The Importance of Self-Regulation in Young Children With Down Syndrome

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ABSTRACT
Adulthood brings with it responsibilities for making choices and decisions about one's own life. Individuals with Down syndrome, their parents and communities, have begun to expect that at least some of these responsibilities will be met by the person with Down syndrome. This will require a range of skills in managing one's own behaviour and these skills will need to be acquired in childhood. The Down Syndrome Research Program has begun a number of investigations into two important aspects of self-regulation-the capacity to delay gratification and master motivation. This paper describes the importance of these skills and habits of behaviour to those with Down syndrome and discusses the research to date.

Introduction
Expectations about the life course for children with Down syndrome and those with other intellectual disabilities have changed substantially over the past two decades (see Stratford & Gunn, 1996). Many families and service providers now assume that those with Down syndrome will move out of the family home, at a time appropriate for them, and into an independent living situation (Brown, 1996; Parmenter, 1996). Such a move brings with it many new choices and responsibilities for the individual such as deciding what and how much to eat, whether to engage in regular exercise, which clothes to buy, whose company to keep. In order to fulfill these responsibilities adults will need to be able to set their own goals (e.g., staying healthy) and to manage their own behaviour so that they maximise their chances of success in meeting their goals. The ability to regulate one's own behaviour is the marker of the adult and we see its gradual emergence throughout childhood and adolescence, and in many individuals it continues to develop even into young adulthood.

Self-regulation is the term used to indicate individuals' ability to manage their own behaviour so that they attain their goals (Bandura, 1986). It has a central place in the development of the skills and competencies required for learning (Whitman, 1990) and, as the examples above illustrate, it affects many aspects of life. It is clearly a very complex skill incorporating behavioural, cognitive, and motivational components (Kendall, 1990) and is one of the most important developmental achievements.

There are many descriptions of self regulation in the literature, however, the essential aspects include setting one's own goals, applying appropriate strategies to meet those goals, and monitoring and evaluating one's performance (Bandura, 1986). These tasks require self-observation, some judgement about the competence of one's performance, and some evaluative response (Bandura, 1991). Self-regulation, therefore, requires a consciousness of self, the belief that the self is an active agent, and an understanding of one's capabilities.

There are a number of subfunctions which need to be developed and mobilized if individuals are to initially acquire and then benefit from a capacity to self-regulate (Bandura, 1991, p. 249; italics added). It requires certain skills (e.g., the capacity to delay gratification), the use of particular strategies (e.g., self-reinforcement), and certain habits of behaviour (e.g., responding positively to challenge). Little is known about the ways in which the development of self-regulation occurs although it is clear it is a gradual process. Both parental behaviours and child characteristics have been found to be related to the development of early skills considered to be part of the subfunctions of self-regulation (Kopp, 1990; Vaughn, Kopp, & Krakow, 1984). Kopp (1991), who sees the acceptance of social norms as one marker of self-regulation in preschool aged children, argues that it begins with the parent taking full responsibility for the child's behaviour and ends with the child accepting complete responsibility. The changeover between these two end points takes a number of years and many experiences.

Why is Self-Regulation Important for Those With Down Syndrome?
Self-regulation is important for all persons, irrespective of whether or not they have Down syndrome,
however it seems that it may be an area of weakness for those with an intellectual disability. Whitman (1990) argued that the central problem for those with an intellectual disability is their inability to self-regulate. Although many other researchers in the field would feel that Whitman's position is extreme, most acknowledge that self-regulation is an important concern when considering intellectual disability (see e.g., Baer, 1990; Kendall, 1990). Children with Down syndrome may be particularly vulnerable to difficulty in developing self-regulatory behaviour as a number of theorists have suggested that self-regulation requires the use of language (Kopp, 1982; Luria, 1961; Vygotsky, 1962), an area of difficulty for many children with Down syndrome (Fowler, 1990; Gunn & Crombie, 1996). Children with Down syndrome have been found to do less well on tasks requiring them to inhibit behaviour (a self-regulatory task) than comparison children matched for developmental age (Kopp, Krakow, & Johnson, 1983).

