

## Self-regulation: A comparative study between children with Down syndrome and typically developing children.

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## What is self-regulation?

- The effortful process by which humans control or alter their inner states or responses to a given situation (self-control)
- Requires cognitive, emotional and behavioural resources.
- Ability to set goals, to plan, make decisions, and solve problems.
- May be externally or internally imposed
  - External: waiting in a hospital emergency waiting room
  - Internal: saving for an overseas holiday.
- Delaying gratification linked to self-regulation.
  - Choosing to wait for a more desirable goal...even when more tempting, but less desirable goals, are immediately available.



## Why is Self-Regulation Important?

Ability to self-regulate at age 4<sup>1</sup> is predictive of more positive personal outcomes in adolescence<sup>2</sup> and young adulthood<sup>3</sup>.

- Interpersonal relationships
- Academic achievement\*
- Greater Self-esteem
- Greater Self-worth
- Ability to cope with stress
- More dependable and reliable
- Lower frustration levels
- Less sensitivity to rejection

<sup>1</sup>(Aydik, et al., 2000; Mischel, Ebbsen, & Zeiss, 1972; Schoda, Mischel, & Peake, 1990)  
<sup>2</sup>(Duckworth & Seligman, 2005; Wehmeyer, Kelcher, & Richards, 1996)



## Development of self-regulation

- Substantial amount of research for how typically developing children acquire self-regulation.
  - Reported personality factors, such as expectations of success, effectance motivation, & outerdirectness (Bennett-Gates & Zigler, 1999).
  - Behavioural factors such as compliance, ability to inhibit, autonomy/self-distract, use of language (Kopp, 1982; LeCuyer & Houck, 1995, 2001; Frauenglass & Diaz, 1999; Purser & Jarrold, 2005).
- Little research for how children with Down syndrome acquire self-regulation,
  - yet we know this population have difficulty with this skill (Cuskelly, Einham, & Jobling, 2001; Cuskelly, Zhang, & Hayes, 2003; Mauro & Harris, 1983).



## Aims of this study

1. Differences between groups for reported self-control, compliance, independence, and personality traits. Do any of these *subjective* variables correlate with longer waiting time and/or strategy use?
2. Differences between groups for child strategies used, particularly strategies involving language? Are any of these *behavioural* strategies linked to longer waiting time?
3. Identify any differences between subjective parental reports and observed behavioural strategy use by the child.
4. For both groups, which variables assist children to self-regulate and wait longer.



## Method

### Gift Task with parent

- Externally imposed delay task (15 minutes)
  - Brightly wrapped gift placed on table, child told gift is for them, asked not to open until experimenter returns to the room.

### Mischel Task on own

- Internally imposed delay task (up to 15 minutes)
  - Child given choice of 2 bowls – one has 2 treats, the other only 1.
  - Asked to chose a bowl (always the 2!), but then asked to wait. However, can have 1 treat if they no longer want to wait.....ring bell.



### Method

#### Participants

- **Total Sample (Gift Task)**
  - 50 Typically developing children (26 boys)
    - CA:  $M = 45.76mths$  (5.53)
  - 32 children with Down syndrome (17 boys)
    - CA:  $M = 138.81mths$  (25.59)
    - MA:  $M = 45.66mths$  (6.89)
- **Sub-Sample (Mischel Task)**
  - 43 Typically developing children (22 boys)
    - CA:  $M = 46.12mths$  (5.42)
  - 22 children with Down syndrome (9 boys)
    - CA:  $M = 147.14mths$  (20.10)
    - MA:  $M = 46.73mths$  (4.73)

### Method

#### Measures (Subjective Parental report)

- **EZ Personality Questionnaire (EZPQ)**  
(Zigler, Bennett-Gates, Hodapp, & Heinrich, 2002)
  - **2-sub-scales\***:
    - Expectancy of Success (eg. "Child expects to succeed at most things")
    - Effectance Motivation (eg. "Child is a self-starter")
    - (Outerdirectedness (could not use – low internal consistency))
- **Compliance/Independence Scale (CIS)**  
(Crombie & Gold, 1989)
  - Compliance (eg. "Does your child obey your instructions?")
  - Independence (eg. "How independent is your child?")
- **Self-control rating scale (SCRS)** (Kendall & Wilcox, 1979)
  - NB: Lower scores equal higher levels of self-control
    - Eg. "Does your child think before he/she acts?"

