2 (11.8)
	Designated sport areas	13 (76.4)	2 (11.8)	1 (5.9)	1 (5.9)	12 (70.6)	3 (17.6)	0	2 (11.8)
	Subdomain: Play Opportunities by Play Equipment								
	Swinging opportunities	11 (64.7)	4 (23.5)	0	2 (11.8)	12 (70.6)	3 (17.6)	0	2 (11.8)
	Turning, spinning, and rotating opportunities	12 (70.6)	3 (17.6)	1 (5.9)	1 (5.9)	13 (76.4)	2 (11.8)	0	2 (11.8)
	Sliding opportunities	11 (64.7)	4 (23.5)	1 (5.9)	1 (5.9)	14 (82.3)	1 (5.9)	0	2 (11.8)
	Climbing (and hanging on) opportunities	13 (76.4)	2 (11.8)	1 (5.9)	1 (5.9)	14 (82.3)	1 (5.9)	0	2 (11.8)
	Jumping on/off opportunities	12 (70.6)	3 (17.6)	1 (5.9)	1 (5.9)	15 (88.2)	0	0	2 (11.8)
	Balancing and crossing opportunities	13 (76.4)	2 (11.8)	1 (5.9)	1 (5.9)	14 (82.3)	1 (5.9)	0	2 (11.8)
	Rocking opportunities	12 (70.6)	3 (17.6)	1 (5.9)	1 (5.9)	14 (82.3)	1 (5.9)	0	2 (11.8)
	Cable ways opportunities	10 (58.8)	5 (29.4)	1 (5.9)	1 (5.9)	11 (64.7)	3 (17.6)	1 (5.9)	2 (11.8)
	Recognizable and less recognizable play structures and fixed objects	9 (52.9)	5 (29.4)	2 (11.8)	1 (5.9)	12 (70.5)	2 (11.8)	1 (5.9)	2 (11.8)
	Flow and arrangement of play opportunities	9 (52.9)	6 (35.3)	1 (5.9)	1 (5.9)	8 (47.1)	6 (35.3)	1 (5.9)	2 (11.8)
	Subdomain: Play Opportunities by Loose Parts and Materials								
	Manufactured loose parts and tools	12 (70.6)	3 (17.6)	1 (5.9)	1 (5.9)	12 (70.6)	3 (17.6)	0	2 (11.8)
	Visual play opportunities	8 (47.1)	6 (35.5)	2 (11.8)	1 (5.9)	9 (52.9)	6 (35.3)	0	2 (11.8)

	Auditory play opportunities	13 (76.4)	1 (5.9)	2 (11.8)	1 (5.9)	12 (70.6)	3 (17.6)	0	2 (11.8)
	Loose materials provided for play	15 (88.2)	0	1 (5.9)	1 (5.9)	10 (58.8)	5 (29.4)	0	2 (11.8)
	Natural loose parts and wildlife	14 (82.3)	1 (5.9)	1 (5.9)	1 (5.9)	12 (70.6)	3 (17.6)	0	2 (11.8)

Experts' Insights into Test Content Interpretation

This study compiled insights from an international, interdisciplinary expert panel. These insights revealed varying perspectives among experts but enhanced potential interpretation of the test content. Below, we summarize three key insights gathered from both rounds.

Country-Specific Policies and Playground Standards Influence Play Value Perspectives

The international expert panel's recommendations were based on participants' country-specific contexts, which differed for each expert. Experts noted that potential users of the PVUA tool will also have specific frames of reference, such as country-specific common practices of playground provision or country-specific policies and playground standards guiding playground provision. For example, experts from the Netherlands, Sweden, Germany, and Switzerland indicated that fixed natural features, natural loose parts, and malleable materials for play are common practice in their countries and relevant for play value. However, in the USA and Australia, similar provisions would be considered potential tripping hazards, prone to accidental ingestion by children, or sources of disease:

> *In the United States… loose parts are not permitted on playgrounds due to safety concerns. Sand, water, and mud play are also not permitted on playgrounds due to their potential for various health hazards (e.g., hand, foot, and mouth disease; animal feces)* (inclusive playground researcher).

Similarly, experts from the USA and UK noted that smaller, house-like spaces might be prohibited for safety reasons. Such restrictions based on country or city policies were grounded in the rationale that children might get trapped when facing potential bullies/predators, or that those spaces are misused by drug users or homeless persons. Users of the PVUA need to be aware of such country-specific frames of references that may influence how they will score items.

