Early social responding and higher social cognition:
A behaviour analysis and sequence of skills

Francesca degli Espinosa, Ph.D., BCBA-D
Alphabee online live course, March 2021

Sessions 1 and 2

- Social Behaviour

- Social Contingency

- Social Learning

- Early social responses

- Organisation of teaching and activities

Sessions 3 and 4

- Social cognition

- Theory of Mind

- Verbal behaviour analysis of Theory of Mind

- Teaching sequence from descriptions to false belief understanding: private events, inferencing, problem solving

Housekeeping

- You can ask questions and make comments throughout the presentation using the chat. I may ask you to turn on your microphone occasionally to have a conversation and further clarify

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A short digression

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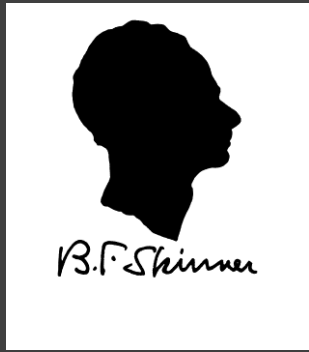The B. F. Skinner Foundation Community

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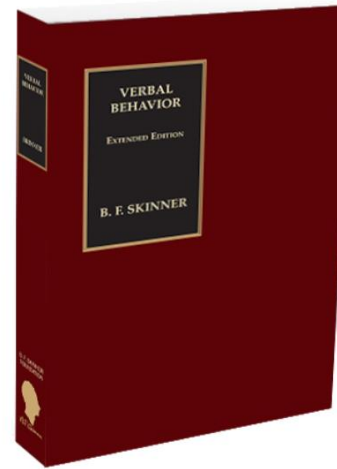
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Developing early social responding

Topics

- Early social and language development in children
- Intervention challenges in autism
- Establishing early social responses in autism

Behavioral interventions, including antecedent (e.g., prompting, environmental modifications) and consequent (e.g., reinforcement, extinction) strategies, is the largest category of Established Interventions for individuals under age 22 years and the only category of Established Interventions for those age 22 years and older as reported in the NSP2.[7]

REVIEW

Early comprehensive behaviorally based interventions for children with autism spectrum disorders: a summary of findings from recent reviews and meta-analyses
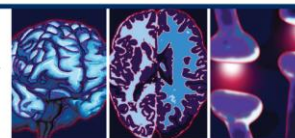
Iliana Magiati*[1], Xiang Wei Tay[1] & Patricia Howlin[2]

Practice points

- Evidence from recently published meta-analyses, systematic reviews and empirical studies supports previous conclusions that, for children with autism spectrum disorders, early intensive comprehensive interventions, largely based on applied behavior analysis principles, are generally more effective in improving cognitive, language and, to some extent, adaptive behavior skills than standard care or 'eclectic' interventions.

CLINICAL REPORT Guidance for the Clinician in Rendering Pediatric Care

American Academy of Pediatrics
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Identification, Evaluation, and Management of Children With Autism Spectrum Disorder

Susan L. Hyman, MD, FAAP,[a] Susan E. Levy, MD, MPH, FAAP,[b] Scott M. Myers, MD, FAAP,[c] COUNCIL ON CHILDREN WITH DISABILITIES, SECTION ON DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS

Evidenced-Based Interventions for Children With Autism Spectrum Disorder

Meredith N. Will, Kristn Currans, Jennifer Smith, Stephanie Weber, Amie Duncan, Jenny Burton, Kimberly Kroeger-Geoppinger, Valerie Miller, Megan Stone, Lindsay Mays, Ashley Luebrecht, Anna Heeman, Craig Erickson and Julia Anixt*

"Most evidence-based treatment models are based on principles of ABA."

Sitting at the science table

CrossMark

ORIGINAL PAPER

Preschool Deployment of Evidence-Based Social Communication Intervention: JASPER in the Classroom

Ya-Chih Chang[1] · Stephanie Y. Shire[2] · Wendy Shih[2] · Carolyn Gelfand[3] · Connie Kasari[2]

Randomized, Controlled Trial of an Intervention for Toddlers With Autism: The Early Start Denver Model

AUTHORS: Geraldine Dawson, PhD,[a,b,c] Sally Rogers, PhD,[d] Jeffrey Munson, PhD,[e,f] Milani Smith, PhD,[e] Jamie Winter, PhD,[e] Jessica Greenson, PhD,[e] Amy Donaldson, PhD,[g] and Jennifer Varley, MS[e]

[a]Autism Speaks; [b]Department of Psychiatry, University of North Carolina, Chapel Hill, North Carolina; [c]Department of Psychology, [e]University of Washington Autism Center, Center on Human Development and Disability, and [f]Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, Washington; [d]MIND Institute, Department of Psychiatry, University of California Davis, Sacramento, California; and [g]Department of Speech and Hearing Science, Portland State University, Portland, Oregon

KEY WORDS
autism, behavioral intervention, cognitive function, developmental outcomes, early intervention

WHAT'S KNOWN ON THIS SUBJECT: Previous studies on the efficacy of early behavioral intervention for improving outcomes for preschool-aged children with autism have yielded promising results. However, no randomized clinical trials of early developmental behavioral intervention designed for toddlers with autism have been conducted to date.

WHAT THIS STUDY ADDS: This study assessed the efficacy of the Early Start Denver Model, a comprehensive developmental behavioral intervention, for improving outcomes of toddlers with ASD. The intervention, which was initiated when children were less than 2½ years, resulted in significant improvements in IQ, language, adaptive behavior, and autism diagnosis.

Relationship between brain and behaviour

O_1 O_2 Biological Origin

C_1 C_2 Cognitive Features

S Behavioural (Symptoms)
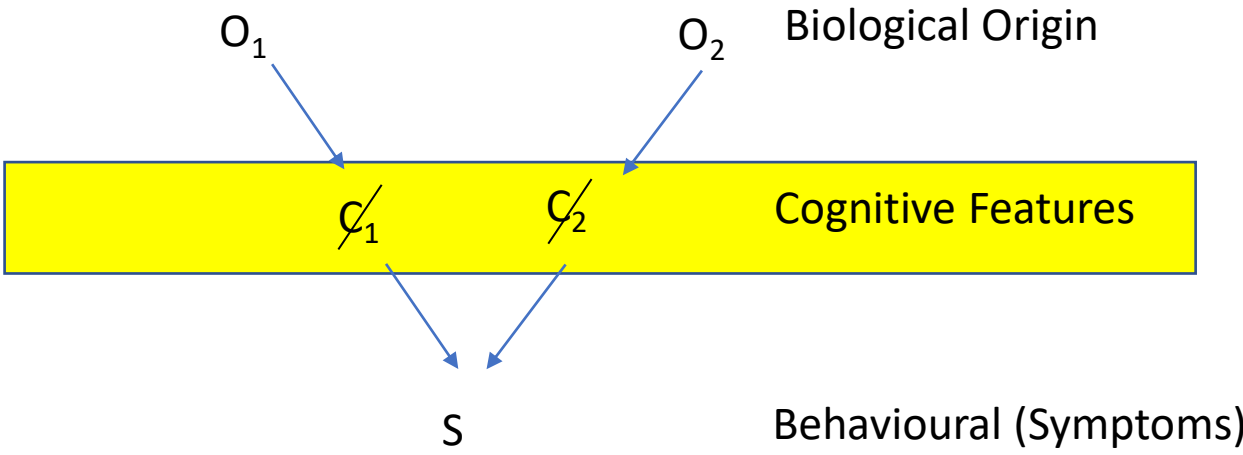
Morton & Frith (1995)

Main models

Social Motivation
Reduced preferential orientation to social stimuli
Reduced social learning experiences

Theory of Mind
Understanding people's mental states to predict behaviour
Self and others
Develops from or underlies Joint attention

Executive Functioning
Forward planning, organisation of thoughts and actions
Control impulses
Problem solving ongoing adjustment to feedback

Autism: a disorder of social interaction

- Lack of social initiation and reciprocity

- Sharing of interests, emotions or affect (**people as Sds, MOs and Srs**)

- Poorly integrated verbal and non verbal communication, poorly modulated eye contact and body language, use and understanding of gestures and facial expressions (**behaviour**)

- Difficulties in developing, maintaining and understanding relationships: adjusting to social contexts, pretend play and making friends (**outcomes**)

Compared to typically developing children with autism reliably demonstrate deficits in:

- Early onset difficulties with monitoring gaze, difficulty using the face to regulate and derive meaning in social interaction, and lack of eye contact (Chawarska et al., 2014a; Chawarska, Macari, Volkmar, Kim, and Shic, 2014b).

- Eye-tracking technology showing children with autism look at the eyes less than typical children (Chawarska, Macari, & Shic, 2013) and orient to non-social contingencies, instead of biological motion (Klin et al., 2009)

- Joint attention (Mundy, Sigman, Ungerer, & Sherman, 1986)

- Social referencing (Sigman et al. 1992; Warreyn et al. 2005).

Assessment: ADOS-2

- Semi-structured play based interactive assessment: 4 modules to be chosen depending on child's verbal ability

- ✤ **Toddler module:** 12 to 30 months

- ✤ **Communication:** frequency of spontaneous vocalisations, pointing and gestures

- ✤ **Reciprocal social interaction:** Unusual eye contact, facial expressions directed towards other, integration of gaze and other behaviours during observation, shared enjoyment in interaction, responding to name, responding to being ignored, requesting, showing, spontaneous initiation of joint attention, responding to joint attention, quality of social overtures

- Amount of social overtures toward caregivers, overall quality of rapport

At the structural level: (Supekar et al., , 2018)

- **Animal studies:** the mesolimbic reward pathway in driving and reinforcing social behaviour.

