

Self-Imposed Delay of Gratification in Adolescents With Down Syndrome

Monica Cuskelly and Patricia Stubbins

Abstract

This study examined the associations between ability to delay gratification and language, temperament and generalized self-regulation in young people with Down syndrome. Using a median split, those who delayed gratification longer had better expressive language, were less impulsive on a measure of temperament and had higher reported self-regulation. The combination of these variables provided very good discrimination using logistic regression.

Delay of gratification is the ability to work towards a goal and to resist temptations that would interfere with that goal, and has been shown to be predictive of a range of desirable outcomes for children. For example, researchers found that children who waited longer in a delay of gratification task at four years of age showed more independence and competence in middle childhood (Funder, Block & Block, 1983) and adolescence (Shoda, Mischel & Peake, 1990). These investigations were conducted with children who followed a typical developmental pattern. However, no such longitudinal investigations of children with an intellectual disability have been conducted. Nevertheless, it seems reasonable to assume that the ability to delay gratification would bring developmental advantages to this group as well.

Several studies have found that individuals with Down syndrome have difficulty with delay of gratification, both when instructed to wait by an adult (Cuskelly, Zhang & Hayes, 2003; Kopp, 1990) and when setting themselves the goal to wait (Cuskelly et al., 2003; Cuskelly, Einam & Jobling, 2001). The present study is a within-group investigation of the concurrent associations between ability to delay gratification and some variables hypothesized to be important to this ability. The variables included in the study were language ability, temperament, knowledge of delay rules, and self-control.

Self-talk has an important place in theories of self-regulation (Luria, 1961; Vygotsky, 1962) as it has been supposed that individuals use self-talk to guide and manage their behaviour. Self-talk is difficult to measure as it is

usually covert, however, language ability, particularly expressive language ability, may be relevant as it reflects an individual's ability to use language effectively. Rodriguez, Mischel and Shoda (1989) found an association between receptive language and waiting time in a self-imposed delay task in children with no developmental delay and it could be expected that expressive language would have an even greater association. Indeed, Cuskelly et al. (2001) reported that adults with Down syndrome who successfully waited for their goal had better expressive language than those who did not wait.

Impulsivity has been identified as a temperamental characteristic that interferes with typically developing children's self-regulation (Silverman & Ragusa, 1990). No significant associations were found between impulsivity and waiting in adults by Cuskelly et al. (2001), however, it seems likely that as individuals age they develop increased cognitive control over their behaviour and therefore the influence of temperament will decrease. As the participants in the present study were younger than those in the Cuskelly et al. investigation, temperament was included as one of the independent variables.

Mischel and colleagues identified a number of "rules" that govern success on delay of gratification tasks. These include that fact that it is easier to delay if the desired object is not in view (Mischel & Ebbeson, 1970), an understanding that typically developing children acquire around the end of age four (Mischel & Mischel, 1983). Cuskelly et al. (2001) examined knowledge of delay rules in adults with Down syndrome with inconsistent results. In the current study, we decided to focus on only the rule described above, to assess the reliability of participants' understanding, and assess its association with delay of gratification.

The ability to delay is influenced by a range of self-regulatory capacities such as the ability to deal with frustration, to set goals, and to complete tasks (Cuskelly, Zhang & Gilmore, 1998). It is likely that it is this association with these broader self-regulatory abilities used across multiple contexts that accounts, at least in part, for the demonstrated relationships between delay of gratification and competence mentioned above.

In summary, the hypotheses that guided this study were that individuals who were better able to delay gratification would display less impulsivity, expressive language skills, stronger comprehension of delay rules and more self-regulation in other contexts than those who had difficulty delaying gratification.

Method

Participants

Fifty-eight adolescents with Down syndrome between the ages of 11 and 19 years were identified from the contact list of the Down Syndrome Research Program at The University of Queensland. Sixteen of their families could not be contacted and 12 families refused. Thirty participants took part in the study, however one participant was unable to complete any of the tasks and so was excluded. The remaining 29 participants (13 females, 16 males), ranged in age from 11 to 19 ($M = 14.75$ years; $SD = 2.39$ years). Mean mental age for the group on the Stanford Binet – Fourth edition (SB:IV; Thorndike, Hagan, & Sattler 1986) was 65.92 months ($SD = 15.97$; range 40 to 97 months). The mean age equivalent score of the Peabody Picture Vocabulary Test–Third edition (PPVT-III; Dunn & Dunn, 1997) was 77.41 months ($SD = 17.22$ months), and for the Expressive Vocabulary Test (EVT; Williams, 1997) it was 66.35 months ($SD = 18.86$ months). Valid SB:IV assessments were not able to be completed for three of the participants due to uncooperative behaviour. Inspection of their PPVT-III and EVT scores indicated that the scores of these participants were distributed across the range of scores.