Geographic Location Influences Playground Provision

Experts also elaborated on geography-specific content related to climate, weather, and season. Depending on an expert's geographic location, the relevance of provisions to protect against weather conditions such as rain and wind or sun and shade differed substantially. For instance, while some experts emphasized the importance of shade in all playgrounds, others argued that provisions should be appropriate for local weather conditions:

> *…dominant winds coming from the northeast, then you want a shelter with the back on it first in northeast, it's all of those kinds of things that… nobody seems to care about* (independent play consultant).

Similar to weather and climate, light conditions based on time of day and season were noted as dependent on geographic location. Experts noted adequate lighting as important in locations with long winters, as darkness affects children's outdoor playtime and the usability of playgrounds as meeting places for older children. Other experts argued lightning "leads to an artificial environment" (play researcher) and is unnecessary because children use playgrounds during daytime. Therefore, the relative importance of content regarding weather, climate, and season-related items may vary by location.

Usable for Some, but Not for All

The panel emphasized the need for playgrounds to cater to users of all ages, abilities, and genders, including families as well as children visiting the playground independently. Experts recognized the challenge of accommodating diverse users with varying needs but acknowledged that not all features need to be provided in all playgrounds. For instance, restrooms are significant for families, children with disabilities, pregnant or breastfeeding women, younger children, and teenage girls, which were described as a substantial portion of potential playground users. Accessible, clean restrooms with adult-sized changing tables would accommodate these users. Similarly, seven experts highlighted fences, enclosures, and lockable gates as beneficial for families with young children or children who tend to wander off:

> *If there is no fence around the playground, these caregivers cannot sit quietly for a moment. They must watch constantly. The children do not get to play, and the caregivers do not get to rest* (inclusive play advocate).

However, restrooms or fencing were described by some experts as non-essential features of playgrounds. For example, a playground located in a neighborhood close to where users live might not need restrooms. Similarly, experts were concerned about the overuse of fences due to societal fears of children running away or getting bitten by dogs. Experts understood that fencing is useful for some users and that examining playground provisions from a neighborhood perspective might be more appropriate:

> *…it comes back to a… neighborhood perspective that you don't want to then say okay... every playground in a neighborhood has to be bounded... there should be some spaces within a neighborhood that provide that level of enclosure* (independent play consultant).

Other features might be useful for some users, including sufficient and diverse seating, or playground location within a community; how playgrounds are accessed (walking, biking, or driving) may also be significant for some users. In using this audit tool, it is crucial to interpret the results in relation to the needs of the specific community in which the playground is located. Additionally, while the unit of analysis of the PVUA is a single playground, all playgrounds in one community can be evaluated, as different playgrounds can serve different users.

Discussion

The objective of this study was to develop and then explore the preliminary evidence of validity in relation to the test content of the PVUA tool using quantitative and qualitative expert judgement of appropriateness, relevance, and comprehensiveness of the test content. The main results include the preliminary content validity evidence of the PVUA (version 3) item pool of 203 items, spread over 28 content areas, five sub-domains, and two domains attempting to capture environmental qualities describing play value and usability of playgrounds.

Through a two-round iterative process of feedback and revisions, experts evaluated the PVUA tool content validity. The strength of this study lies in using quantitative and qualitative data to refine content, including adding missing content, rephrasing existing content, aligning instructions, and scoring text. Standards for test development described evaluating content validity of new instruments as an invaluable first step, supporting the interpretation of test scores for their intended use (AERA et al., 2014). Almanasreh et al. (2019) note that content-based validity is frequently not documented, potentially compromising the quality of instruments and their use. Taylor et al. (2023) commented on this lack of validity evidence in the development of existing playground audit tools. While our study provided preliminary evidence of content validity, future research on the PVUA tool needs to examine other facets of validity, including response processes, internal structure, relation to other variables, and testing of consequences (AERA et al., 2014).