- **Human studies: 2 independent and controlled cohorts** (24 children ASD - 24 TDC children aged 7-13), replication cohort (17 children ASD - 17 TDC children) matched age, gender, IQ

- Disruption in neurobiological mechanisms underlies reduced social interest in humans.

- Investigation through imaging and fMRI showed that structural aberrations were accompanied by aberrant functional interactions between nucleus accumbens and ventraltegmental area (VTA) during a task of responding to social, non-social and neutral stimuli

- Structural and functional integrity of the mesolimbic reward pathway is aberrant in children with ASD, and these aberrancies contribute to the social interaction impairments.

- Both these structural and functional circuit aberrations in the mesolimbic reward pathway were related to parent-report measures of social interaction impairments in affected children (social subscale of ADI-R).

OPEN

Children with Autism show Atypical Preference for Non-social Stimuli

Catherine M. Gale[1], Svein Eikeseth[1] & Lars Klintwall[2]

The present investigation describes three studies testing the hypothesis that children with Autism Spectrum Disorder (ASD) show an atypical preference for non-social stimuli. Preference for non-social and social stimuli was assessed using applications on a portable tablet computer. Twenty-eight children with ASD were matched on developmental age with the chronological age of 41 typically developing (TD) children. The non-social stimuli consisted of six different films of abstract moving geometric patterns. Social stimuli were six different films of the face of young adults (Study 1 and 3) or six films of different dogs' faces (Study 2). When given a choice between the non-social and social stimuli, children with ASD preferred the non-social stimuli. When the human faces were replaced with dogs' faces the participants with ASD continued to prefer the non-social stimuli. A high reinforcement value of non-social stimuli was also demonstrated when the non-social stimuli were presented alone, suggesting the preference for the non-social stimuli was not simply an avoidance of social stimuli. Whenever an infant prefers non-social stimuli over social stimuli, non-typical development in social communication and social interests may result, together with the development of high levels and frequently occurring stereotyped and repetitive behavior. These behaviors define Autism.

Figure 1. (a) The tablet application as it was seen by the participants. Whenever one of the two blurred stimuli was touched, it increased in size and became clearly visible for 2 seconds. (b) One of the six non-social geometric stimuli as it was seen after it had been touched. (c) One of the six social human stimuli as it was seen after it had been touched. (d) One of the six social nonhuman stimuli as it was seen after it had been touched.
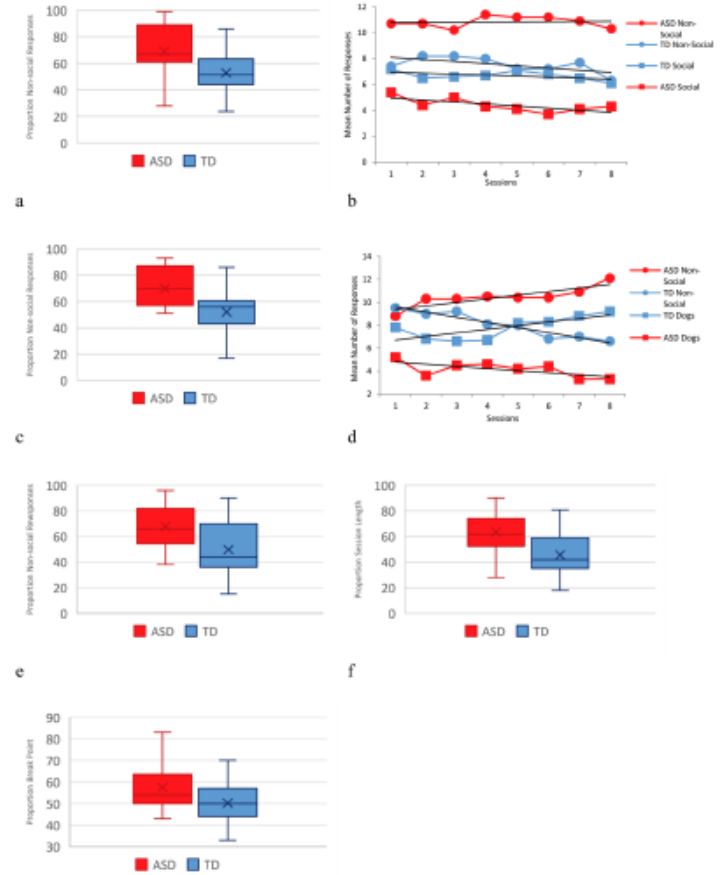

Figure 2. (a) Box and whisker plot showing proportion of responding to non-social stimuli (geometric images) when presented with social human stimuli (adults' faces) for ASD and TD children. (b) Mean number of responses per session for non-social (geometric images) and human social stimuli (adults' faces). (c) Box and whisker plot showing proportion of responding to non-social stimuli (geometric images) when presented with social nonhuman stimuli (dogs' faces) for ASD and TD children. (d) Mean number of responses per session for non-social (geometric images) and nonhuman social stimuli (dogs' faces). (e) Box and whisker plot showing proportion of responding to non-social stimuli when social and nonsocial stimuli were presented in a single choice arrangement using a progressive ratio reinforcement schedule. (f) Proportion of responding to non-social (geometric images) when reinforcement strength during the progressive ratio schedule was measured as session length. (g) Preference for non-social stimuli when reinforcement strength during the progressive ratio schedule was measured as the schedule breakpoint.

Social reinforcement is common in many mammals, but only in humans…

- A first approximation: "Behavior reinforced through the mediation of other persons" (1957, p. 2).

- However, "To say that we are interested only in behavior which has an effect upon the *behavior* of another individual does not go far enough" (p. 224) – waving a fly off your food would meet the "verbal" aspect of this definition.

- **"If we make the further provision that the 'listener' must be responding in ways which have been conditioned *precisely in order to reinforce the behavior of the speaker,* we narrow our subject to what is traditionally recognized as the verbal field**" (Skinner, 1957, p. 225; emphasis in the original).

- "The special conditioning of the listener is the crux of the problem. Verbal behavior is shaped and sustained by a verbal environment -by people who respond to behavior in certain ways because of the practices of the group of which they are members. These practices and the resulting interaction of speaker and listener yield the phenomena which are considered here under the rubric of verbal behavior. (Skinner, 1957, pp. 225-226; emphasis in the original)"

- "Once acquired, verbal behavior can be emitted under many conditions, even in the absence of a listener. Moreover, the speaker can be, and usually is, also a listener to his own verbal behavior" (Palmer, 2013).

Early intervention is critical

- Research linking specific neurobiological abnormalities to deficits in social behavior typical of ASD is promising, but still in its infancy.

- **Consensus: early social deficits reduce participation in social learning experiences, and should therefore represent a primary target for intervention**

Trends in Cognitive Sciences

CellPress REVIEWS

Review

Neonatal Transitions in Social Behavior and Their Implications for Autism

Sarah Shultz,[1,2,*] Ami Klin,[1,2,3] and Warren Jones[1,2,3,*]

Within the context of early infant–caregiver interaction, we review a series of pivotal transitions that occur within the first 6 months of typical infancy, with emphasis on behavior and brain mechanisms involved in preferential orientation towards, and interaction with, other people. Our goal in reviewing these transitions is to better understand how they may lay a necessary and/or sufficient groundwork for subsequent phases of development, and also to understand how the breakdown thereof, when development is atypical and those transitions become derailed, may instead yield disability. We review these developmental processes in light of recent studies documenting disruptions to early-emerging brain and behavior mechanisms in infants later diagnosed with autism spectrum disorder, shedding light on the brain–behavior pathogenesis of autism.

Highlights
From the first moments of life, neonates exhibit a range of socially adaptive preferences and reflex-like responses that serve to orient their attention towards caregivers, as well as behaviors that serve as important signals to those caregivers.

Within the first 6 months of typical infancy, a series of pivotal transitions occur within the context of early infant–caregiver interaction, as initially spontaneous reflex-like responses transition into remarkably sensitive and contingent social action.

Recent reports suggest that these developmental transitions may be disrupted in autism spectrum disorder, opening a critical theoretical insight into understanding the brain–behavior pathogenesis of autism.

Neonatal Development in Context
At birth, the behavioral repertoire of human newborns is limited [1,2]. Within just days, weeks, and months, however, early reflexes and reflex-like predispositions give way to complex volitional behavior: infants acquire new vocal abilities [3]; change their feeding, sleeping, and waking patterns [4–6]; and acquire new control of their eyes, neck, hands, and feet [7–12]. Brain size at birth, approximately one-third that of an adult's [13], doubles during the first year [14] and increases by another 35% by year 3 [15]. Synaptic density quadruples in year 1 and will be 150–200% greater than that of an adult by year 3 [16,17] (to then be pruned or selectively strengthened in iterations that continue throughout the lifespan [17,18]).

Social Motivation

- "At the proximal level: a set of psychological dispositions and biological mechanisms biasing the individual to preferentially orient to the social world (social orienting), to seek and take pleasure in social interactions (social reward), and to work to foster and maintain social bonds (social maintaining)" (Chevallier et al., 2012 p.2)

- "At the ultimate level, social motivation constitutes an evolutionary adaptation geared to enhance the individual's fitness in collaborative environments" (Chevallier et al., 2012 p.2)

Effects of lack of social motivation

- "Early-onset impairments in social attention set in motion developmental processes that ultimately deprive the child of adequate social learning experiences and that the resulting imbalance in attending to social and non-social stimuli further disrupts social skill and social cognition development [46–48]. As discussed in detail below, recent evidence demonstrates that social orienting, social seeking and liking, and social maintaining are all disrupted in ASD" (Chevallier, 2012, p.4).