Measures

Cognitive ability was assessed using the six core sub-tests of the SB:IV. Language measures included the PPVT-III to assess receptive vocabulary and the EVT to assess expressive vocabulary. Age equivalent scores were used to avoid floor effects for all three instruments. The EASI-III Temperament Survey (Buss & Plomin 1975) comprises of the: Emotionality, Activity, Sociability, and Impulsivity scales. Internal consistencies for each scale were computed for this sample and, with some item deletion, found to be acceptable: Emotionality ($r = .82$, item 11 deleted), Activity ($r = .80$), Sociability ($r = .73$, item 29 deleted), and Impulsivity ($r = .79$, item 35 deleted). High scores are indicative of easier temperament. Participants were asked: (1) if they would prefer to have the reward covered (a towel was then placed over the reward) or not covered (towel removed) while they waited, and (2) if they would prefer the experimenter to leave the treats on the table or take them with her when she left the room (the experimenter placed the rewards behind her back at this point). Questions were counterbalanced. General self-regulation, encompassing a range of skills across a number of contexts, was measured using the Self-Control Rating Scale (Kendall & Wilcox, 1979). Low scores indicate good self-

control. A high Cronbach's alpha was obtained for this sample ($r = .94$).

The task used to evaluate delay of gratification was adopted from Mischel and Baker (1975). Children were offered a choice of two small rewards (e.g., two chocolates or one chocolate). After they had made their choice, children were informed that in order to receive the two chocolates they would need to wait until the experimenter returned (an undisclosed time of 15 minutes). If they decided not to wait, they could alert the experimenter to this at any time by giving an agreed upon signal (ringing a bell). The experimenter returned on the signal but the child then received only a single chocolate. A teaching and querying protocol was used to ensure that children understood the rules of the task (see, Cuskelly et al. 2003). There were a small number of children who did not like chocolate and alternatives were available for these children. All mothers were satisfied that their child liked what was offered before the tasks began. Delay time was the time (in seconds) from the end of the instruction to when the child rang the bell or violated the conditions by touching the item or leaving the room. If neither of these occurred, the experimenter returned after 15 minutes.

Procedure

Ethical approval for the study was obtained from the University of Queensland's Ethics committee. Parents and individuals with Down syndrome who were over 18 signed a consent form before being included in the study. All procedures were conducted in one of two small laboratories, both of which were devoid of decoration and contained one table and two chairs. Both had wall mounted video cameras for recording. Each room abutted another where the experimenter observed the participants on a monitor. For reasons of distance, three participants were unable to return for the second visit. These participants and their mothers completed all tasks on the first visit with the exception of the second trial of the delay task.

On the first visit, participants completed the PPVT-III, the EVT and then the delay task. During the delay task, participants were alone in the laboratory. On the second visit the young people with Down syndrome completed the SB:IV, the delay task, and the questions regarding their knowledge of delay rules. Understanding was checked prior to the second administration of the delay task. If there was any doubt about the participant's understanding, the teaching and querying procedure was repeated. Parents completed a demographic questionnaire, the Self-Control Rating Scale and the EASI III Temperament Survey on the first visit.

Results

A p value of .01 was set in order to reduce the chance of Type I error. Age was not significantly correlated with any of the waiting measures and sex of the participant was not significantly associated with waiting when tested using Mann Whitney U. These demographic variables were therefore ignored in further analyses.

On the first occasion, 11 adolescents waited until the experimenter returned (15 min.), eight waited less than one minute and another four waited less than two minutes. Of those who waited for 15 min on the first occasion, only one did not wait for the experimenter to return on the second trial. Mean values have reduced meaning under these circumstances but are included here in second(s) to allow comparison with other studies. The means were 332.38s ($SD = 383.60$), 407.28s ($SD = 412.14$), and 440.72s ($SD = 398.22$) for trial 1, trial 2, and the longest waiting time, respectively. Waiting times across occasions were significantly correlated ($\rho = .61$, $p < .001$). There was no significant difference between waiting times on the two occasions using Wilcoxon Signed Ranks test. Only two participants violated the rules of the experimental task and both did this only once.

As the waiting time data were not normally distributed, it was decided to use a group analysis for the remainder of the analyses with the group divided using a median split of the longest time waited over the two occasions (360s). There were 14 members of the group who waited 360s or longer and 15 in the group who waited less than 360s.

Independent samples t tests were used to test for differences between the groups (see Table 1). The group who waited had significantly higher expressive language scores, higher self-control and were less impulsive. Scores on the Self-Control scale were negatively correlated with scores on the Impulsivity and Emotionality temperament scales ($r = -.76$; $-.66$ respectively, both $p < .001$).