### Method

#### Measures (observed behaviours)

- **Parent/Child Strategies Revised (PCS-R)** (LeCuyer & Houck, 2005)
  - Coding adapted and modified to accommodate both developmental groups.
  - Child strategies (verbal and physical):
    - Non-compliance (cf. compliance)
    - Follow parent (cf. compliance/social learning)
    - Inhibition (cf. self-control)
    - Autonomy (cf. independence/EM/ES)

### Results (subjective parental measures)

(significant differences only (M(SD)))

	Down syndrome	Typically Developing	$F_{(1,78)}$ ** $p < .01$ ; *** $p < .001$
Expectancy of Success	12.47 (2.72)	14.26 (2.11)	11.12**
Effectance Motivation	21.97 (4.63)	25.86 (3.66)	18.86***
Compliance	34.91 (9.00)	41.58 (8.01)	12.28***
Independence	8.34 (2.70)	14.44 (2.48)	108.43***
Self-Control	134.94 (32.61)	106.54 (22.57)	22.64***

### Results (Observed measures)

(significant differences only (M(SD)))

	Down syndrome	Typically Developing	Statistical Result * $p < .05$ ; ** $p < .01$
Waiting time in Mischel Task (in seconds)	181.32 (347.62)	440.21 (377.59)	$F_{(1,61)} = 7.41^{**}$
Verbal Autonomy	34.69	45.86	$U = 582^*$
Verbal Inhibition	32.94	45.54	$U = 526^*$

### Results

(significant correlations with waiting time)

	Down syndrome	Typically Developing
Self-Control	-.64***	ns
Effectance Motivation	.43*	ns
Physical Inhibition	.63**	ns
Verbal Non-Compliance <sup>NB</sup>	.54**	ns
Physical Non-Compliance	ns	-.34*

### Results

(significant correlations between subjective & observed measures)

	Down syndrome	Typically developing
Effect Mot / Physical Non-Compliance	ns	.30*
Indep / Verbal Non-Compliance	ns	.32*
Self-Control / Physical Inhibition	-.40*	ns
Indep / Physical Non-Compliance <sup>NB</sup>	-.53**	ns

### Results (Median Split)

(significant differences only (M(SD)))

	Waiters (>300 secs)	Non-Waiters (<300 secs)	Statistic <small>*p&lt;.05; **p&lt;.01; ***p&lt;.001</small>
SB:IV (MAE)	48.55 (6.09)	44.03 (5.32)	$F_{(1,61)} = 19.53^{***}$
PPVT-III (MAE)	54.76 (12.84)	45.56 (15.90)	$F_{(1,61)} = 6.58^{**}$
Self-Control	103 (21.72)	129.25 (31.52)	$F_{(1,61)} = 7.69^{**}$
Physical Inhibition	37.64	26.18	$U = 315.50^*$
Verbal Inhibition	36.72	27.13	$U = 345.00^*$

- ### Summary
- Typically developing children wait longer, and use more verbal inhibitory and verbal autonomous strategies, than children with Down syndrome in a self-imposed waiting task.
    - Language (private speech) may assist in developing self-regulation (Vygotsky, 1962,1978; Luria 1974; Frauenglass & Diaz, 1999) .
  - However, child characteristics for the typically developing group, as reported by their parent, did not correlate with waiting time or strategy use.
    - Young parents still learning about their child?
    - Novelty of the situation/waiting task?

- ### Summary
- For the children with Down syndrome, longer waiting times were correlated with higher levels of reported effectance motivation and self-control, and strategies of physical inhibition and verbal non-compliance.
    - Sufficient motivational drive = better self-regulation. Scaffolds to build this.
    - Self-control and physical inhibition both correlated with each other - more experienced parents correctly identifying behavioural traits.
    - Verbal non-compliance a means for children to check with parent re rules/open box (Outerdirectedness?) . May indicate a lack of internalisation and/or encoding problems in working memory (Purser & Jarrold, 2005). Language again assisting self-regulation.

- ### Summary
- For typically developing children, as reported levels of effectance motivation and independence increased, so did physical and verbal non-compliance strategies.
    - "Psychological reactance" (Brehm & Brehm, 1981)? TD children testing their freedom/ independence.
  - Similarly, as reported levels of independence for children with Down syndrome increased, so did physical non-compliance.
    - Similar to TD - Child's way of testing independence?
    - Majority of parents reported low independence – link to parenting style/strategies? Overprotection?
    - No significant differences found between the groups for physical autonomy...both groups equally as good at this.
  - For both groups**, where higher levels of self-control were reported, and more physical and verbal inhibitory strategies were used, children were able to wait longer.

- ### Conclusions
- When children with Down syndrome:
    - have sufficient motivational drive to work through a challenging problem,
    - have developed levels of self-control and
    - inhibitory control,
    - use language to the best of their ability, and
    - are encouraged to develop independence,
 their potential for self-regulation is improved.
  - These characteristics and strategies may be useful to clinicians and educators when developing scaffolded strategies and interventions that assist parents, and other interested stakeholders, to teach children with DS self-regulation.

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