Evaluating the content of a new tool is a delicate process of balancing diverse expert perspectives while maintaining the tool's intended purpose (Schulze et al., 2013). A panel of 22 international experts from various professions participated in our study, and agreement on audit adjustments was rarely unanimous. Two possible reasons explain this divergence. First, experts from different disciplines prioritized different topics. For example, those specialized in inclusive play tended to prioritize accessibility and usability; those with expertise in child-friendly city planning emphasized access to playgrounds; and those with landscaping or horticulture expertise prioritized nature and biodiversity. Second, experts considered context-specific knowledge from the perspective of their own countries, including common playground practices (e.g., critique of contemporary playgrounds or endorsement of naturalized playgrounds), playground standards (e.g., policies for accessible playgrounds or safety regulations), or social discourses on outdoor play and playgrounds (e.g., children running away). Both reasons explain, in part, why experts did not always agree on the relevance of individual items. Other research on the topic of playgrounds reinforces the fact that finding common ground among a diverse panel of experts is difficult (Lynch et al., 2020; Sterman et al., 2019) but valuable to achieve, potentially enhancing playground provision for diverse users (Karaba Bäckström et al., 2024). For example, Wenger et al.'s (2023) study on inclusive playground provision revealed that experts emphasized the necessity of drawing insights from diverse disciplines, recognizing the value of knowledge of a consortium of different disciplines. Playgrounds and outdoor play represent an interdisciplinary topic in practice and research (Martin et al., 2023); thus, tools like this one serve as valuable starting points for cross-disciplinary collaboration.

Gathering validity evidence based on test content supports the interpretation of test scores, and subsequently guides how a tool will be utilized (AERA et al., 2014; Sireci, 2016). Experts expressed concerns about potential misinterpretations, such as how a playground's size might influence scores, with smaller playgrounds potentially scoring lower than larger ones. While play value and size appears to be a problem identified before by Woolley and Lowe (2013), the experts in this study provided insights on why careful interpretation is necessary. Experts suggested that if smaller playgrounds scored poorly, they may be replaced with fewer, larger playgrounds. This would be an undesirable outcome of using the PVUA tool. Such trends could be explained by the lower maintenance costs and time associated with fewer but larger playgrounds and the need for municipalities to optimize fund allocation (Randrup et al., 2021; Schneider & Jansson, 2023). Smaller playgrounds may be valued for different aspects beyond variety of play affordances. Factors such as easy access due to proximity to residential areas, less crowding, and less sensory overstimulation are all values expressed by parents in previous research (Refshauge et al., 2012; Sterman et al., 2019). These aspects are considered in the PVUA items that capture more ecological factors. Future validity testing of the PVUA tool should consider test interpretations related to ecological factors that might moderate a playground's play value.

While the PVUA tool evaluates potential play value and usability based on a visual inspection of characteristics in the physical environment, it lacks the subjective and experiential components of the play value construct. Supplemental to PVUA tool, qualitative approaches such as interviewing children about their play preferences or systematic play observations of children might be useful for capturing the more experiential aspects of play value (Morgenthaler, 2025). Zallio and Clarkson (2021) recommend such holistic, mixed-method approaches to evaluate the physical environment with audits and subjective measures of user experience. Using additional subjective measures provides a better understanding of actualized play affordances and high-quality play experiences of the playground, whether they meet children's play preferences, and whether environmental qualities are usable for a particular user group. Previous case studies have used mixed methods in their evaluation of playgrounds (Lynch et al., 2018; Refshauge et al., 2015); however, no validated audit tools were used in these studies. Therefore, future research should utilize a set of validated tools that support evaluation of play value and usability of public playgrounds.

Limitations

This study had some limitations based on the complexity of developing a new instrument and exploring content validity. First, no experts from geographical locations in Africa, South America, or Asia participated in the panel, despite concerted efforts to recruit from those regions. Second, most experts indicated their expertise from play research, with a limited number of experts having practical experience. Future research should focus on including practitioner perspectives on the audit tool to gain a better insight into its practicability. Third, ratings of relevance and clarity (round 2) were given to content areas but not individual items. This led to leaving out calculations such as the Content Validity Index for individual items, which would provide more nuanced agreement ratings (e.g. Almanasreh et al., 2019). Rating the large number of individual items was

considered too time-consuming for participants. Instead, the use of additional open-ended questions allowed experts to suggest adjustments for specific items. Finally, despite high agreement within the second expert review, a third round could have solidified adjustments and resolved ambiguities.

Conclusions

This study evaluated preliminary content validity based on the test content of the PVUA tool, a new audit tool designed to measure both the potential play value and usability of playgrounds. The content validity was developed from evidence literature and the preliminary content validity was further explored through an iterative consultation with an expert panel. To our knowledge, this is the first audit that integrates both aspects of play value and usability in one tool. However, this tool is still in its preliminary stage and requires further validation and refinement. Future studies should utilize the PVUA tool with a large and diverse sample of playgrounds to examine its reliability and construct validity.