Unusual language development as a consequence

- Deficits in the acquisition of verbal behaviour may, in fact, not result primarily from considerations relating to verbal behaviour itself, but from the paucity of opportunities for learning such behaviour that result from core deficits in interpersonal interaction and other repertoires of social behaviour (e.g., Mundy, Sigman, & Kasari, 1990).

Social reinforcement

- "It follows that the child who **has failed to acquire such reinforcers,** should demonstrate **a deficiency** in the behaviors which would have been reinforced. In the extreme case of complete failure to acquire secondary reinforcers, the child should evidence little, if any, **social behaviors**. That is, the child should fail to attend to people, fail to smile, fail to seek company, to talk, etc., because his environment has not provided him with the rewarding consequences for such behaviour to increase or because he is unable to appreciate that consequences are rewarding. It is apparent that such failure in the acquisition of secondary reinforcers need not be complete, but may be partial". (Lovaas et al., 1966, p. 118-119)

The question

- How can behaviour be established for which typically reinforcing stimuli do not function as reinforcers?

- In other words, how can social behaviour be established through interaction with other people, and to achieve interaction with other people, when such interactions are not naturally reinforcing?

- **Interaction is the means through which language is acquired and the reason why it is acquired**

An irrelevant debate

- Is social attention a primary or conditioned reinforcer?

- What do we mean by attention?

- A movement from another person: interaction in typical humans appears to be inherently reinforcing

- Regardless, social stimuli have reinforcing properties for most humans and guide the typical child's intellectual, verbal and social development. Their reinforcing properties likely develop in utero, at birth for example infants show preferential orienting to familiar voices.

- **Orienting to social visual stimuli as the first stepping stone into the platform of (social) learning**

Preference for social stimuli from birth

Early vocal behaviour: the role of the social context

Vocal apparatus movement brought under operant control

The infant as a listener

- Before first year of age

- Simple and conditional discriminations

- Turns to name, follows instructions (body parts and actions), selects objects (gives and points to on instruction)

Joint Attention: Topographies that recruit and maintain social interaction that involve social stimuli at most levels of the contingency
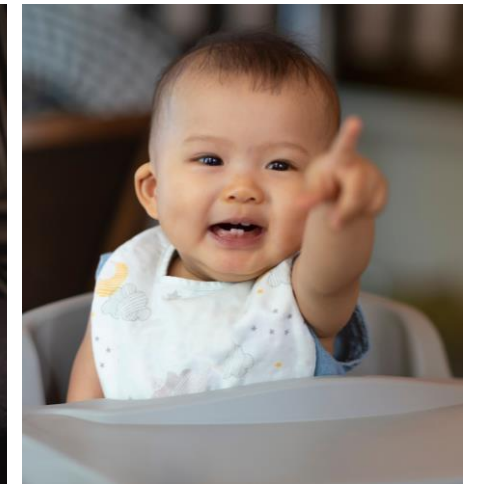
Social life

- Social stimuli differs in origin, not in function, from inanimate stimuli, they are the products of others' behavior.

- "**Social life arises because social stimuli come to exercise these functions**." (Keller & Schoenfeld, 1950 p. 352-353)

- "Social behavior may be described as behavior for which the **reinforcing or discriminative stimuli** are, or have been, mediated by the behavior of another organism." Keller & Schoenfeld, 1950, pp. 257-258.

Social MO, Sd and Sr

- Social Motivation
- Social Attention behaviours
- Social Reinforcement
- In autism, we have to be careful in distinguishing what may look like social reinforcement, but may be mediated by automatic stimulation (i.e., tickles, spinning)
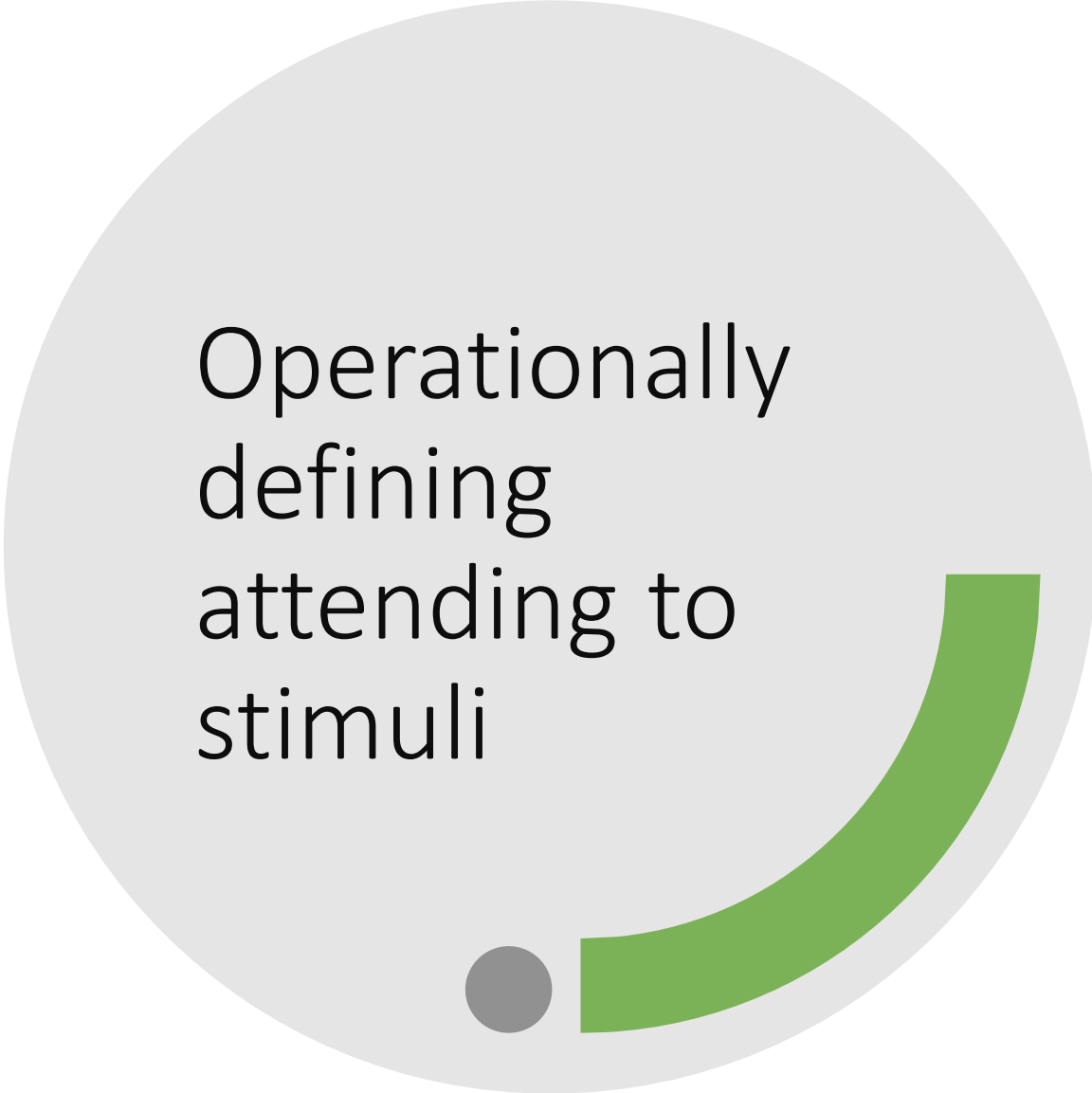
All parts of the contingency

- Can potentially be implicated in all aspects or parts of a contingency - at the antecedent level (MO and SD), as a response (conventional topographies that recruit social interactions) and at the consequence level – the actions of the person are the reinforcer.

- This way we can look at social behaviour as being on a continuum, from non-social to minimally social to fulfilling the social contingency in all of its dimensions

Social interaction

- CMO: an event

- SD: person (or toys **and person**)

- R: vocal or non vocal

- SR: vocal or non vocal action of the person

- Any response that is evoked by the presence or action (can be verbal or nonverbal) of a person and maintained by continued contact with the person (interaction). In the case of "social play", the person increases the value of the objects and their use, or it is necessary for the reinforcing movement (sensory motor social routines).

- "As organisms living in a complex environment, we are affected by multiple stimuli from moment to moment. As a result (of our evolutionary history), we have developed a singularly efficient method of selecting and **attending to stimuli** so that we can affect some kind of control over the environment in which we live" (Keohane, Luke, & Greer, 2008, p. 23).

Operationally defining attending to stimuli

Why social attentive behaviours before mands

- What is the Sd?

- How does the child "know" if an opportunity for honouring his mand exists?

- What are the signals that the child must learn to discriminate?

- What is "attention"? What are the behaviours that we commonly tact as "attention"?