In the research program at the Fred and Eleanor Schonell Special Education Research Centre we have chosen to focus our interest in two areas: Children's capacity to delay gratification when they have set their own goal (self-imposed delay of gratification) and mastery motivation. Capacity to manage one's own behaviour in order to attain a self-established goal clearly taps into the area of self-regulation. Mastery motivation is seen to be a precursor to the development of this later capacity as it is only through persistent effort, even in the face of failure, that the skills necessary to manage one's own behaviour are acquired. The following section focuses on these two areas of development.

Self-Imposed Delay of Gratification

Individuals who are able to delay gratification can choose to forfeit an immediate goal in order to obtain a preferred goal which is more distant in time, and can apply strategies to ensure the goal is reached. In other words, individuals can resist immediate temptation and wait for what they really want. There are two critical elements to this definition: the first is the decision to wait and the second is the employment of strategies which enable effective waiting. Mischel and his colleagues (Mischel, 1974; Mischel & Metzner, 1962) developed the experimental procedures used to examine this capacity. These procedures involve presenting a child with a choice: a favoured outcome is available only after waiting or a less preferred outcome can be had immediately.

Bandura's (1986) definition, outlined above, makes the relationship between the ability to delay gratification and self-regulation very evident. The capacity to delay gratification has been identified as one of the most important skills in self-regulation (Logue, King, Chavarro, & Volpe, 1990) and is regarded as a necessary component of socialisation and of emotional adjustment (Krueger, Caspi, Moffitt, White, & Stouthamer-Loeber, 1996; Mischel, 1974). The ability to delay gratification at around 4 years of age has been found to be predictive of both cognitive and social competence at adolescence in children who are developing normally (Mischel, Shoda, & Rodriguez, 1989; Shoda, Mischel, & Peake, 1990).

The ability to delay gratification comprises a number of elements, not least of which is the ability to decide to wait. Children with an intellectual disability have been reported to have difficulty with making this choice (see Litrownik, Franzini, Geller, & Geller, 1977). There are developmental aspects to the ability to delay gratification which suggest that developmental age matching is more appropriate than matching by chronological age, although children with Down syndrome were found to differ on an externally imposed delay task even in comparison to a developmental age matched group and to a language age matched group (Kopp, Krakow, & Johnson, 1983). Language competence is a likely contributor to the difficulty children with an intellectual disability have with the self-imposed delay task. In order to make the decision to wait the child has to know the meaning of the word wait, to have some concept of time, and, finally, to understand the contingency relationship between waiting and getting what you want. Rodriguez, Mischel, and Shoda (1989) found a direct relationship between the receptive language abilities of children without intellectual disability and waiting time on a self-imposed waiting task and Vaughn, Kopp, and Krakow (1984) also reported such a relationship for externally imposed waiting.

There appear to be few studies which have investigated the behaviour of children with Down syndrome with respect to the initial decision to wait and even fewer which have then examined the strategies children who chose to wait use to assist themselves achieve their goal. This is an omission which needs to be rectified as it is clear that we need to know if children with Down syndrome can wait in order to achieve their goals, whether they acquire this skill at approximately the same mental age as children who are developing normally, and what strategies are most effective in supporting their desire to wait. In addition, research needs to ascertain if there are particular behavioural patterns or parenting strategies which appear to assist in the development of the capacity to successfully self-impose a decision to delay gratification in children with Down syndrome.

Investigations of the relationship of maternal interactions to children's capacity to perform on externally imposed delay of gratification tasks (e.g., children are told not to touch an attractive stimulus until given permission) found that children's ability to delay was positively correlated with their mothers' self-reported encouragement of independence (Silverman & Ragusa, 1990). Personal characteristics are also identified as important in the development of self-regulation. One such characteristic may be mastery motivation which is the term used to describe the determination to be successful in the face of challenge.
Mastery Motivation

White (1959) wrote an influential paper in which he suggested that all human beings are born with an urge towards competence and that, although not initially dependent upon external reinforcement, efforts toward mastery are reinforced by feelings of pleasure from an early age. Children respond with pleasure as they practise and master new skills (Redding, Morgan, & Harmon, 1988) and the pleasure derived from mastery efforts acts to ensure that children will continue to strive to acquire increased competency and to approach tasks requiring new or advanced skills (Mayes & Zigler, 1992).

