Typical Development of Eye Contact

• Eye contact behavior (i.e. reciprocal or fixated eye-to-face gaze) first develops in infants as early as 4 weeks (Mirenda, Donnellan, & Yoder, 1983).

• Research also suggests that early eye gaze behavior, specifically in infants, may be a part of the foundation skills required to later build nonverbal and verbal social or communication behaviors (Mirenda et al., 1983).

We now have friends and clients coming to us who notice a delay in their baby’s eye contact and ask us to help them to teach it. People are vast becoming aware that this is a big link to language delay and are asking for assistance to address this so as other delays don’t occur. We have had three babies under four months old in the past year, and two babies under fifteen months old. All children have had the issue of eye contact and other social and communicative behaviours addressed successfully within three months of commencing teaching. We feel it is our responsibility as behaviour analysts to raise this awareness.

Early in infancy, dyadic eye contact is associated with normal development. It is also speculated that dyadic eye contact helps infants to manage and regulate face-to-face social interactions (Arnold, Semple, Beale, & Fletcher-Flinn, 2000).

Dyadic eye contact continues to develop throughout an infant’s lifetime. When infants reach about 6 months in age, triadic eye gaze develops. Triadic eye gaze involves joint attention. (Arnold et al., 2000).

• Dyadic eye contact is important to development of other verbal and nonverbal social behaviors, however it is suggested that triadic eye gaze may be vital for the acquisition of language (Arnold et. al 2000)

Ultimately, eye contact or gaze behavior serves many functions leading into adulthood.

• For example, eye contact may serve as an indicator of interest, to obtain information about another’s reaction, regulation of turn taking during conversation, and to indicate difficulty understanding what is being said. (Mirenda, 1983)
Development of Eye Gaze/Contact Behavior in Children with Autism

- Lack of or active avoidance of eye contact or eye-to-face gaze is one of the most noticeable deficits in children with autism (Mirenda et al., 1983).

- It is retrospectively reported by mothers of children with autism that as infants they did not notice a difference in the eye contact of their children (Mirenda et al., 1983).

Only later, as the children aged and eye contact and eye-to-face gaze become necessary to engage in more reciprocal social behaviors, was it apparent that there was a behavior deficit in this area (Mirenda et al., 1983).

Many researchers have hypothesized the source of this behavioral deficit. Mirenda et al. (1983) reviewed some of these hypotheses:
- Some researchers hypothesized that an avoidance of eye contact is the foremost deficit in autism. The main cause of this deficit is the prevention of social bonding due to parental pressure and anxiety.
- Other researchers have suggested that due to the high level of arousal in children with autism they may avoid the gaze to keep their level of arousal down.
- To date only a few studies have offered a behavioral analysis of the development of social communicative eye contact in children with autism.

It has been suggested that eye contact and the control of the gaze of others serves an important social function before vocal responding develops in young children (Stern, 1974, 1985).

- These early communicative behaviors seem to be precursors to language acquisition that ultimately lead to more sophisticated social and verbal responding (Bloom & Lahey, 1978).

Failure to develop eye contact in the early years may ultimately affect the development of language and social behaviors later in life. (Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996)

- Lack of eye contact in children with autism may also affect how others react to the child.
- For example, low rates of eye contact has led to the conclusions that children with autism are aloof, abnormal, impersonal or detached (Hutt & Ounstead, 1966)

In addition to the social consequences of poor eye contact it appears there are educational concerns associated with poor eye contact.
• Kozloff (1974) suggested that educational gains may be reduced when children with autism fail to attend to the their teachers and their instructional demands. He suggested that eye contact should occur before instructional demands are delivered to insure the child is attending to the teacher.

• Lovaas (1977) concurred with this analysis and therefore his early curriculum stressed the development of eye contact mainly for educational reasons.

• Greer and Ross (2007) stress the teaching of eye contact with children with autism as a primary attentional skill early in an instructional program.

We now know when to teach eye contact and how to teach it: within MO

Methods to Teach Eye Contact to Persons with Autism and Developmental Disabilities.

