Early Play and Associated Developmental Skills in Toddlers With and Without Down Syndrome

Project CAPE-abilities
Communication And Play Early abilities in Down Syndrome

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BACKGROUND

- **Why Play?**

- Children with **Down syndrome (DS)** generally progress through the same **sequence of play development** as typically developing (TD) children, but on a delayed timetable.
- A key gap is understanding whether toddlers with DS show **similar play profiles** to younger children without DS who are at broadly comparable **developmental levels**.
- Examining concurrent links between **play** and **cognitive, language**, and **motor skills** may help identify clinically relevant supports for promoting play in toddlers with DS.

OBJECTIVES

1. **Compare early play profiles in toddlers with DS and a younger non-DS developmental comparison group (CG).**
2. **Examine whether cognitive, language, and motor skills are associated with more advanced observed play in toddlers with DS.**

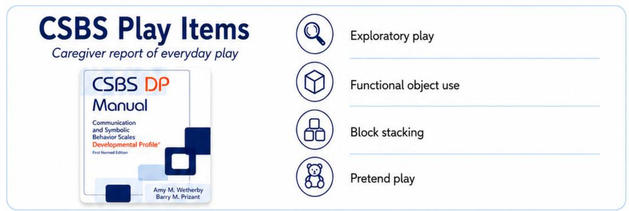
PARTICIPANTS

- Toddlers with DS from CAPE Wave 1 were compared with a younger non-DS comparison group from ISP2.
- The comparison group (CG) provided a developmental reference point, with overlapping developmental age-equivalent scores across domains.

Characteristic	DS	CG
N	181	263
Female, n (%)	94 (52.8%)	102 (39.2%)
Chronological age, months	20.29 (1.57) 17.38–24.74	13.23 (0.90) 11.80–16.47
Developmental AE scores, months		
Cognitive	11.62 (2.64)	13.99 (2.35)
Receptive language	9.81 (3.35)	11.42 (3.25)
Expressive language	11.12 (3.23)	13.48 (2.48)
Fine motor	11.52 (3.19)	14.84 (2.25)
Gross motor	10.30 (2.36)	13.67 (2.42)

MEASURES

- **Play behavior** was measured using **ADOS-2 C codes** from direct observation and **CSBS play items** from caregiver report.
- **Developmental skills** were indexed using **Bayley-4** in the DS group and **Mullen** in the comparison group.



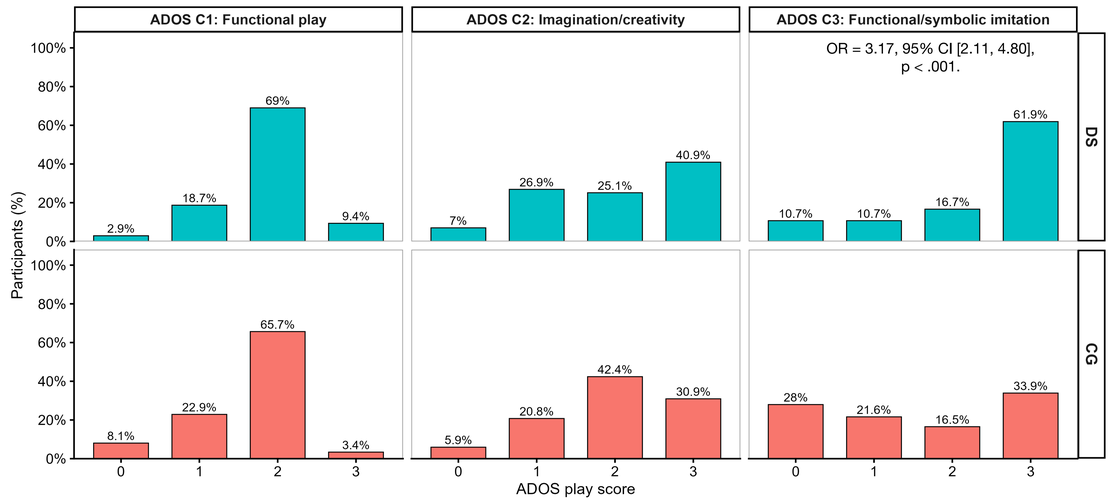
ANALYSES

- DS–CG differences in ADOS and CSBS play score distributions were explored using chi-square/Fisher's exact tests with FDR correction.
- For DS-only models, ADOS scores were dichotomized as more advanced play, codes 0/1, versus less advanced play, codes 2/3.
- Age-adjusted logistic models examined whether cognitive, language, and motor AE scores predicted more advanced ADOS play.

RESULTS

1. Toddlers with DS showed more difficulty with functional/symbolic imitation

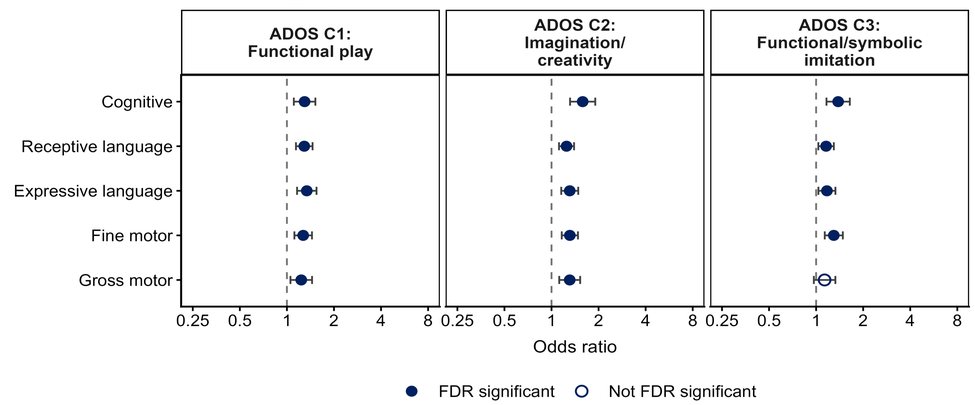
ADOS play score distributions by group; 0 = more developed skills, 3 = not yet observed in context



- ADOS score distributions differed across C1–C3, but the **clearest difference was for C3 functional/symbolic imitation**. Toddlers with DS were more likely than CG to receive the least advanced C3 score, 61.9% vs. 33.9%, $\chi^2(3) = 37.77$, $p < .001$, $q < .001$.
- In contrast to observed ADOS play scores, **caregiver-reported CSBS play items did not significantly differentiate DS and CG** after FDR correction, all $q \geq .146$.

2. Higher developmental skills predicted more advanced play in DS

Age-adjusted ORs for ADOS codes 0/1 vs. 2/3; OR > 1 = more advanced play



- In DS-only age-adjusted models, **higher developmental AE scores** were associated **with greater odds of more advanced ADOS play across 14 of 15 models**. **Cognitive skills** showed the **strongest association with imagination/creativity**, while gross motor was not significantly associated with functional/symbolic imitation.

CONCLUSIONS

- Comparing toddlers with DS to a younger developmental comparison group helps clarify which early play patterns are broadly developmentally expected and which may represent **specific intervention targets for DS**.
- **Functional/symbolic imitation** may be an important intervention target for toddlers with DS, particularly imitation of modeled object-use and pretend-play actions.
- In DS, more advanced play was linked with **cognitive, language, and motor skills**, suggesting that play interventions may be most effective when they integrate developmental supports within natural play routines.