An orientation to mastery is associated with a positive attitude toward learning (Ames & Archer, 1988) and mastery behaviours have been found to be significant predictors of cognitive competence (Jennings, Yarrow, & Martin, 1984; Messer et al., 1986). Mastery motivation is typified by curiosity and a desire to explore (Brockman, Morgan, & Harmon, 1988), a preference for challenging tasks and increased persistence (Brockman et al., 1988; Elliot & Dweck, 1988). Csikszentmihalyi (1990) has also written about the pleasure of achievement, suggesting that pleasure and challenge are interlinked. Progress is made because individuals increase the demands they make on themselves as they become more skilled in order to ensure they continue to be challenged.

Harter (1978) reported that, unlike normally developing children who show pleasure when they succeed on a moderately challenging task, children with an intellectual disability displayed more pleasure when successful at easy tasks. She hypothesised that children who had many experiences of failure and who were not reinforced for their attempts would be more dependent on reinforcement from external sources, rather than finding them intrinsically reinforcing. She concluded that the urge toward competent behaviour is a precursor for the acquisition of self-regulatory behaviour and that experience of too much failure, on the one hand, or lack of challenge, on the other, may disrupt the development of self-regulation.

Mastery motivation in children with Down syndrome.

Wishart and Duffy (1990) examined the stability of cognitive performance in children with Down syndrome and found that almost all the children included in the study were under-performing. Many failures to score on a test item were the result of refusing to attempt the item rather than through poor performance. Other studies (e.g., Morss, 1985, Wishart, 1993) have found that children with Down syndrome display unstable performance. Wishart and Duffy suggested that “slow development' theories may not adequately describe cognitive development in young children with Down syndrome” (p. 10) and turned to motivational factors as a possible explanation of the cognitive deficits displayed by these children.

Several studies have attempted to directly address the question of mastery motivation in children with Down syndrome. The majority have concluded that there are differences between children with Down syndrome and normally developing children. Children with Down syndrome demonstrate lower levels of task engagement (Ruskin, Mundy, Kasari, & Sigman, 1994), slower latencies to task involvement (Vietze, McCarthy, MacQuiston, MacTurk, & Yarrow, 1983), less frequent displays of task pleasure (Dunst, 1981; Harter & Zigler, 1974; Ruskin et al., 1994), and prefer easy over mildly challenging tasks (Schwethelm & Mahoney, 1986).

Persistence, which has been identified as a key aspect of mastery motivation (Jennings et al., 1988), has been nominated as an area of weakness in children with Down syndrome (Gunn & Berry, 1985; Gunn & Cuskelly, 1991). MacTurk, Vietze, McCarthy, MacQuiston, and Yarrow (1985) found a behavioural loop existed between persistence and success for infants who were developing normally and for infants with Down syndrome. This finding highlights the possible vulnerability of children with intellectual disability to experience diminished mastery motivation, as the ratio of success to effort is lower than for children developing normally. For example, it is very likely that hypotonia, common in children with Down syndrome (Jobling, 1996; Reid & Block, 1996), impedes the early understanding of the relationship between movement and effect-one of the first learning experiences. Schwethelm and Mahoney (1986) questioned whether persistence was a useful measure of mastery motivation for this group as they may have already learned that persistence does not lead to success on difficult tasks.

The environment of young children with Down syndrome may also fail to support the development of mastery motivation. In their discussion with the mothers of children with Down syndrome, Vietze et al. (1983) discovered that at least some of the children rarely interacted with toys, and in response to the children's lack of interest, mothers ceased providing them with the opportunity. The authors hypothesised that differences in timing (i.e., the children with Down syndrome took longer to begin to engage with the toys) interfered with the communication between the parent and the child about her/his interest in the toy. The longer processing times of children with Down syndrome (O'Brien & Hayes, 1995) could also interfere with the communication patterns between parent and child, at least until the parent understands the limitations of the child in this respect.