- Looking - how does the child know if the adult is attending/looking?
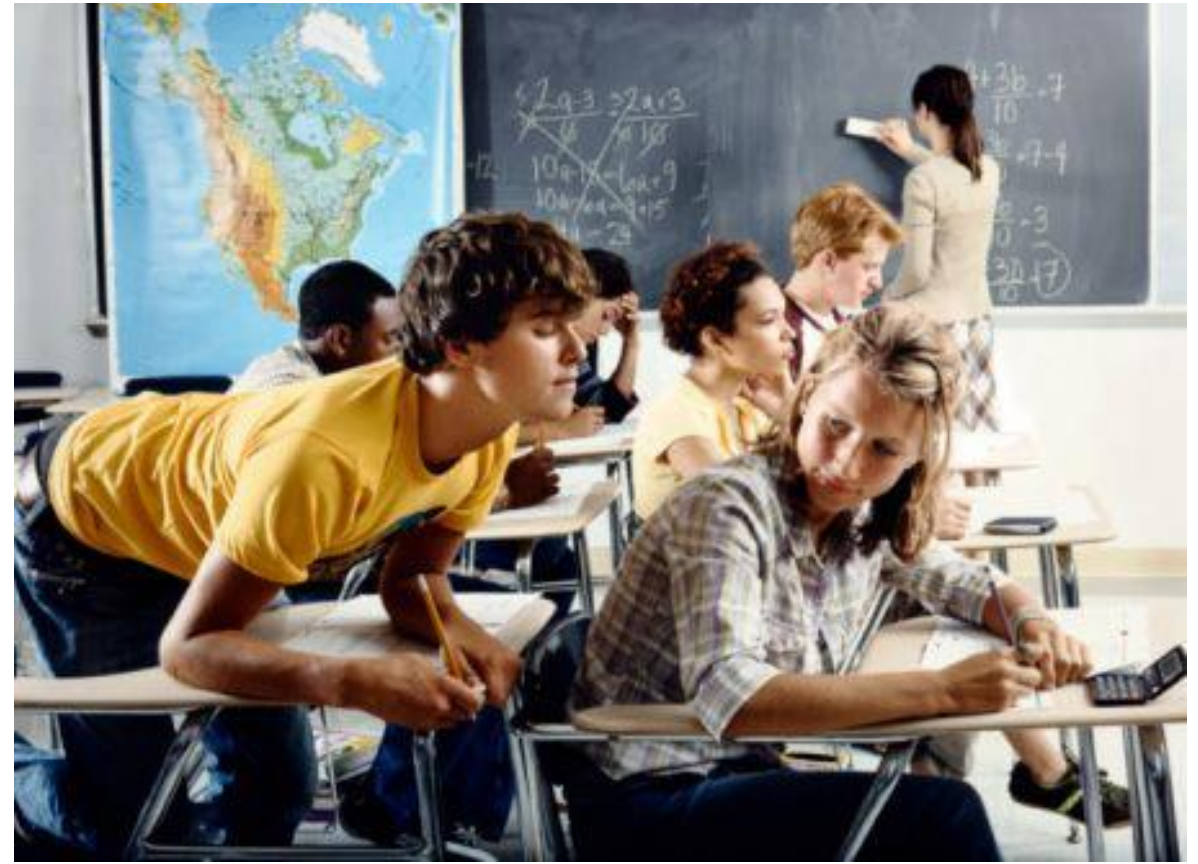
When do you press on the accelerator?
When would you ask a question?
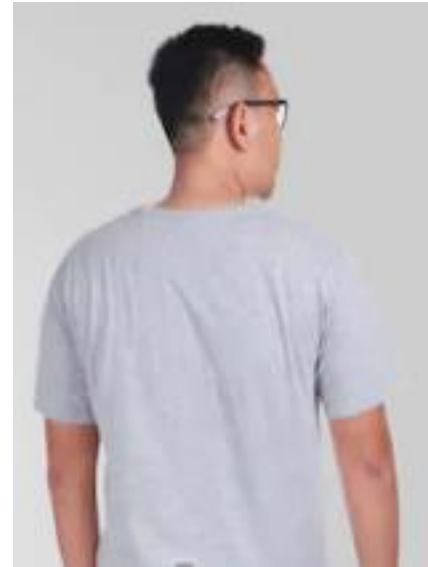
How do you know when to engage in the relevant behaviour (pressing or manding?)

We start with the eyes and open the window into the social world

Monitoring others gaze

Looking as the earliest operant response to contact social stimuli

- Responses that create contact with the antecedent stimulus. The antecedent stimulus that evokes subsequent behaviour or reinforcement is a reinforcer that maintains the observing behaviour (Dinsmoor, 1983)

S^D S^Δ *MULT*

R   **R**

VR   *MIX*   **Ext**
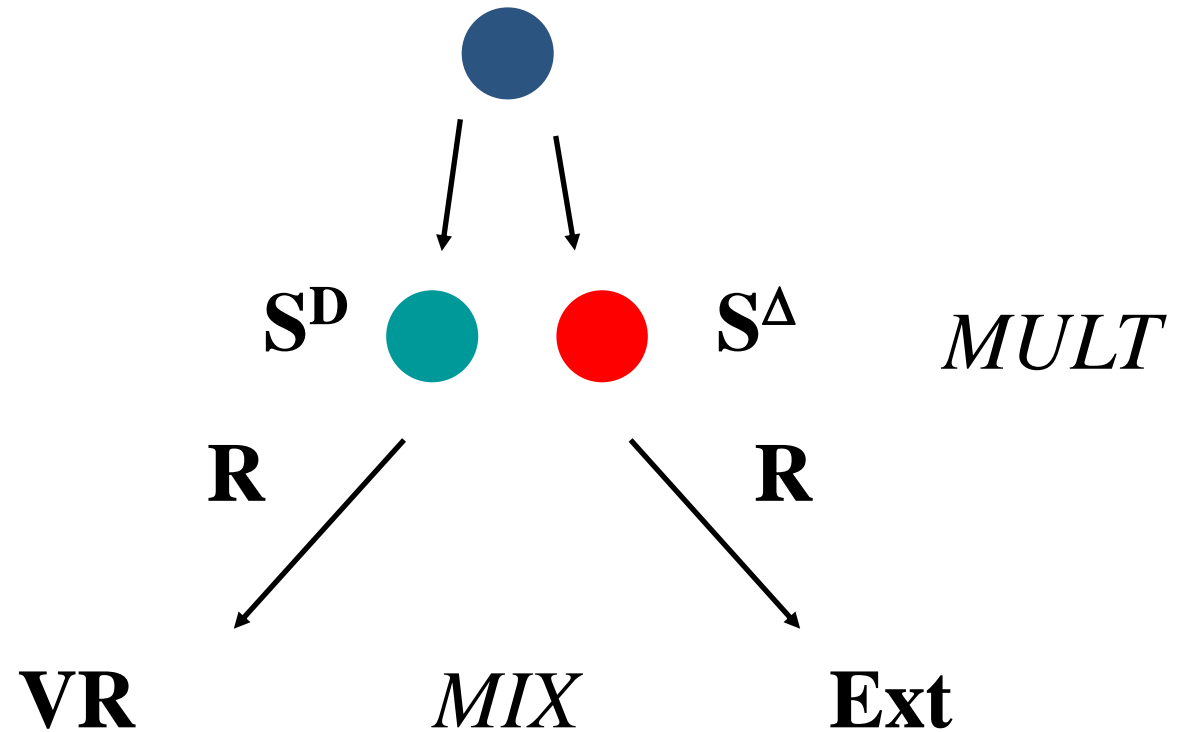
Per Holth 2009

Some procedural models

- "Social behavior may be described as behavior for which the **reinforcing or discriminative stimuli** are, or have been, mediated by the behavior of another organism." Keller & Schoenfeld, 1950, pp. 257-258.

- Eye-contact as behaviour, demonstrations of attending by adult as the reinforcer
  - Dube et al., 2004 (shared interest)
  - Carbone et al., 2007 (to honour mand)
  - Isaksen & Holth., 2009 (signal for access)

Potential techniques

- Stimulus - stimulus pairing: Dozier (2012) - inconsistent results
- Response contingent pairing: Dozier (2012), Axe & Laprime (2017)
- Discrimination training: Isaksen and Holth (2009), Carbone et al., (2013)
- Observational Learning: Leaf et al (2012, 2016)

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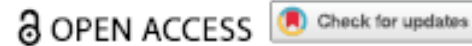
A systematic review of behaviour analytic processes and procedures for conditioning reinforcers among individuals with autism, developmental or intellectual disability

Elena Cló and Katerina Dounavi

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ABSTRACT

Autism Spectrum Disorder is diagnosed when individuals demonstrate repetitive behaviours and restricted interests, especially in relation to social stimuli, that make it difficult for them to access socially reinforcing environments. Consequently, in most cases, behaviour analytic interventions initially have to focus on the establishment/conditioning of effective reinforcers. A systematic review was conducted of the literature on conditioned reinforcement that identified 33 relevant articles (published between 2002 and 2017). This article reports on the content analysis and quality of evidence and offers a summary of the findings reported in these papers. Four lines of research were identified: classical conditioning, operant conditioning, observational learning, and comparison studies. Differences and similarities are reported concerning procedures, type of stimuli to be conditioned, responses measured, reported effectiveness, and quality of evidence. Recommendations for future research and clinical practice are provided.

Figure 1. Contingency diagram. Large box indicates a context that includes a familiar adult. Smaller boxes show stimuli and responses. Abbreviations for contingency terms appear above or below boxes: SD = discriminative stimulus; R = response; Sr+ = conditioned reinforcer; MO = motivating operation. Dashed arrows show a three-term contingency that is independent of adult-mediated consequences. Solid arrows show contingencies that may support joint attention initiation. The curved gray arrow from MO to Sr+ represents the reinforcer-establishing effect of the interesting event; the arrow from MO to R represents the evocative effect of the interesting event.

