



Screening for Developmental Coordination Disorder Before Diagnostic Age: Ongoing Psychometric Assessment of the Little Developmental Coordination Disorder Questionnaire (LDCDQ)

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Developmental Coordination Disorder in Early Childhood

- ~6% prevalence (APA, 2022; Blank et al., 2019)
- **Multi-dimensional** disability with significant long-term functional and social-emotional impacts (Tal-Saban & Kirby, 2018; Zwicker et al., 2018)
- Not typically diagnosed before age 5 (Blank et al., 2019) **BUT**
- Consider Dx Criterion C: *Onset of symptoms is in the early developmental period*
- Motor development of young children has consequential impacts from the earliest of ages (Figueroa & An, 2017)

The Little Developmental Coordination Disorder Questionnaire (Little DCDQ)

- According to Cheraghi et al. (2022), ages 3–4:
 - critical window
 - "golden age" of motor development
 - fundamental motor skills are established
 - (Cheraghi et al., 2022)
- Early identification of children with markers of DCD may facilitate timely developmental support
- Little DCDQ originally developed in the Hebrew language, for motor coordination screening of children between the ages of 3 and 5

Original LDCDQ Publication
(Rihtman, Wilson & Parush, 2011)



Updated Little DCDQ Publication
(Rihtman & Tal-Saban, 2026)



Why This Research?

- **Instrument validation processes can not be assumed to cease**
- **The original Little DCDQ was found to differentiate between children with and without functional motor coordination difficulties, however, the psychometric properties were initially examined over 10 years**
- **Study aimed to:**
 - **Assess the psychometric properties of the original Hebrew LDCDQ with an expanded sample**
 - **Investigate criterion validity**
 - **Investigate sensitivity, specificity and proposed cutoff scores**

Methods: Participants

n=399 children; 36-59 months ($M_{age} = 48.48 \pm 6.73$)

TYPICALLY DEVELOPING GROUP

n=269

($M_{age} = 47.65 \pm 6.78$)

REFERRED GROUP

n=130

($M_{age} = 50.09 \pm 6.35$)

	TD	REFERRED
Parental fluency in Hebrew	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Child's age	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Referred for/receiving motor or language development treatment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suspected/diagnosed cognitive deficit, autism spectrum disorder, neuromotor disorder or sensory loss	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Methods: Instruments

- Demographic questionnaire
- **Little Developmental Coordination Disorder Questionnaire (LDCD) (Rihtman, Wilson & Parush, 2011)**
- **The Movement Assessment Battery for Children, Second Edition (MABC2) (Henderson, Sugden & Barnett, 2007)**

Methods: Procedure

Ethical approval

Typically developing children:

Convenience/snowballing sampling (social media and online parent fora)

Referred children:

Purposive sampling (supported by nation-wide child development centre occupational therapists)

Informed consent:

Option to participate with/out MABC2

LDCDQ and demographic questionnaire:

Completed by all parents

Movement Assessment Battery for Children (MABC2) - n=77 children

TD: n=24 - trained research assistant

Referred: n=53 - part of Child Development Centre assessment

Results: No Between-Group Age Differences

Three-year olds

TD (n=128) / referred (n=41) 3-year-old

$t[167]=-1.01$; $p=0.15$

Four-year olds

TD (n=141) / referred (n=89)

$t[228]=-1.14$; $p=0.13$

Results: Internal Consistency

	TD (n=269)	Referred n=130)	Total (n=399)
CDM	0.778*	0.862	0.882
FM	0.700	0.822	0.830
GC	0.690**	0.734†	0.827
Total	0.846	0.882	0.922

*0.797 if item 5 (moves from place to place) were removed

**0.696 if item 13 (playground equipment) were removed

†0.744 if item 15 (sits upright) were removed

Results: Construct Validity

	3.0-3.11 M(SD)		t	Cohen's d	4.0-4.11 M(SD)		t	Cohen's d	Total M(SD)		t	Cohen's d
	Referred n=41	Control n=128			Referred n=89	Control n=141			Referred n=130	Control n=269		
CDM	15.46 (4.66)	22.01 (2.83)			17.61 (5.05)	22.50 (2.73)			16.93 (5.01)	22.27 (2.79)		
FM	20.07 (3.67)	23.70 (1.95)			20.24 (4.06)	23.92 (1.86)			20.18 (3.92)	23.81 (1.90)		
GC	17.32 (4.03)	23.34 (2.26)			18.47 (3.91)	23.13 (2.20)			18.11 (3.97)	23.23 (2.23)		
Total	52.85 (9.58)	69.05 (5.69)	t(49.33)=10.26 p<0.001	2.37	56.31 (10.80)	69.56 (5.65)	t(118.74)=10.68 p<0.001	1.65	55.22 (10.52)	69.32 (5.66)	t(166.05)=14.30 p<0.001	1.86

