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A dissociation between face perception and face memory in adults, but not children, with developmental prosopagnosia

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DEVELOPMENTAL PROSOPAGNOSIA (DP) is defined

by severe face recognition difficulties resulting from the failure to develop the necessary visual mechanisms for processing faces. Theories of face processing predict that impaired face recognition can result from deficits of face perception, face memory, or both.

Are face perception and face memory dissociable in developmental prosopagnosia?

PARTICIPANTS

Children:

- N=8, 5-12-years-old (M=8.5years, SD=2.6) recruited through faceblind.org.
- Parents provided anecdotal reports of face recognition difficulties in daily life.
- Normal or corrected-to-normal vision, normal or above average IQ, no autism spectrum disorders.

Participant info		Memory		Perception	
ID (Age/Sex)	IQ (WASI-II)	Cambridge Bicycle Memory Test	Cambridge Face Memory Test- Kids	Old/New Faces	Dartmouth Face Perception Test
CM (5F)	V: 138 P:120	77.1% 69.1	37.5%* 39.0	50.0% 72.3	35.0%* 72.7
CM (6F)	V: 122 P:112	50.0% 115.6	43.8% 18.5	46.7% 72.3	40.0%* 72.7
OP (6M)	V: N/A P: N/A	N/A	37.5% 59.0	63.3% 72.3	42.5%* 72.7
AO (8M)	V: 132 P: 122	79.2% 82.1	37.5%* 39.0	56.7%* 77.8	40.0%* 72.7
DD (10M)	V: 113 P: 105	68.1% 84.4	56.9%* 72.0	73.3%* 86.3	65.0%* 77.5
NL (10M)	V: 120 P: 117	84.7% 88.0	34.7%* 82.7	33.3%* 87.7	30.0%* 89.0
SWJ (11M)	V: 154 P: 126	59.7%* 89.0	71.6 112.7	60.0%* 87.0	35.0%* 88.1
MF (12F)	V: 91 P: 86	72.2% 84.7	51.4%* 79.4	56.7%* 90.0	47.5%* 89.9

* >2SD below control means all children compared to at least 12 age-matched controls, except CM, CM, and OP: who were compared to 7-year-olds. Control means (SD) noted beside each DP score. Chance level performance for CBMT-K, DFMT-K, DFPT: 33%; Old/New: 50%.

Adults:

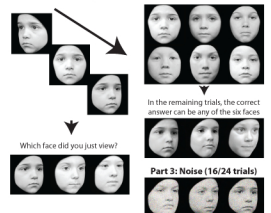
- N=16, 20-46-years-old (M=31.5, SD=7.4) recruited through faceblind.org.
- Provided anecdotal reports of face recognition difficulties in daily life.
- All had normal or corrected-to-normal vision, normal or above average IQ, no autism spectrum disorders.

CHILD ASSESSMENTS

Cambridge Face Memory Test - Kids

Children <10 years memorized 4 targets, children 10 years+ memorized 6 targets

Part 1: Introduction (12/18 trials) Memorize (3 seconds per face)
Part 2: Any target (20/30 trials) Memorize (20 seconds)



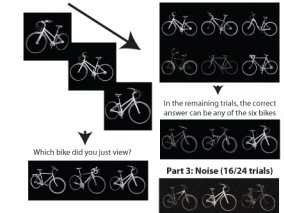
Old/New Face Memory Test



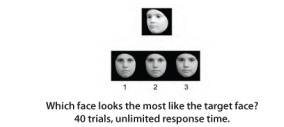
Cambridge Bicycle Memory Test - Kids

Children <10 years memorized 4 targets, children 10 years+ memorized 6 targets

Part 1: Introduction (12/18 trials) Memorize (3 seconds per bike)
Part 2: Any target (20/30 trials) Memorize (20 seconds)



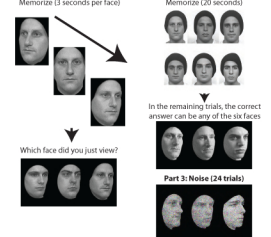
Dartmouth Face Perception Test



ADULT ASSESSMENTS

Cambridge Face Memory Test (Duchaine & Nakayama, 2006)

Part 1: Introduction (18 trials) Memorize (3 seconds per face)
Part 2: Any target (30 trials) Memorize (20 seconds)



Old/New Face Memory Test

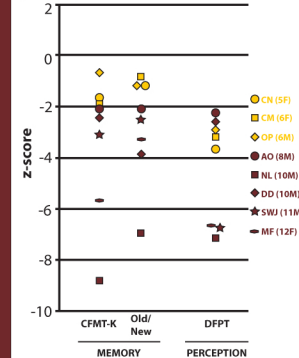


Cambridge Face Perception Test (Duchaine, Yovel, & Nakayama, 2007)

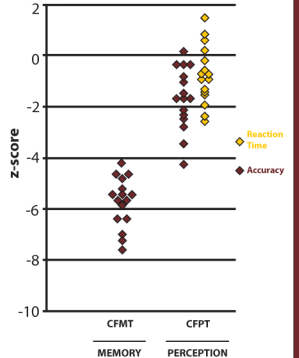


RESULTS

Children



Adults



All children have impaired face memory and face perception. Younger children were not 2SD below the mean, but accuracy was near chance (see table).

All adults have impaired face memory, but only 6 have impaired face perception. Only 2 have abnormal reaction times on the perception task.

CONCLUSIONS

- Results from adults indicate that face perception and face memory are dissociable in DP, while the results from children provide no evidence for this division.
- Our findings raise the possibility that DP is qualitatively different in childhood versus adulthood.
- Face perception may recover with age and/or face memory impairments may be difficult to detect in children who have normal face perception.

Special thanks to all the children who participated and their families, and to Lucia Garrido for providing access to data from adult DPs and controls.