Dube et al., 2004
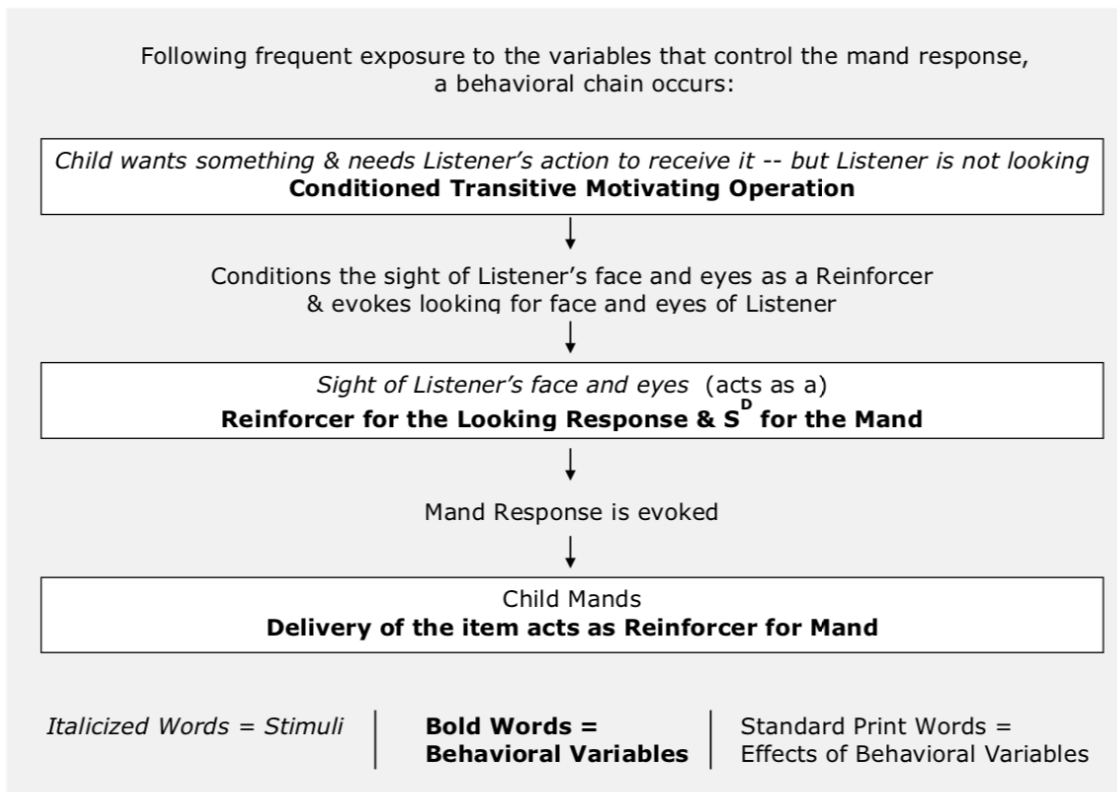
Figure 2. Description of the behavioral variables that evoke the eye contact response and select and maintain it by reinforcement in the form of social attention of a communication partner.

Carbone et al., 2013: "Teaching Eye Contact to Children with Autism: A Conceptual Analysis and Single Case Study"

Isaksen & Holth, 2009 "An operant approach to teaching joint attention skills to children with autism"

- Gaze following

- Monitoring

- Social referencing

- Protoimperative

- Protodeclarative
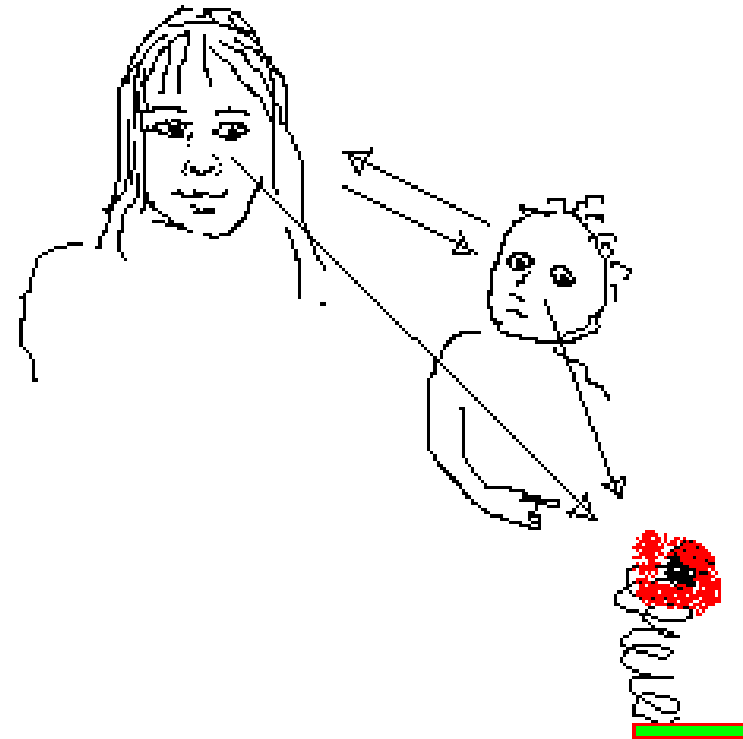
Distinct behaviours

- Applied research has focused mainly on the organisation of discrete contingencies, distinct events to establish specific topographies (e.g. eye-contact) in response to specific social stimuli (e.g. smiles, nods), either as conditioned reinforcers or discriminative stimuli. Or to test the effectiveness of previously neutral social stimuli on the emergence of new responses.

- **Such molecular analyses and derived applications help in identifying the underlying processes and potential sources of stimulus control, but at the clinical level they may lead us to procedures that reduce a complex response class (social behaviour) into instances of single topographies**

- Lack of a comprehensive behaviour analytic applied approach that exclusively focuses on establishing social behaviour at all levels of the contingency rather than as distinct and discrete responses

Molecular versus molar

- Social behaviour includes a multitude of topographies and it is fluid, dynamic, involving **constant adaptations to changes in the social arena**. It typically involves **integrated** responses that are intertwined: showing **while** smiling **while** shifting gaze from person to item and back **while** vocalising.

- This is different from a chain of responses: showing, **then** looking, **then** vocalising.

- Social responses often occur **bundled** together, not **chained** after one another

- How can we incorporate the current molecular analyses and treatment models into a naturalistic intervention framework that is conceptually systematic and firmly based on a Skinnerian analysis of social and verbal behaviour?

Behavioral chain, but social

ORIGINAL ARTICLE

Social Referencing and Children with Autism

aime A. DeQuinzio[1] · Claire L. Poulson[2] ·
awn B. Townsend[3] · Bridget A. Taylor[1]

Abstract During social referencing, infants as young as 6 months of age look to oth
when confronted with unfamiliar or unexpected events in the environment and th
espond to these events based on affective cues of the parent or caregiver (e.g., smil
nd frowning). Social referencing is important for early communication and langua
evelopment. Unfortunately, social referencing repertoires are limited or complet
cking in children with autism. Despite these documented social deficits, little resear
as focused on ameliorating social referencing deficits. The purpose of this paper is
resent a behavior-analytic conceptualization of social referencing and the implicatio
or ameliorating social referencing deficits of children with autism.

ANALYST

S^D/MO	Unfamiliar adult approaches
Link 1 Response	Child looks at mom
S^D Conditioned S^R	Mom nods and smiles
Link 2 Response	Child interacts with unfamiliar adult
Terminal S^R	Positive social interaction with mom and unfamiliar adult
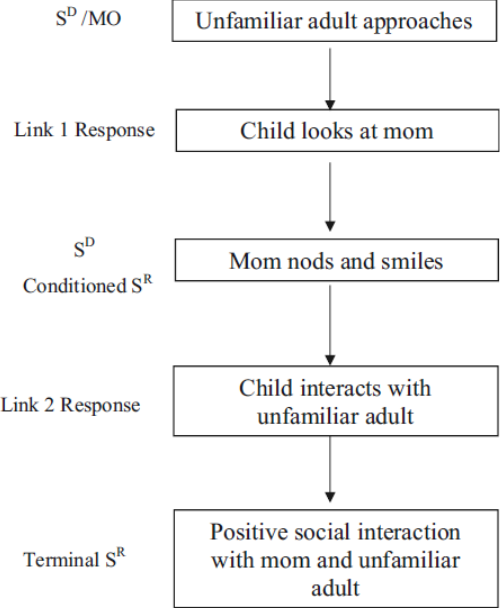
Diagram of the social referencing behavior chain in which the observing response produces affective
hat evoke an approach response with social interaction as the terminal reinforcer

A four term contingency
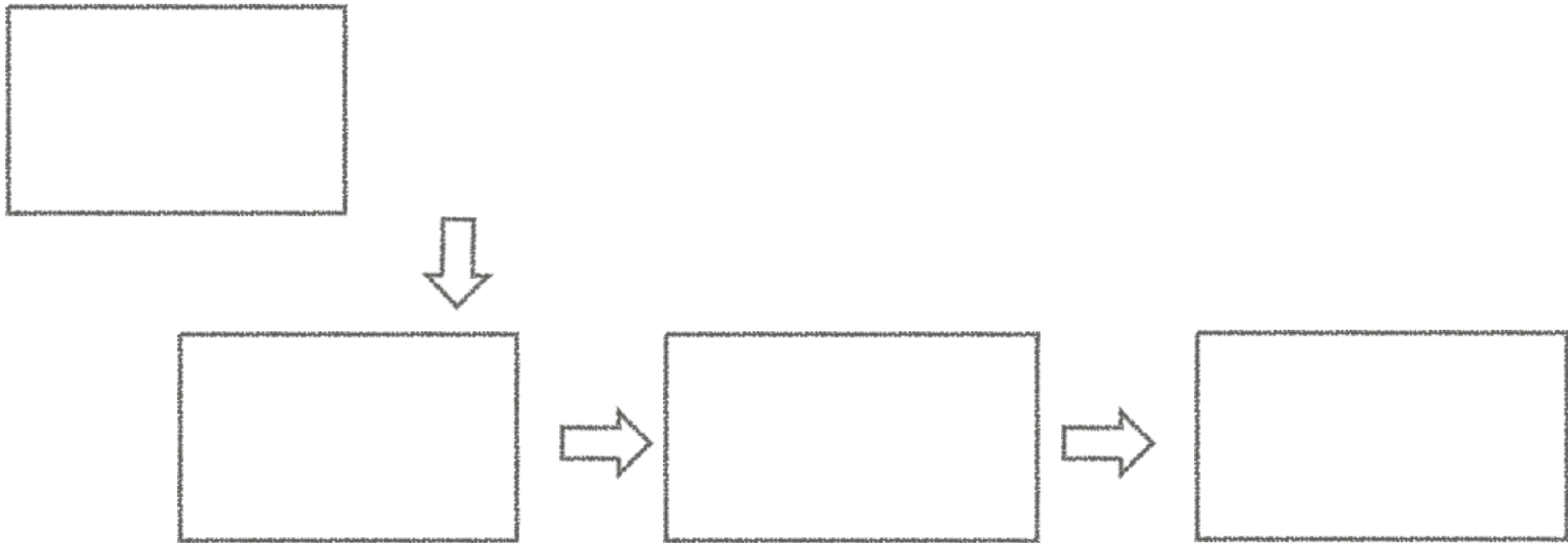
Define all parts of the contingency: Behaviour