Multivariate Analyses of Variance (CDM, FM, GC)

Full Sample

Wilk's L=0.56 F[3,395]=103.05, p<0.001, h2=0.44)

Scheffe post-hoc: for all scores

TD>referred, with large effect sizes

CDM: F[1,397]=186.25, p<0.001, h2=0.32

FM: (F[1,397]=154.94, p<0.001, h2=0.28

GC: (F[1,397]=271.93, p<0.001, h2=0.41

3 Year Olds

Wilk's L=0.48, F[3,165]=59.48, p<0.001, h2=0.52

Scheffe post-hoc: for all scores

TD>referred, with large effect sizes

CDM: F[1,167]=117.57, p<0.001, h2=0.41

FM: F[1,167]=66.45, p<0.001, h2=0.28

GC: F[1,167]=144.92, p<0.001, h2=0.46

4 Year Olds

Wilk's L=0.59, F[3,226]=50.69, p<0.001, h2=0.40

Scheffe post-hoc: for all scores

TD>referred, with large effect sizes

CDM: F[1,228]=90.73, p<0.001, h2=0.28

FM: F[1,228]=87.57, p<0.001, h2=0.28

GC: F[1,228]=133.72, p<0.001, h2=0.37

Results: Criterion Validity

Concurrent Validity

	MABC2 Manual Dexterity Percentile	MABC2 Aiming & Catching Percentile	MABC2 Balance Percentile
LDCDQ CDM	$r=0.36$ $p<0.001^*$	$r=0.43$ $p<0.001^*$	$r=0.53$ $p<0.001^*$
LDCDQ FM	$r=0.36$ $p<0.001^*$	$r=-0.13$ $p=0.91$	$r=0.48$ $p<0.01^*$
LDCDQ GC	$r=0.39$ $p<0.001^*$	$r=0.35$ $p<0.01^*$	$r=0.48$ $p<0.001^*$

Results: Criterion Validity

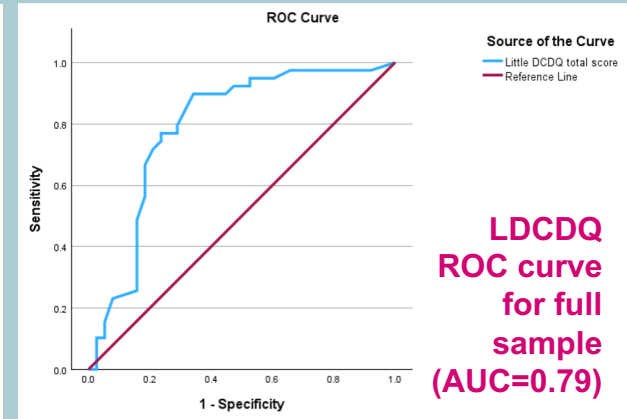
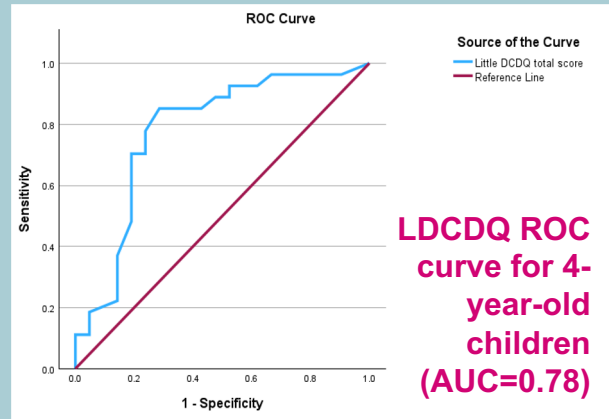
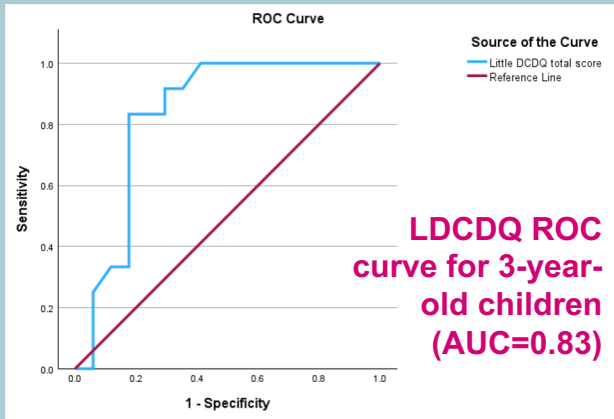
Predictive Validity: Binary logistic regression