Acknowledgement

We want to thank all the experts who provided valuable feedback: Anita Bundy, Ann Kennedy-Behr, Ben Tawil, Carlo Fabian, Eric Schmidt, Harry Harbottle, Heather Kuhaneck, Ilse van der Put, Ingrid M. Kanics, Jenene Burke, Jeanette Fich Jespersen, Joanne Coughlan, Julia Sterman, Justin Wilson, Manon Bloemen, Märit Jansson, Peter Höfflin, Ted Brown, Theresa Casey, Tim Gill, Tina Stanton-Chapman and as well as other experts who wished to be anonymous. Furthermore, we would like to thank the project partner Stichting voor het Gehandicapte Kind in the Netherlands, Elena Malcov, Sophie Ulbrich-Ford, Rianne Jansens, Karin Morgenthaler, Ulrike Muggi, Lena Sauerzopf, Maggie Ruth Morton, Beate Domänig, Allison Mula, and second-year students at UCC fall 2022 for supporting this work. This research was funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 861257.

Dr. Thomas Morgenthaler *has recently graduated with a Ph.D. in Occupational Science from University College Cork, Ireland and Queen Margaret University, Edinburgh, Scotland. His Ph.D. research focuses on developing instruments to investigate the environmental qualities of school and public playgrounds, aiming to provide capacity-building tools to communities that support maintaining high-quality play spaces. Thomas is an occupational therapist and preschool teacher trained in Austria.*

Dr. Janet Loebach *is the Evalyn Edwards Milman Assistant Professor in Child Development in the Department of Human Centered Design at Cornell University. Dr. Loebach also serves as the Chair of the Children, Youth & Environments Network of the Environmental Design Research Association, and on the Editorial Board of the journals* Children, Youth and Environments*,* Cities & Health *and* PsyEcology*. She is also the lead editor of the* Routledge Handbook of Designing Public Places for Young People: Processes, Practices and Policies for Youth Inclusion*.*

Dr. Helen Lynch, *P4play and University College Cork, Ireland, is a play researcher and advocate, and qualified occupational therapist, specializing in working with children with disabilities, families and communities. She has been engaged for many*

years in a research program concerning inclusive childhood play environments, and the rights of children to play. She has coauthored over 55 papers, 12 chapters and presented at many conferences internationally. She has been Principle Investigator on several research projects from Ireland and Europe including the Irish Research Council; National Disability Authority, Ireland; and EU Horizon2020 P4play, and is a member of the steering committee for Cork Child Friendly Cities, and currently chair of the International Play Association, Ireland branch.

Dr. Duncan Pentland *is Head of the Division of Occupational Therapy and Arts Therapies in the School of Health Sciences at Queen Margaret University, Edinburgh. He is a Member of the Royal College of Occupational Therapists, the Centre for Person-centred Practice Research, and the Start for Future cooperative. His research and scholarship includes using systems theories to understand and improve practice in health and social care.*

Dr. Anders Kottorp*, Ph.D., OT reg, is professor in Occupational Therapy and dean at Malmoe University, Malmoe, Sweden. He is also affiliated to Zurich University of Applied Sciences (ZHAW), Winterthur, Switzerland, and the Karolinska Institutet, Stockholm, Sweden. His academic expertise as educator, researcher, and scholar covers a wide span of inter-disciplinary research areas often in an international perspective; specifically targeting systematic evaluation and intervention in everyday functioning in both home and community for clients with a variety of functional limitations across the whole life span.*

Dr. Christina Schulze *is Professor in the Institute of Occupational Science and Therapy at Zurich University of Applied Sciences. Her research draws on qualitative and quantitative methodologies and focuses on the ways communities actively promote children health and development through participation in shared occupation.*

References

Almanasreh, E., Moles, R., & Chen, T. F. (2019). Evaluation of methods used for estimating content validity. *Research in Social and Administrative Pharmacy*, *15*(2), 214–221. https://doi.org/10.1016/j.sapharm.2018.03.066

American Educational Research Association (AERA), American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. American Educational Research Association.

Bao, Y., Gao, M., Luo, D., & Zhou, X. (2021). Effects of children's outdoor physical activity in the urban neighborhood activity space environment. *Frontiers in Public Health*, *9*, 631492. https://doi.org/10.3389/fpubh.2021.631492

Bao, Y., Gao, M., Luo, D., & Zhou, X. (2022). The influence of outdoor play spaces in urban parks on children's social anxiety. *Frontiers in Public Health*, *10*, 1046399. https://doi.org/10.3389/fpubh.2022.1046399

Brussoni, M., Gibbons, R., Gray, C., Ishikawa, T., Sandseter, E. B. H., Bienenstock, A., Chabot, G., Fuselli, P., Herrington, S., Janssen, I., Pickett, W., Power, M., Stanger, N., Sampson, M., & Tremblay, M. S. (2015). What is the relationship between risky outdoor play and health in children? A systematic review. *International Journal of Environmental Research and Public Health*, *12*(6), 6423–6454. https://doi.org/10.3390/ijerph120606423