Table 1. Means (SDs) of groups who waited for 360 seconds or more and those who waited less than 360 seconds

	Waited less than 360s (n= 15)	Waited 360s or more (n=14)	t (df)
SB:IV (MA in months)	60.00 (14.21)	72.08 (15.94)	-2.04 (24)
PPVT-III (MA in months)	71.07 (19.85)	84.21 (10.87)	-2.19 (27)
EVT (MA in months)	57.53 (12.70)	75.78 (20.14)	-2.95 (27)*
Self-Control Scale ^a	130.58 (26.88)	99.95 (24.90)	3.18 (27)*
Emotionality	46.06 (5.35)	50.71 (7.05)	-2.01 (27)
Activity	37.87 (6.83)	42.07 (4.14)	-1.99 (27)
Sociability	12.80 (3.41)	13.29 (4.67)	-0.32 (27)
Impulsivity ^b	59.87 (6.52)	68.07 (7.88)	-3.06 (27)*

* $p < .01$

^a lower scores indicate higher self-control

^b higher scores indicate less impulsivity

Responses to the two questions examining knowledge of the benefits of not seeing the reward were inconsistent. Fifty-four percent preferred the chocolates to be covered while they waited, however only 14% said it would be better if they were removed from the room. Participants' responses to this question may have been a function of the trust they had that the researcher would, in fact, return with the chocolates. A crosstabs chi-square test was conducted to ascertain if there was a difference between the groups on preference for seeing the reward, using the covered or uncovered question. There was no significant difference between groups.

Logistic regression was used to ascertain if group membership could be reliably predicted from the independent variables. The full model, which contained the scores of the PPVT-III, the EVT, the Impulsivity scale and the Self-Control Scale, was significant, chi square (4, N= 29) = 15.46, $p < .01$, $r^2 = .41$). Prediction of the group who waited for 360s or more was 85.7% correct, for the group who waited less than 360s it was 86.7% and the overall prediction was correct at 86.2%. No variable was independently significant (see Table 2).

Table 2. Logistic regression analysis of waiting time as a function of language ability, temperament, and self-control

Variable	B	Standard error	Wald test	Exp (B)	Significance
EVT	0.04	0.05	0.88	1.04	ns
PPVT-III	0.04	0.05	0.76	1.04	ns
Impulsivity	0.11	0.10	1.15	1.12	ns
Self-control	- 0.03	0.03	0.89	0.97	ns
Constant	- 9.72	10.11	0.93	0.00	ns

Discussion

There was great variation in the abilities of these young adolescents to delay gratification. A substantial proportion (38% - 36% if we include the young participant who was unable to be included in the study) waited for the experimenter to return on the first occasion. In contrast, 28% waited less than a minute. There was consistency in responses across the two occasions indicating reasonable task reliability.

The participants in this study waited longer than those in the investigation reported by Cuskelly et al. (2003) who found that 64% of their substantially younger group waited less than a minute. Cuskelly et al. (2001) who worked with adults with Down syndrome had approximately the same proportion who waited for the experimenter to return (35% on the first occasion and 48% on the second occasion). These authors did not report the number who waited less than a minute. Mean waiting times for the three studies reflect these relativities suggesting a developmental progression with age.

What is clear, however, is that there is a group of individuals with Down syndrome who have great difficulty waiting, even at a mental age beyond that when typically developing children are able to wait. It is incorrect to interpret this difficulty with waiting as a general difficulty for individuals with Down syndrome, however, since many individuals could wait consistently. The question then becomes, why do some wait and others do not?

The data reported here support the view that language ability plays some part in the capacity to delay gratification. Those who waited longer had expressive language skills that were significantly higher than those who did not wait supporting Luria's (1961) and Vygotsky's (1962) contention that language plays a central role in self-regulation. The asynchrony

of expressive language and mental age that occurs in those with Down syndrome (Chapman & Hesketh, 2000) allows this analysis to be undertaken, something not possible with typically developing children.

As expected, temperament was also found to be associated with delay, with children who were perceived to be less impulsive waiting longer. Children who were rated by their mothers as having a high level of self-regulation across a range of contexts were also rated as having low impulsivity and emotionality. Emotionality, as measured by the EASI-III temperament scale encompasses negative responses to frustration. The data from this study provide some support for the speculation that self-regulatory skills and/or difficulties may be generalized. For example, difficulty in the area of emotion regulation may be associated with self-regulatory difficulty in tasks requiring self-control of behaviour. This interpretation is supported by the association between delay of gratification and the self-control scale.