- Gender and LDCDQ total score significant predictors ($p < 0.001$) of group placement (OR 0.82, 95% CI 0.79-0.85); model goodness of fit: $p < 0.001$
- Males 4 times more likely to be in the referred group than females (OR 0.25, 95% CI 0.13-0.48); for every Little DCDQ point decrease, odds of being in the referred group increases by 22%

Subscores as predictors of group placement:

- All subscores significantly predicted group placement:
 - CDM: OR 0.87, 95% CI 0.79-0.96, $p < 0.01$
Odds of being in the referred group 15% per point decrease
 - FM: OR 0.86, 95% CI 0.76-0.98, $p = 0.01$
Odds of being in the referred group 16% per point decrease
 - GC: OR 0.73, 95% CI 0.64-0.84, $p < 0.001$
Odds of being in the referred group 37% per point decrease

Results: Sensitivity, Specificity & Cut-Off Scores



Age	Cut off score	AUC	Sensitivity	Specificity
3 year olds	≤71	0.83 (95% CI [0.68-0.99])	100%	65%
4 year olds	≤70	0.78 (95% CI [0.64-0.92])	96%	67%
Total	≤70	0.79 (95% CI [0.68-0.90])	97%	69%

Implications & Conclusions

- **Identification of motor-based activity limitations in early childhood facilitates effective follow-up and inclusion in developmental screening programs, ultimately impacting family well-being and children's participation (González López et al., 2022)**
- **Obtaining a formal diagnosis of DCD has been shown to improve access to therapy and support (Klein et al., 2024)**
- **The total LDCDQ score, and all subscores, significantly predict group placement**
- **Recommended cut-off scores have been suggested, such that the usability of the instrument in early childhood settings is notably enhanced**
- **Utility of Little DCDQ as a screening tool: identification of preschool children with functionally-impactful motor coordination difficulties, supporting its usability to facilitate the provision of timely developmental support**

www.littledcdq.com

The Little Developmental Coordination Disorder questionnaire (LDCDQ) is a parent/carer screening questionnaire designed to identify preschool children with functional motor difficulties suggestive of risk of a later diagnosis of DCD. The LDCDQ has been widely translated and culturally adapted by an international consortium of DCD researchers.

The Little Developmental Coordination Disorder Questionnaire website has been developed to:

- *consolidate a growing body of knowledge about motor coordination difficulties in children younger than 5
- *share free access to all approved versions of the LDCDQ

The website provides information about:

- *early childhood motor development
- *supporting children who show signs of early motor coordination difficulties
- *cross-cultural research into processes of adapting the LDCDQ

The website can also be used to:

- *complete culturally appropriate, approved version of the LDCDQ for individual children, and gain their scores
- *learn more about participating in ongoing research using the LDCDQ

By supporting parents, carers, educators and healthcare professionals to better understand patterns of early childhood motor development, and equip them with means to identify young children at risk, it is hoped that younger children who may ultimately be given a diagnosis of DCD can be offered more timely support

LDCDQ International Collaboration

lia - English (LDCDQ-AUS)

m - Flemish (LDCDQ-BE)

- Portuguese (LDCDQ-BR)

a - French (LDCDQ-FCa)

a - **English** (LDCDQ-Ca)

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te website)

d - Finnish (LDCDQ-FI)

- French (LDCDQ-FE)

ny - German (LDCDQ-GE)
elopment)

🌐 **Greece** - Greek (LDCDQ-GR)

🌐 **Israel** - Hebrew (LDCDQ)

🌐 **Italy** - Italian (LDCDQ-IT)

🌐 **Japan** - Japanese (LDCDQ-J)

🌐 **Mainland China** - Chinese
(LDCDQ-CH)

🌐 **Netherlands** - Dutch
(LDCDQ-NL)

🌐 **Slovenia** - Slovene
(LDCDQ-SL)

🌐 **South Africa** - Afrikaans
(LDCDQ-AFR)

🌐 **South Africa** - English
(LDCDQ-SA)

🌐 **South Africa** - Tswana
(LDCDQ-TSW)

🌐 **Switzerland** - French
(LDCDQ-FE)

🌐 **Taiwan** - Mandarin
(LDCDQ-TW)

🌐 **Turkiyeh** - Turkish

🌐 **United Kingdom** -
(LDCDQ-UK)

🌐 **United States** - English
(LDCDQ-US)

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