• Since the 1960’s, educators and clinicians have generally focused on interventions to teach eye contact behavior before teaching other behaviors (Mirenda et al., 1983).

• Most of the research in this area has relied upon the behavior analytic principles to guide the interventions

Early attempts to develop eye contact in children with autism using behavior analytic methods generally included the presentation of nonverbal and verbal prompts to look at the experimenter for a designated period of time followed by the delivery of a putative reinforcer for the eye contact behavior (Greer & Ross, 2007; Lovaas, 1981; Maurice, Green & Luce, 1996) and overcorrection for failure to make eye contact following a verbal prompt (Foxx, 1977).

• These procedures were usually implemented while sitting at an instructional table and using the methods of instruction discrete trial instruction.

In some reports the authors also prompted the eye contact response by holding a reinforcing item at eye level (Greer & Ross, 2007; Hwang & Hughes, 1995).

• Other prompting procedures included physically guiding the child’s head to look at the researcher (Greer & Ross, 2007; Hegelson, Fantuzzo, Smith & Barr, 1989).
• While these early studies clearly increased eye contact in children with autism there appeared to be limited generality to other persons and settings (Fay & Schuler, 1980; Wing, 1976).

Giving what we know now, it is no surprise that the above methods failed to generalize to other settings! We should never hear a child with autism being told, “look at me!”, “great looking” etc.

Other researchers have attempted to teach eye contact within the context of social interaction.
• Klinger and Dawson (1992) were one of the first researchers to use a social interactive training model to increase eye contact. This model did not use verbal or nonverbal prompts to increase eye contact but instead attempted to increase within the context of social activities.
  – This model included a package of treatments that included time delay, contingent imitation, use of relevant reinforcers, and environmental arrangements of enjoyable activities.

• Hwang & Hughes (1995,2000) demonstrated that this method successfully increased eye contact in children with autism

Other researchers including Berler, Gross and Drabman, 1982; Charlop and Walsh, 1986; Goldstein, Kaczmarek, Pennington and Shafer, 1992; Hegelson et al.,1989; Koegel and Frea, 1993; and Tiegerman and Primavera, 1983 demonstrated that eye contact could be increased through modified forms of social interactive training.

• Despite these efforts the social interactive methods have produced at best minimal and somewhat mixed effects in developing eye contact with children with autism (Hwang & Hughes, 2000).

• These researchers suggested that the reinforcers programmed for the eye contact response may have been too weak to maintain the response.

A Behavioural Analysis of Eye Contact During Language Training

• Children with autism frequently fail to develop eye contact as an important social communicative behavior. (Koegel & Frea, 1993) Social communicative behaviors are those that typically accompany a speaker’s verbal behavior, e.g. eye contact, facial expressions, etc.
• A behavioral analysis of eye contact during some verbal exchanges suggests that the sight of another’s face and eyes in particular, may act as a reinforcer for behaviors that precede it and a discriminative stimulus for responses that follow it.

• For example, many verbal and nonverbal responses are reinforced, punished, or extinguished by the facial responses or eye contact of others.

• Moreover, the occasion of eye contact evokes many responses. For example, we generally don’t make a request of another person when they are not looking at us.

Skinner (1957) defined verbal behavior as behavior whose reinforcement is mediated by another person or a listener.

• Consequently most audible verbal behavior quickly comes under the stimulus control of a listener since the presence of a listener is correlated with the availability of reinforcement for the response.

• In addition, subtle aspects of the behavior of a listener may come to control the emission of some verbal responses.

• For example, the mand is reinforced when a listener’s behavior is effectively controlled to produce reinforcement specific to the relevant motivating operation for the speaker.

• A mand for water is only reinforced when a listener’s behavior is effectively controlled to deliver water to the speaker.

• Consequently, listener’s who appear to be “attending” to a speaker are more likely to have their behavior more controlled by the verbal behavior of a speaker.

• Therefore, mands that are accompanied by an attending response by a listener in the form of eye contact are more likely to result in reinforcement for a speaker.