There was little consistency in participants' responses to the two questions aimed to elicit information about knowledge of delay rules. As noted above, one of the questions may have been confounded by issues of trust; however, correct responses to the other question did not appear to contribute to individuals' ability to delay. It is possible that a number of the participants did not believe they could act on this knowledge, for example, by moving the treats to a place where they could not see them, and thus their knowledge of effective strategy was not used.

The combined data were able to predict the wait/non-wait groups with a high degree of accuracy, however no one variable was significant when the influence of the other variables was taken into account. Not surprisingly, the capacity to delay gratification has multiple determinants, with a range of personal attributes contributing to this high level skill.

The small numbers in the study may have meant that some associations between delay and other variables were not identified. The study focused solely on child attributes, however, it has been established that environmental characteristics such as parental approaches to child rearing are also influential in the development of this skill (Houck & LeCuyer-Maus, 2004). The role of environmental variables in developing self-regulation in children with Down syndrome has not been explicitly tested, therefore, an examination of these variables as they interact with child language and temperament would provide a more sophisticated understanding of the development of this important life skill.

Acknowledgements

The authors would like to thank the adolescents who participated in this study, and their families for their assistance.

References

- Buss, A. H., & Plomin, R. (1975). *A temperament theory of personality traits*. New York: Wiley-Interscience.
- Chapman, R. S., & Hesketh, L. J. (2000). Behavioral phenotype of individuals with Down syndrome. *Mental Retardation and Developmental Disabilities Research Review*, 6, 84-95.
- Cuskelly, M., Einam, M., & Jobling, A. (2001). Delay of gratification in young adults with Down syndrome. *Down Syndrome Research and Practice*, 7, 60-67.
- Cuskelly, M., Zhang, A., & Gilmore, L. (1998). The importance of self-regulation in young children with Down syndrome. *International Journal of Disability, Development and Education*, 45, 331-341.
- Cuskelly, M., Zhang, A., & Hayes, A. (2003). A mental age matched comparison study of delay of gratification in children with Down syndrome. *International Journal of Disability, Development and Education*, 50, 239-251.
- Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test – Third Edition*. Circle Pines, MN: American Guidance Service.
- Funder, D. C., Block, J. H., & Block, J. (1983). Delay of gratification: Some longitudinal personality correlates. *Journal of Personality and Social Psychology*, 44, 1198-1213.
- Houck, G. M., & LeCuyer-Maus, E. A. (2004). Maternal limit setting during toddlerhood, delay of gratification, and behavior problems at age five. *Infant Mental Health Journal*, 25, 28-46.
- Kendall, P. C., & Wilcox, L. E. (1979). Self-control in children: Development of a rating scale. *Journal of Consulting and Clinical Psychology*, 47, 1020-1029.
- Kopp, C. (1990). The growth of self-monitoring among young children with Down syndrome. In D. Cicchetti, & M. Beeghly (Eds.), *Children with Down syndrome: A developmental perspective* (pp. 231-251). Cambridge: Cambridge University Press.
- Luria, A. R. (1961). *The role of speech in the regulation of normal and abnormal behaviour*. London: Pergamon Press.
- Mischel, H. N., & Mischel, W. (1983). The development of children's knowledge of self-control strategies. *Child Development*, 54, 603-619.
- Mischel, W., & Baker, N. (1975). Cognitive appraisals and transformations in delay behavior. *Journal of Personality and Social Psychology*, 31, 254-261.
- Mischel, W., & Ebbesen, E. B. (1970). Attention in delay of gratification. *Journal of Personality and Social Psychology*, 16, 329-337.

- Rodriguez, M. L., Mischel, W., & Shoda, Y. (1989). Cognitive person variables in the delay of gratification of older children at risk. *Journal of Personality and Social Psychology*, *57*, 358-367.
- Shoda, Y., Mischel, W., & Peake, P.K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification. *Developmental Psychology*, *26*, 9768-986.
- Silverman, I. W., & Ragusa, D. M. (1990). Child and maternal correlates of impulse control in 24-month old children. *Genetic, Social and General Psychology Monographs*, *116*, 437-473.
- Thorndike, R. L., Hagan, E. P., & Sattler, J. M. (1986). *The Stanford-Binet Intelligence Scale: Fourth Edition*. Chicago: Riverside Publishing.
- Vygotsky, L. S. (1962) *Thought and language*. Cambridge: MIT Press and Wiley.
- Williams, K. T. (1997). *Expressive Vocabulary Test*. Circle Pines, MN: American Guidance Service.

Correspondence

Monica Cuskelly
School of Education
The University of Queensland
Brisbane, QLD 4072
Australia

m.cuskelly@uq.edu.au