Brussoni, M., Ishikawa, T., Brunelle, S., & Herrington, S. (2017). Landscapes for play: Effects of an intervention to promote nature-based risky play in early childhood centres. *Journal of Environmental Psychology*, *54*, 139–150. https://doi.org/10.1016/j.jenvp.2017.11.001

Burke, J. (2012). "Some kids climb up; Some kids climb down": Culturally constructed play-worlds of children with impairments. *Disability & Society*, *27*(7), 965–981.

Burke, J. (2013). Just for the fun of it: Making playgrounds accessible to all children. *World Leisure Journal*, *55*(1), 83–95. https://doi.org/10.1080/04419057.2012.759144

Caro, H., Altenburg, T., Dedding, C., & Chinapaw, M. (2016). Dutch primary schoolchildren's perspectives of activity-friendly school playgrounds: A participatory study. *International Journal of Environmental Research and Public Health*, *13*(6), 526. https://doi.org/10.3390/ijerph13060526

Casey, T., & Harbottle, H. (2018). *Free to Play: A guide to creating accessible and inclusive public play spaces*. Inspiring Scotland, Play Scotland, & Nancy Ovens Trust. https://www.inspiringscotland.org.uk/wp-content/uploads/2018/05/Free-to-Play-Guide-to-Accessible-and-Inclusive-Play-Spaces-Casey-Harbottle-2018

Cetken-Aktas, S., & Sevimli-Celik, S. (2023). Play preferences of preschoolers according to the design of outdoor play areas. *Early Childhood Education Journal, 51*, 955–970. https://doi.org/10.1007/s10643-022-01358-7

Children's Play Policy Forum & UK Play Safety Forum. (2022). *Position statement: Including disabled children in play provision*. https://playsafetyforum.files.wordpress.com/2022/06/including-disabled-children-in-play-provision-2022.pdf

Dallimore, D. (2023). *What children say about play in Wales: 2022*. Play Wales. https://play.wales/news_category/what-children-say-about-play-in-wales-2022/

Diamond, I. R., Grant, R. C., Feldman, B. M., Pencharz, P. B., Ling, S. C., Moore, A. M., & Wales, P. W. (2014). Defining consensus: A systematic review recommends methodologic criteria for reporting of Delphi studies. *Journal of Clinical Epidemiology*, *67*(4), 401–409. https://doi.org/10.1016/j.jclinepi.2013.12.002

FitzGibbon, L., & Dodd, H. (2023). *The state of play in Scotland*. Play Scotland. https://www.playscotland.org/resources/print/State-of-Play-in-Scotland-2023.pdf?plsctml_id=24133

Frost, J. L., Wortham, S., & Reifel, S. (2001). *Play and development*. Prentice-Hall, Inc.

Gibson, J. J. (1979). *The ecological approach to visual perception*. Lawrence Erlbaum Associates, Inc.

Gill, T. (2014). The benefits of children's engagement with nature: A systematic literature review. *Children, Youth and Environments*, *24*(2), 10. https://doi.org/10.7721/chilyoutenvi.24.2.0010

Gustat, J., Anderson, C. E., & Slater, S. J. (2020). Development and testing of a brief play space audit tool. *Journal of Physical Activity and Health*, *17*(1), 13–20. https://doi.org/10.1123/jpah.2018-0686

Heft, H. (1988). Affordances of children's environments: A functional approach to environmental description. *Children's Environments Quarterly*, *5*(3), 29–37. https://doi.org/10.4324/9781315542553-12

Helleman, G., Nio, I., & De Vries, S. I. (2023). Playing outdoors: What do children do, where and with whom? *Journal of Childhood, Education & Society*, *4*(3), 322–337. https://doi.org/10.37291/2717638X.202343285

Horton, J., & Kraftl, P. (2018). Three playgrounds: Researching the multiple geographies of children's outdoor play. *Environment and Planning A: Economy and Space*, *50*(1), 214–235. https://doi.org/10.1177/0308518X17735324

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

IBM Corp. (2021). *IBM SPSS Statistics for Windows* (Version 28.0) [Computer software]. IBM Corp.

INSPIRE Consultancy Ltd. & Play England. (2009). *Playable Space Quality Assessment Tool*. Play England and NCB.