The history of a successful “mander” may account for the following sequence of events:

• When an MO occurs and a mand response is about to be emitted eye contact with another person may be momentarily conditioned as a reinforcer and therefore evoke movements of the head and eyes of speaker so as to produce eye contact with a listener.

• The occurrence of the MO within a context in which eye contact is not occurring is a transitive conditioned motivating operation (CMOT) that momentarily and conditionally conditions the sight of the listener’s eyes as a form of reinforcement. (Michael, 1993)

• Consequently, head and eye movements of the speaker that produced eye contact will be strengthened.
• The eye contact with a listener is now discriminative for the availability of reinforcement for certain verbal responses and therefore evokes the mand response.

• In everyday language, speakers learn that when a listener is making eye contact with them they are more likely to get what they ask for. Therefore, they will attempt to make eye contact before manding.

It may be that the repertoire of children with autism does not easily come under the control of these contingencies during early language acquisition.

• Therefore, eye contact of others serves neither the reinforcing nor discriminative functions for children with autism.

• It would seem that procedures that alter the reinforcing and discriminative functions of eye contact for children with autism might effectively address this important social deficit.

Remember that if we wait for eye contact before placing a demand, we are in fact punishing eye contact! If we expect our child with autism to look at us before we tell them off, we are not increasing the future likelihood of them making eye contact!

The Potential Role of the Mand In Teaching Eye Contact

• One of the first social initiated verbal responses by all children is the mand (Skinner, 1957)

• Mand responses tend to produce the strongest form of reinforcement since the response is only strengthened by reinforcement specific to the relevant MO.

• Consequently the mand response may be the appropriate response with which to begin the process of teaching eye contact

The Role of Time Delay Procedures

• Time delay has been successfully implemented to increase the spontaneous responding of children with autism (Charlop, Schreibman, & Thibodeau, 1985; Charlop & Trasowech, 1991; Charlop & Walsh, 1986; Halle, Baer, & Spradlin, 1981; Halle, Marshall, & Spradlin 1979; Ingenmey & Van Houten, 1991; Matson, Sevin, Box, & Francis, 1993; Matson, Sevin, Fridley, & Love, 1990; Tincani, 2004).

• This procedure has been effective in mainly increasing the spontaneous requesting repertoire of children with language delays and disorders.
• It is an effective method of stimulus control transfer since it helps to eliminate the use of prompts for the desired response.

Consequently, time delay procedures might be useful in decreasing the need for verbal and nonverbal prompts for eye contact responses. In everyday terms, our children can learn to look at someone when they talk to them because they were more responsive when the child did so.

A time delay procedure can be used to avoid the use of a prompt to produce the first instances of eye contact.

• Because your child already has a history of reinforcement for all vocal mands without eye contact, the time delay procedure will function as a form of extinction when eye contact was required for reinforcement of the mand.

• One of the products of extinction is that the previously reinforced response may continue to occur and sometimes with greater intensity during the extinction phase. (Lerman & Iwata, 1996). Your child may continue to produce the vocal mand and with greater intensity in terms of an increase in volume during extinction.

In addition, extinction may also produce response variability in the repertoire. (Lerman & Iwata, 1996) As a result, extinction of the mands during the early phases of the may produce the novel response of moving of the head and eyes in the direction of the teacher’s producing a clear occasion of eye contact.

• If such things as this happen (ie appropriate and desired behaviours), as soon as this occurs immediately deliver the reinforcer and maintain the vocal mand and simultaneously select the eye contact response through direct reinforcement.

• After several occurrences of this sequence early in the treatment phase the sight of the face of the teacher will become a reinforcer when a motivating operation is in effect for an item or activity that could not be obtained without eye contact and a mand.

Consequently, eye contact and simultaneous production of a vocal mand will begin to occur at high frequency. This is how we all learn to make eye contact when talking!

• This effect is more easily produced in the context of manding and therefore provides support for initially teaching eye contact during manding opportunities.

• Moreover, teaching within the context of manding brings a learner’s functional behavior of social initiation under the discriminative control of eye contact.

• This procedure may suggest a starting point for teaching important social pragmatic skills to children with autism.
Research references for teaching eye contact