- Start with behaviour:

- List behaviours that you would conventionally define as social: actions that specifically recruit contact with the actions of a person, not an object!
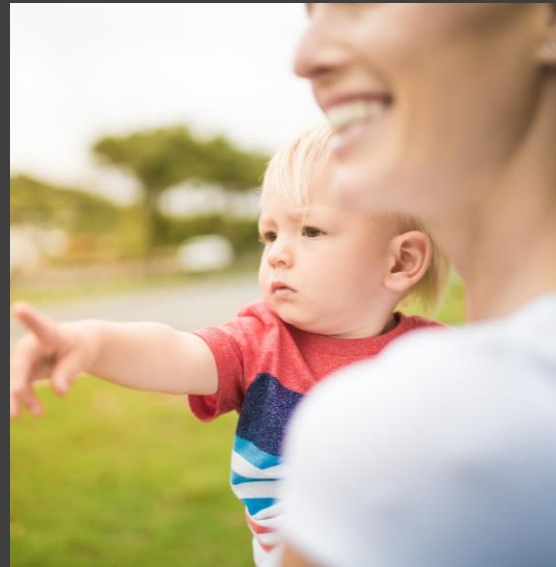
Prior to vocal mands

- Non-Specific, generalised mands for interaction/continuation of activity (anticipatory gestures specific to the activity, looking, showing, giving, proto-declarative pointing)

Building the social contingency

Looking, specific anticipatory gesture, showing, giving, pointing
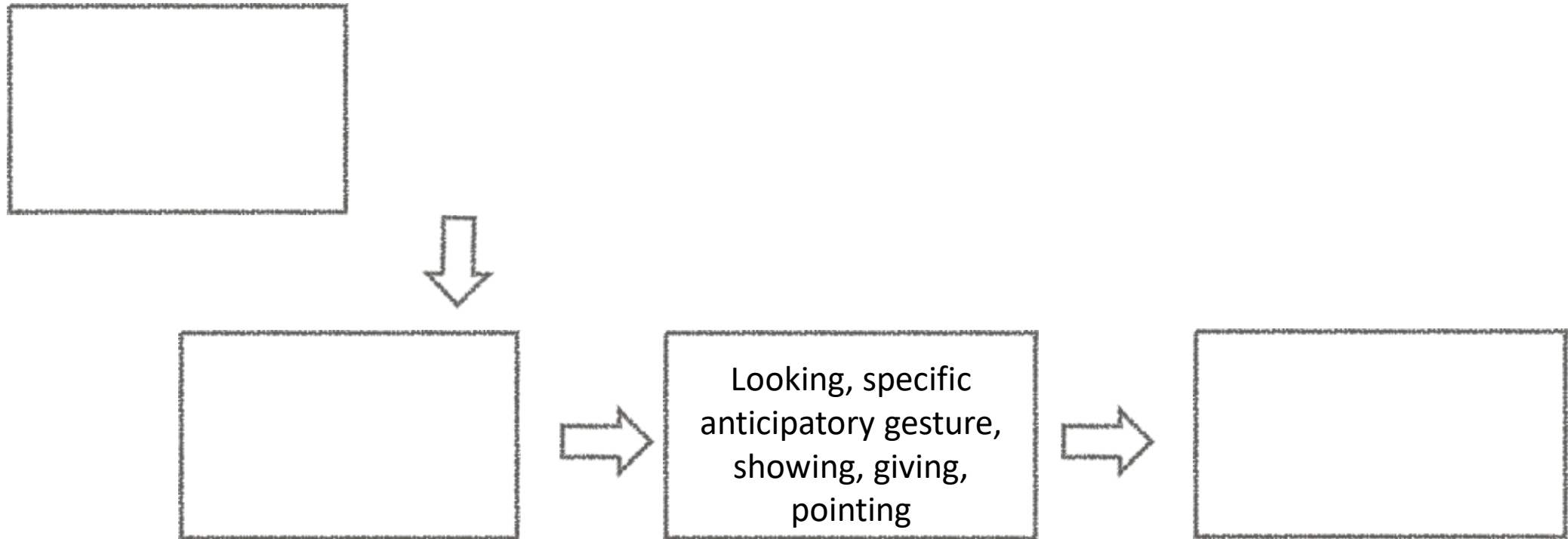
The reinforcer must be social: your actions

- To initiate the person's action
- To maintain contact with the person's next action
- To alter the person's action

Building the social contingency

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│              │     │ Turning and looking, │     │ Person's movement    │
│              │     │ specific anticipatory│     │ (verbal, smiles, nods,│
│              │     │ gesture, showing,    │     │ specific action)     │
│              │     │ giving, pointing     │     │                      │
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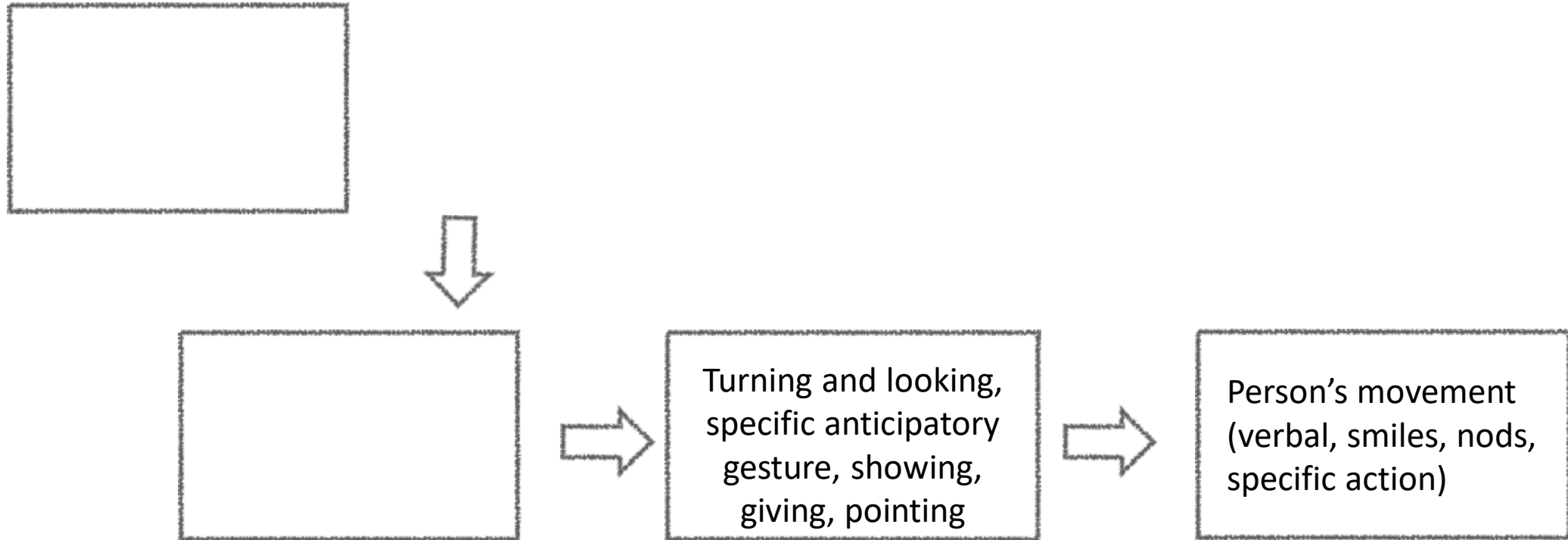
Define the antecedents

- The Sd is easy

- The MO: a change in the (external in our case) that alters the value of the person's actions as a reinforcer and increases the probability of the (social) behaviours that have previously contacted that interaction, in the presence of the person as the main discriminative stimulus