Wishart (1996) has presented evidence that children with Down syndrome respond differently to cognitive challenges in comparison to children who are developing normally. She found that children with Down
Aspects of caregiver behaviour, detailed below, have been identified as important in the development of Bates, & Kaskie, 1992) and is likely to have a major impact on the development of mastery motivation. There is evidence that the quality of early caregiving is associated with later cognitive competence (Olson, 1977; Mahoney, Fors, & Wood, 1990; Mahoney & Robenalt, 1986; Stevenson, Leavitt, & Silverberg, 1985) and some authors suggest that this may be implicated in the lower levels of mastery motivation seen in children (e.g., Jobling, 1996). This needs to be investigated empirically particularly as Hauser-Cram (1993) found that higher levels of maternal interaction acted to reduce mastery motivation in these children. A number of studies that have examined mother-child interaction have found that the mothers of children with Down syndrome are likely to take the initiative for a disproportionate amount of the time (Jones, 1977; Mahoney, Fors, & Wood, 1990; Mahoney & Robenalt, 1986; Stevenson, Leavitt, & Silverberg, 1985) and some authors suggest that this may be implicated in the lower levels of mastery motivation seen in these children (e.g., Jobling, 1996). This needs to be investigated empirically particularly as Hauser-Cram (1996) found that maternal didactic behaviour had a positive effect on the ability of children with disabilities to solve the tasks and on their persistence at those tasks.

Heckhausen (1993) suggested that children develop mastery motivation through the development of an awareness of behaviour-effect relationships into which they are induced by caregivers. The infant strives to produce effects and is successful with guided assistance from the caregiver. The caregiver provides an emotionally positive setting and shares the child's goals so that the goals become mutual. This is probably accomplished by parents adopting the one-step-ahead approach-carers assist children to develop skills by encouraging attempts to master tasks at one level higher than last demonstrated (Heckhausen, 1987). The Vietze et al. (1983) finding discussed above could indicate that mothers of children with Down syndrome provide a less than optimum environment for their children because they fail to adjust their behaviours to their children's slower timetables. It is also probable that this lack of synchronicity decreases with time as mothers learn the "rhythm" of their new babies. The impact on mastery motivation of asynchronous interactions in the first few years of life are unknown but it seems likely that they would contribute to the accumulation of failure experiences alluded to by Harter (1981).

Maternal interaction.
The role of the caregiving environment in the development of mastery motivation has become one of the central foci of recent research (Busch-Rossnagel, Knauf-Jensen, & DesRosiers, 1995; Heckhausen, 1993). There is evidence that the quality of early caregiving is associated with later cognitive competence (Olson, Bates, & Kaskie, 1992) and is likely to have a major impact on the development of mastery motivation. Aspects of caregiver behaviour, detailed below, have been identified as important in the development of mastery motivation. Studies with normally developing children have generally found that amount and variety of stimulation is associated with increased mastery motivation (e.g., Barrett, & Maslin-Cole, 1993; Yarrow, Morgan, Jennings, Harmon, & Gaither, 1982), however, a study of children with Down syndrome (Hauser-Cram, 1993) found that higher levels of maternal interaction acted to reduce mastery motivation in these children. A number of studies that have examined mother-child interaction have found that the mothers of children with Down syndrome are likely to take the initiative for a disproportionate amount of the time (Jones, 1977; Mahoney, Fors, & Wood, 1990; Mahoney & Robenalt, 1986; Stevenson, Leavitt, & Silverberg, 1985) and some authors suggest that this may be implicated in the lower levels of mastery motivation seen in these children (e.g., Jobling, 1996). This needs to be investigated empirically particularly as Hauser-Cram (1996) found that maternal didactic behaviour had a positive effect on the ability of children with disabilities to solve the tasks and on their persistence at those tasks.

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Where Should Research Be Heading?
There are two questions that require immediate attention, although both are of such complexity that it will be some time before answers are available. We need to gather information about the development of the ability to manage one's own behaviour, particularly in children with Down syndrome. What skills, strategies, and habits of behaviour are involved in the gradual progression from a dependent person to a self-regulating person, and what experiences are important in supporting or constraining this development? The second important question springs from this-what can parents and teachers do that assists children along this route?
It is clear that children’s sense of their own competence is developed or undermined by their experiences from an early age and that their motivation to learn is affected by these early experiences.

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**References**