Iwarsson, S., & Ståhl, A. (2003). Accessibility, usability and universal design—Positioning and definition of concepts describing person-environment relationships. *Disability and Rehabilitation*, *25*(2), 57–66. https://doi.org/10.1080/dre.25.2.57.66

Jansson, M. (2008). Children's perspectives on public playgrounds in two Swedish communities. *Children, Youth and Environments*, *18*(2), 88–109. https://doi.org/10.7721/chilyoutenvi.18.2.0088

Jansson, M. (2010). Attractive playgrounds: Some factors affecting user interest and visiting patterns. *Landscape Research*, *35*(1), 63–81. https://doi.org/10.1080/01426390903414950

Jansson, M., Sundevall, E., & Wales, M. (2016). The role of green spaces and their management in a child-friendly urban village. *Urban Forestry & Urban Greening*, *18*, 228–236. https://doi.org/10.1016/j.ufug.2016.06.014

Jenkins, G., Yuen, H., Rose, E., Maher, A., Gregory, K., & Cotton, M. (2015). Disparities in quality of park play spaces between two cities with diverse income and race/ethnicity composition: A pilot study. *International Journal of Environmental Research and Public Health*, *12*(7), 8009–8022. https://doi.org/10.3390/ijerph120708009

Karaba Bäckström, M., Lundgreen, E., & Slaug, B. (2024). Mitigating the effects of climate change in children's outdoor play environments. *Scandinavian Journal of Occupational Therapy*, *31*(1), 1–13. https://doi.org/10.1080/11038128.2023.2275697

Kaştaş-Uzun, İ., & Dikmen-Güleryüz, O. (2024). Comprehensive evaluation approach in the assessment of play value of playgrounds: Case of Balçova, İzmir. *Journal of Urban Design, 29*(1), 98–121. https://doi.org/10.1080/13574809.2023.2194617

Keeney, S., McKenna, H., & Hasson, F. (2011). *The Delphi Technique in nursing and health research*. John Wiley & Sons, Incorporated.

Kyttä, M. (2002). Affordances of children's environments in the context of cities, small towns, suburbs and rural villages in Finland and Belarus. *Journal of Environmental Psychology*, *22*(1–2), 109–123. https://doi.org/10.1006/jevp.2001.0249

Lynch, H., Moore, A., Edwards, C., & Horgan, L. (2018). *Community parks and playgrounds: Intergenerational participation through universal design. Final report for the Centre for Excellence in Universal Design at the National Disability Authority*. National Disability Authority. http://rgdoi.net/10.13140/RG.2.2.22422.60486

Lynch, H., Moore, A., Edwards, C., & Horgan, L. (2020). Advancing play participation for all: The challenge of addressing play diversity and inclusion in community parks and playgrounds. *British Journal of Occupational Therapy*, *83*(2), 107–117. https://doi.org/10.1177/0308022619881936

Martin, M., Jelić, A., & Doktor Olsen Tvedebrink, T. (2023). Children's opportunities for play in the built environment: A scoping review. *Children's Geographies*, *21*(6), 1154–1170. https://doi.org/10.1080/14733285.2023.2214505

Moloney, C., de Bhailís, C., Kennan, D., Kealy, C., Quinlivan, S., Flynn, E., & Phiri, J. (2021). *Mind the gap: Barriers to the realisation of the rights of children*

with disabilities in Ireland. Ombudsman for Children's Office and Centre for Disability Law and Policy at National University College Galway.

Moore, A., Boyle, B., & Lynch, H. (2023). Designing for inclusion in public playgrounds: A scoping review of definitions, and utilization of universal design. *Disability and Rehabilitation: Assistive Technology*, *21*(3), 422–441. https://doi.org/10.1080/17483107.2021.2022788

Moore, A., & Lynch, H. (2015). Accessibility and usability of playground environments for children under 12: A scoping review. *Scandinavian Journal of Occupational Therapy*, *22*(5), 331–344. https://doi.org/10.3109/11038128.2015.1049549

Moore, A., Lynch, H., & Boyle, B. (2022). A national study of playground professionals universal design implementation practices. *Landscape Research*, *47*(5), 611–627. https://doi.org/10.1080/01426397.2022.2058478

Morgenthaler, T. (2025). *Evaluating children's outdoor play: Developing the playground play value and usability audit tool* [PhD thesis, University College Cork, Ireland & Queen Margret University Edinburgh, Scotland]. https://hdl.handle.net/10468/17504

Morgenthaler, T., Lynch, H., Loebach, J., Pentland, D., & Schulze, C. (2024). Using the theory of affordance to understand environment–play transactions: Environmental taxonomy of outdoor play space features—A scoping review. *American Journal of Occupational Therapy*, *78*(4), 7804185120. https://doi.org/10.5014/ajot.2024.050606