Building the social contingency

Person facing the child → Turning and looking, specific anticipatory gesture, showing, giving, pointing → Person's movement (verbal, smiles, nods, specific action)
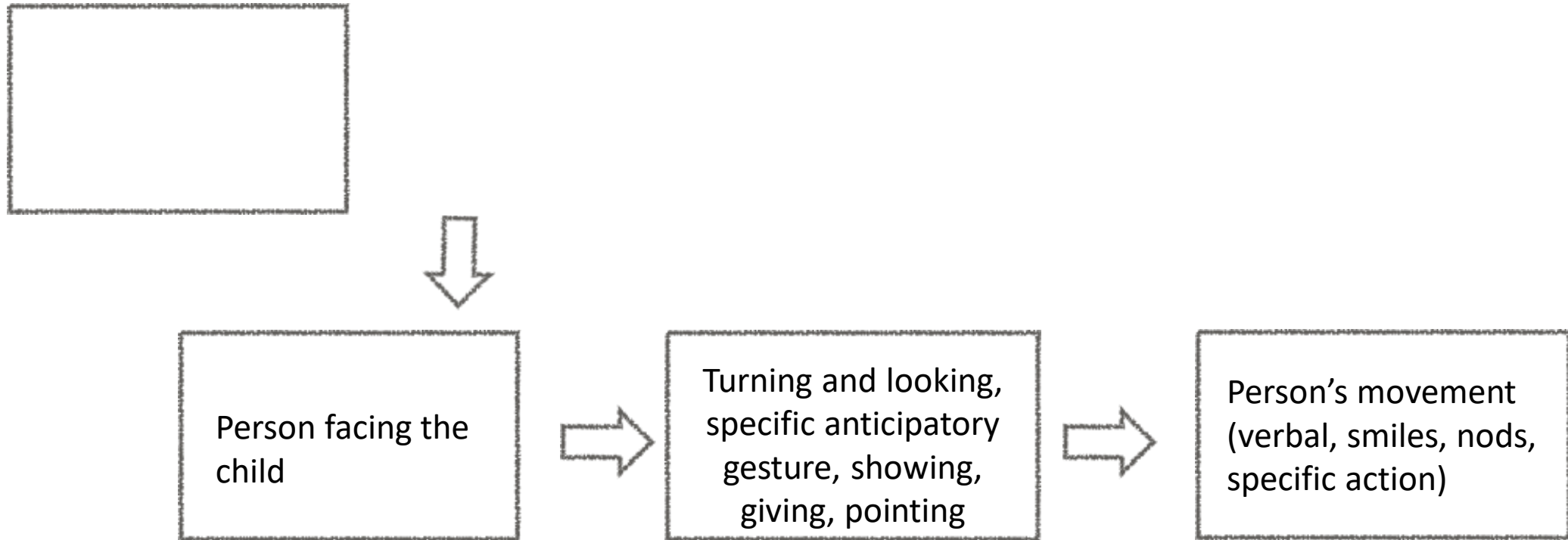
Building the social contingency-movement

Absence/too much of *THAT* action

Person facing the child ⇒ Turning and looking, specific anticipatory gesture, showing, giving, pointing ⇒ Person's action (verbal, smiles, nods, specific action)
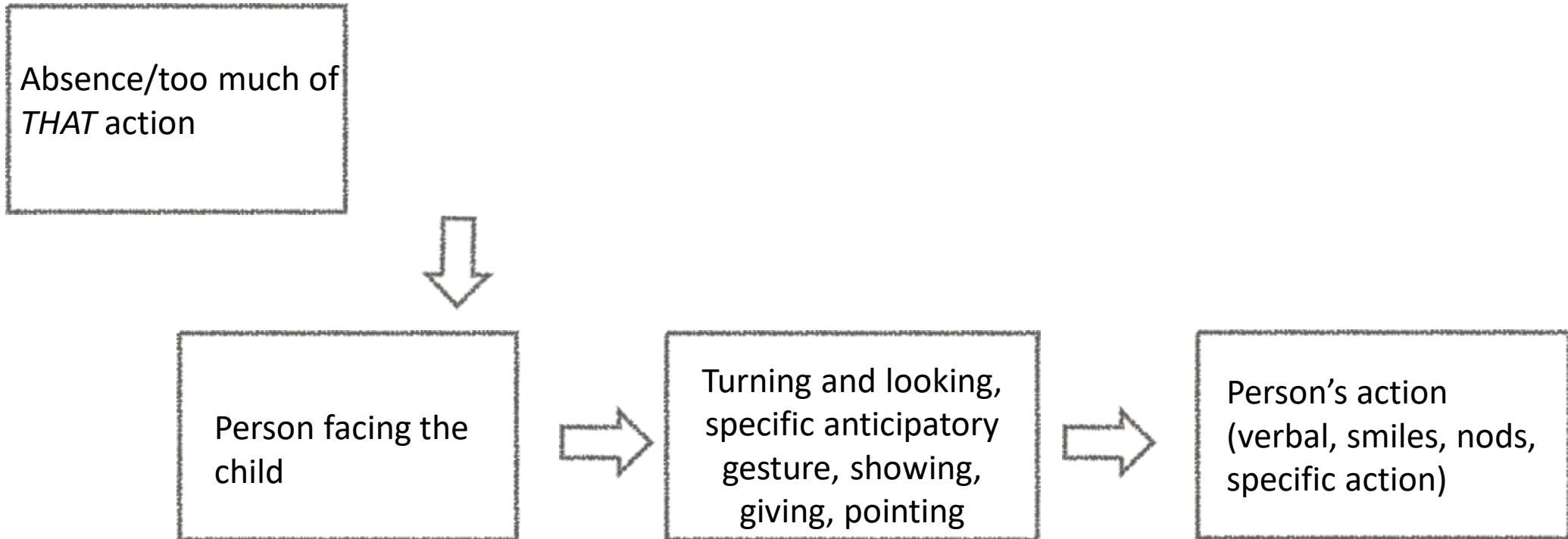
Building the social contingency- toy play

Toy available, but no adult action

Person available → Turning and looking, specific anticipatory gesture, giving, pointing → Toy and adult action (social play)

Non-social toy play

Toy available

Person Absent → Solitary play → Automatic reinforcement
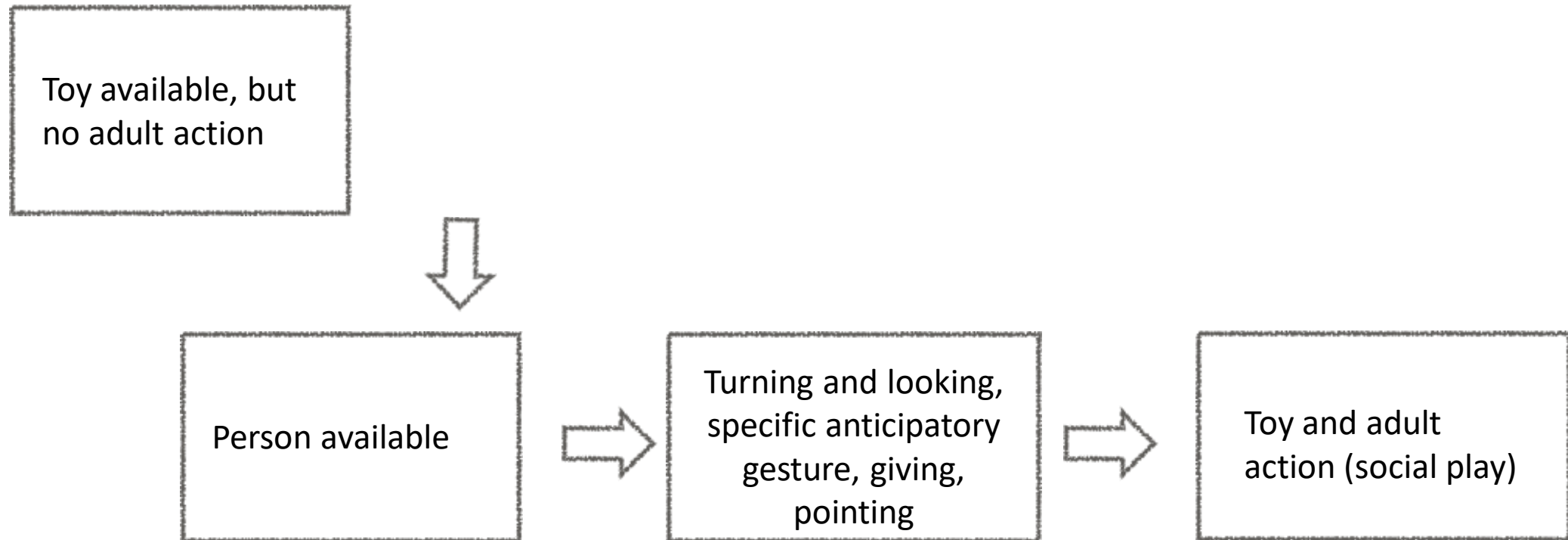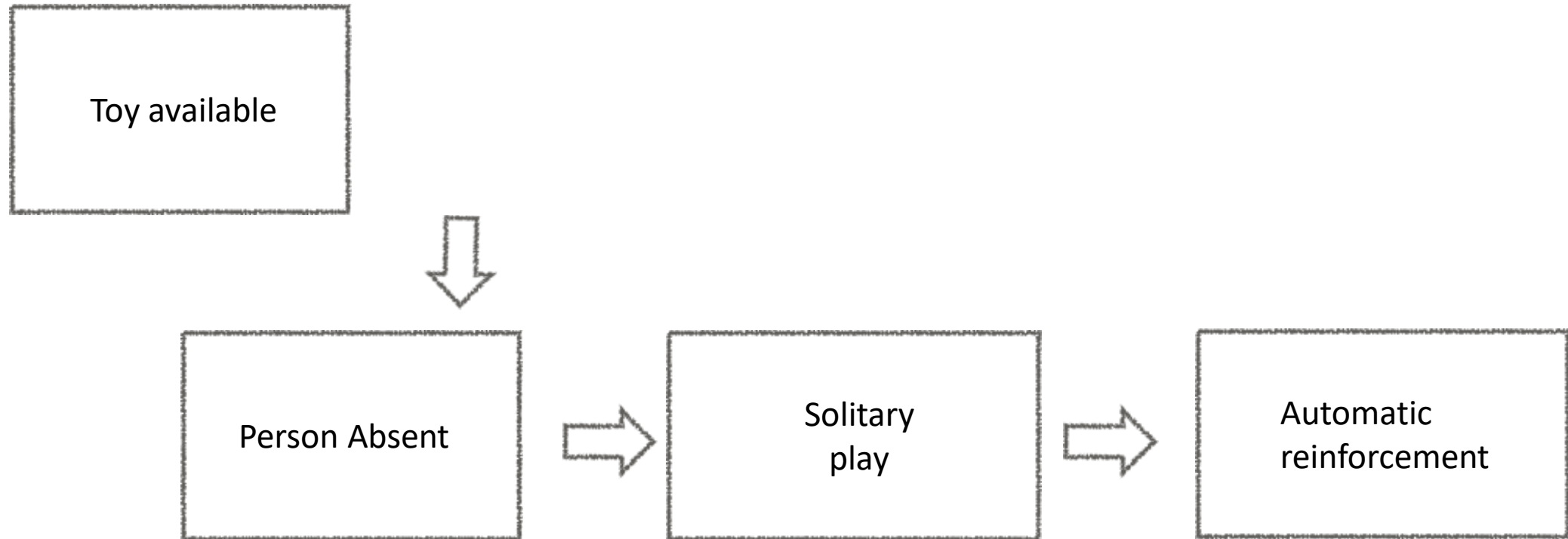
Absence of toy

↓

Toy held by adult (blocked access) ⇒ Mands "Toy" ⇒ Receives toy – automatic reinforcement

Does the child help himself?