Morgenthaler, T., Schulze, C., Pentland, D., & Lynch, H. (2023). Environmental qualities that enhance outdoor play in community playgrounds from the perspective of children with and without disabilities: A scoping review. *International Journal of Environmental Research and Public Health*, *20*(3), 1763. https://doi.org/10.3390/ijerph20031763

Nasa, P., Jain, R., & Juneja, D. (2021). Delphi methodology in healthcare research: How to decide its appropriateness. *World Journal of Methodology*, *11*(4), 116–129. https://doi.org/10.5662/wjm.v11.i4.116

Nicholson, J., Kurnik, J., Jevgjovikj, M., & Ufoegbune, V. (2015). Deconstructing adults' and children's discourse on children's play: Listening to children's voices to destabilise deficit narratives. *Early Child Development and Care*, *185*(10), 1569–1586. https://doi.org/10.1080/03004430.2015.1011149

Olgan, R., & Kahriman-Öztürk, D. (2011). An investigation in the playgrounds of public and private preschools in Ankara. *Education and Science*, *36*(161), 85–97.

Ontario Parks Association. (2001). *Playability tool kit: Building accessible playspaces*. Ontario Parks Association.

Parker, R., & Al-Maiyah, S. (2022). Developing an integrated approach to the evaluation of outdoor play settings: Rethinking the position of play value. *Children's Geographies*, *20*(1), 1–23. https://doi.org/10.1080/14733285.2021.1912294

Perry, M. A., Devan, H., Fitzgerald, H., Han, K., Liu, L.-T., & Rouse, J. (2018). Accessibility and usability of parks and playgrounds. *Disability and Health Journal*, *11*(2), 221–229. https://doi.org/10.1016/j.dhjo.2017.08.011

Playright. (2016). *Inclusive play space guide*. https://playright.org.hk/wp-content/uploads/2018/12/Playright-Inclusive-Play-Space-Guide.pdf

Prellwitz, M., & Skär, L. (2007). Usability of playgrounds for children with different abilities. *Occupational Therapy International*, *14*(3), 144–155. https://doi.org/10.1002/oti.230

Randrup, T. B., Svännel, J., Sunding, A., Jansson, M., & Sang, Å. O. (2021). Urban open space management in the Nordic countries. Identification of current challenges based on managers' perceptions. *Cities*, *115*, 103225. https://doi.org/10.1016/j.cities.2021.103225

Refshauge, A. D., Stigsdotter, U. K., & Cosco, N. G. (2012). Adults' motivation for bringing their children to park playgrounds. *Urban Forestry and Urban Greening*, *11*(4), 396–405. https://doi.org/10.1016/j.ufug.2012.06.002

Refshauge, A. D., Stigsdotter, U. K., Lamm, B., & Thorleifsdottir, K. (2015). Evidence-based playground design: Lessons learned from theory to practice. *Landscape Research*, *40*(2), 226–246. https://doi.org/10.1080/01426397.2013.824073

Ripat, J., & Becker, P. (2012). Playground usability: What do playground users say? *Occupational Therapy International*, *19*(3), 144–153. https://doi.org/10.1002/oti.1331

Schneider, J., & Jansson, M. (2023). *Lekplatsers kvalitet och kvantitet över tid—Ett projekt inom fortlöpande miljöanalys*. Institutionen för landskapsarkitektur, planering och förvaltning, Sveriges lantbruksuniversitet; Lekplatsers kvalitet och kvantitet över tid - Ett projekt inom fortlöpande miljöanalys [Quality of playgrounds and quantity over time - A project with continuous environmental analysis]. https://doi.org/10.54612/a.7n85nd798h

Schulze, C., Page, J., Kottorp, A., & Lilja, M. (2013). Adapting functional assessments for use in a new context: A balancing act. *Scandinavian Journal of Occupational Therapy*, *20*(5), 336–342. https://doi.org/10.3109/11038128.2013.802010

Sireci, S. (2016). On the validity of useless tests. *Assessment in Education: Principles, Policy & Practice*, *23*(2), 226–235. https://doi.org/10.1080/0969594X.2015.1072084

Sireci, S., & Benítez, I. (2023). Evidence for test validation: A guide for practitioners. *Psicothema*, *35.3*, 217–226. https://doi.org/10.7334/psicothema2022.477

Sterman, J. J., Naughton, G. A., Bundy, A. C., Froude, E., & Villeneuve, M. A. (2019). Planning for outdoor play: Government and family decision-making. *Scandinavian Journal of Occupational Therapy*, *26*(7), 484–495. https://doi.org/10.1080/11038128.2018.1447010

Taylor, P., Godfrey, A., Back, P., Bennett, L., Sinclair, P., & Kapasi, H. (2008). Testing the feasibility of performance indicators for play facilities in England. *Managing Leisure, 13*(3–4), 207–226. https://doi.org/10.1080/13606710802200894

Taylor, L. G., Primucci, M., Vanderloo, L. M., Arbour-Nicitopoulos, K. P., Leo, J., Gilliland, J., & Tucker, P. (2023). A scoping review of tools to evaluate existing playgrounds for inclusivity of children with disabilities. *Frontiers in Rehabilitation Sciences*, *4*, 1102490. https://doi.org/10.3389/fresc.2023.1102490

United Nations Committee on the Rights of the Child. (1989). *Convention on the Rights of the Child*. https://www.unicef.org.au/united-nations-convention-on-the-rights-of-the-child

van Heel, B. F., van den Born, R. J. G., & Aarts, M. N. C. (2023). Everyday childhood nature experiences in an era of urbanisation: An analysis of Dutch children's drawings of their favourite place to play outdoors. *Children's Geographies*, *21*(3), 378–393. https://doi.org/10.1080/14733285.2022.2071600

Van Melik, R., & Althuizen, N. (2022). Inclusive play policies: Disabled children and their access to Dutch playgrounds. *Tijdschrift Voor Economische En Sociale Geografie*, *113*(2), 117–130. https://doi.org/10.1111/tesg.12457

von der Gracht, H. A. (2012). Consensus measurement in Delphi studies. *Technological Forecasting and Social Change*, *79*(8), 1525–1536. https://doi.org/10.1016/j.techfore.2012.04.013

Weber, E., Anneken, V., Stephany, T., Thönnes, L., & Burger, C. (2023). *Inklusion auf Spielplätzen in Deutschland [Inclusion on playgrounds in Germany]*. Aktion Mensch e.V and Forschungsinstitut für Inklusion durch Bewegung und Sport GmbH.

Wenger, I., Lynch, H., Prellwitz, M., & Schulze, C. (2023). Children's experiences of playground characteristics that contribute to play value and inclusion: Insights from a meta-ethnography. *Journal of Occupational Science*, *31*(3), 1–28. https://doi.org/10.1080/14427591.2023.2248135

Wenger, I., Prellwitz, M., Lundström, U., Lynch, H., & Schulze, C. (2023). Designing inclusive playgrounds in Switzerland: Why is it so complex? *Children's Geographies*, *21*, 487–501. https://doi.org/10.1080/14733285.2022.2077093

Woolley, H., & Lowe, A. (2013). Exploring the relationship between design approach and play value of outdoor play spaces. *Landscape Research*, *38*(1), 53–74. https://doi.org/10.1080/01426397.2011.640432

Yantzi, N. M., Young, N. L., & Mckeever, P. (2010). The suitability of school playgrounds for physically disabled children. *Children's Geographies*, *8*(1), 65–78. https://doi.org/10.1080/14733281003650984

Zallio, M., & Clarkson, P. J. (2021). On inclusion, diversity, equity, and accessibility in civil engineering and architectural design: A review of assessment tools. *Proceedings of the Design Society*, *1*, 2297–2306. https://doi.org/10.1017/pds.2021.491

Appendix A.

Numerical analysis of content changes from PVUA Version 1-3

	v.1.0	**v.2.0**	**v.3.0**
Changes in content areas header and description			
Number of content areas total	26	30	28
Number of new content areas		4	n/a
Number name adjusted content areas		13	10
Number of adjusted descriptions of content areas		All content areas	11
Number of deleted content areas		n/a	2
Changes on item level			
Number of items total	211	221	203
Number of items deleted (redundant)	n/a	Minus 22	Minus 26
Number of items new (added)	n/a	Plus 44	Plus 10
Number of items merged with other items	n/a	Minus 12	Minus 2
Number of items rephrased to clarify the meaning	n/a	40	36
Number of items rephrased with minor changes (small changes keep the meaning of an item)	n/a	All items	40
Number of shortened items (keep the meaning of an item)	n/a	n/a	6
Number of added more details to item (keep the meaning of an item)	n/a	n/a	11
Instruction of PVUA	n/a	All instructions	n/a
Scoring text		All scoring texts	n/a
TOTAL adjustments:		396	158