Absence of toy

Toy on the floor ⟹ Takes toy ⟹ Receives toy – automatic reinforcement

Adult is present
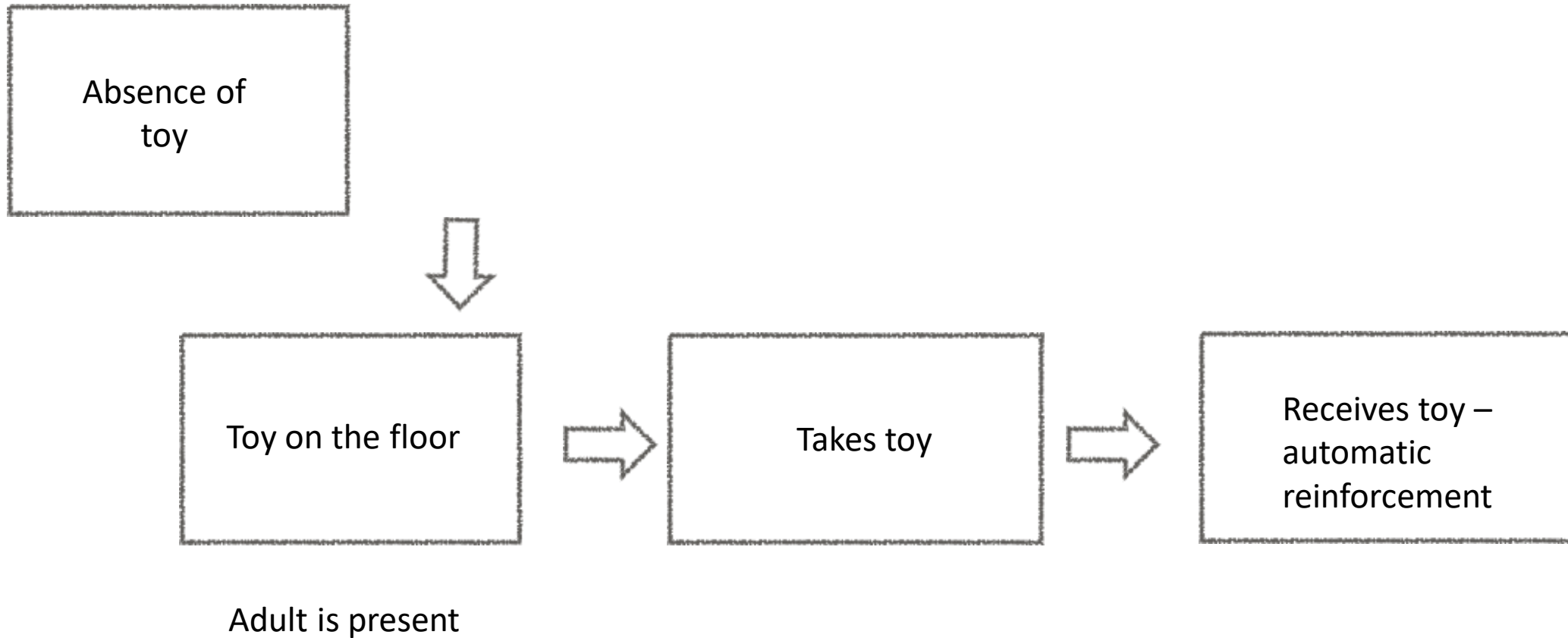
What do we do to evoke the behaviours to be reinforced

- **Adapting one's behaviour** based on fluctuations in the child's behaviour (interest) in order to maintain the child in contact with our actions and adult mediated activities.

- **Creating opportunities:** making changes to the physical or verbal environment to alter the value of certain stimuli (MO manipulation) and establish the adult and his or her cues (expression, eye-contact, gestures) as a discriminative stimulus for the delivery of the reinforcer.

- We want to be part of that reinforcer, not just givers (vending machines).

What to reinforce?

- Natural contingencies of reinforcement: the various activity components

- To evoke behaviours that naturally recruit social interaction through social interaction (all VB is social)

- If we can achieve this early in intervention, we can then create opportunities to teach language in the context of specific play activities, without relying on arbitrary non functional reinforcers

- The actions of the adult (a change in a verbal antecedent or a change in the physical environment) as Sds and Srs

Examples od objective, from Early Behavioural Intervention Checklist (EBIC) –
degli Espinosa (2011)

Proximity, cooperation

And stereotypy can be easily redirected!

G	**Takes tangible Sr+ from adult**	Takes the reinforcer from the adult's hand when it is offered
G	**Approaches the adult**	Approaches adults when they have the reinforcer
G	**Proximity to the adult**	Remains in close proximity of the adult when reinforcers or favourite activities are delivered
G	**Approaches on adult request (come here)**	Responds to the request "Come here" when adult has the reinforcer or is in proximity of the favourite activity
G	**Hands the Sr+ back**	Gives back reinforcers or items within a favourite activity when asked "Give me" (or adult open hand held out)
G	**Proximity to the adult when instructions are issued**	Stays in close proximity to the adult during a reinforcing activity and instructions related to the activity are also being given

1

Examples od objective, from Early Behavioural Intervention Checklist (EBIC) – degli Espinosa (2011)

Early social objectives

G	**Gaze orientation**	Follows a moving object with her/his gaze
2 G	**Conditioning of eye contact with reinforcer**	Looks at the adult before the delivery of the reinforcer (does not take or grab)
G	**Conditioning of eye contact during an activity/ anticipation**	Looks at the adult in anticipation of a desired action during social or physical games (e.g. peek-a-boo, tickles, singing songs together)
G	**Responds to name**	Turns around and looks at the adult when his/her name is called during a mildly distracting activity or in a distraction free environment
G	**Interrupts action/ activity to respond to name**	Turns around and looks at the adult when his/her name is called during a favourite activity or whilst moving

A curricular framework for understanding and teaching verbal and social behaviour: From theory to practice

ABA CLINIC
Francesca degli Espinosa

The course aims to provide practictioners with the tools to derive procedures from a conceptual analysis of verbal behaviour, childhood development and the universal and syndrome-specific learning challenges of children with ASD. he course modules will accompany participants on a journey of the controlling variables that govern the development of a range of important repertoires that are typically compromised in ASD, from joint attention to theory of mind, naming and multiply controlled generative verbal behaviour. Participants will receive, as part of the course, the Early Behavioural Intervention Curriculum Checklists (EBIC), a framework for organizing the fundamental social and verbal skills of existing published curricula under their common sources of control. he EBIC is not a curriculum, but rather, a framework of cumulative and generalized skills, sequentially arranged and derived from Skinner's analysis of multiple causation, the establishment of which can be attained through delivery of a range of procedures to promote the emergence of social and generative verbal behavior. he EBIC is therefore a curricular framework for understanding skills regardless of a particular manual or theoretical orientation.

his framework will be used to guide participants in the design and arrangement of objectives in a developmental coherent sequence to obtain the greatest gains in novel, untaught, skills from the minimum amount of direct teaching across both naturalistic and structured environments and across varying complexities of stimulus control.

Each module, consisting of 4 interactive remote workshops (except for module 1), can be taken in isolation. Module 1 and the beginner checklist will be available in the early autumn.

Because of the practical nature of the course, each module is limited to 25 places to provide an individualised experience and discussion, no recording will be available. he course will include theory, discussion, video illustrations of the curricular appli-cations, and the EBIC checklist for the corresponding module.

Module 1: Early Skills: A functional analysis of curriculum development and early skills: early social responding, conditioning eye-contact, social behavioural chains and social play, listener and speaker within the same skin, naming.

Module 2: Intermediate Skills: multiply controlled generative verbal behaviour, convergent and divergent control, tact and intraverbal conditional discriminations, jointly controlled listener responding, descriptions and social commenting

Module 3: Advanced Skills: Being verbally and socially present, complex topic discrimination, inferences, deduction and problem solving, theory of mind and perspective taking, initiating and maintaining conversation

About the instructor: I am a BCBA-D and a psychologist and have worked in the field since 1996. I am mainly a clinician, working with families of chidlren with autism. In addition, I teach advanced verbal behaviour in a number of master courses around the world and provide supervision to BCBAs who wish to expand their theoretical and applied knowlege

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Preparation: select activities

- Observe the child: what is the source of reinforcement for him?
- Identify activities that have at least three steps (you need a chain)
  - Sensory-social
  - Sensory manipulation and cause and effect
  - Functional close-ended activities
  - Early board games
  - Arts and crafts
  - Symbolic and dramatic play (scenarios)

Pick carefully

- Do not use food or technology

- And AVOID highly competitive reinforcing activity (stereotypy)

- Some activities lend themselves to specific objectives (e.g., farm animals– imitation, picture book – listener behaviour and joint attention)

Tranfer of value

Latency (pausing)

Shaping
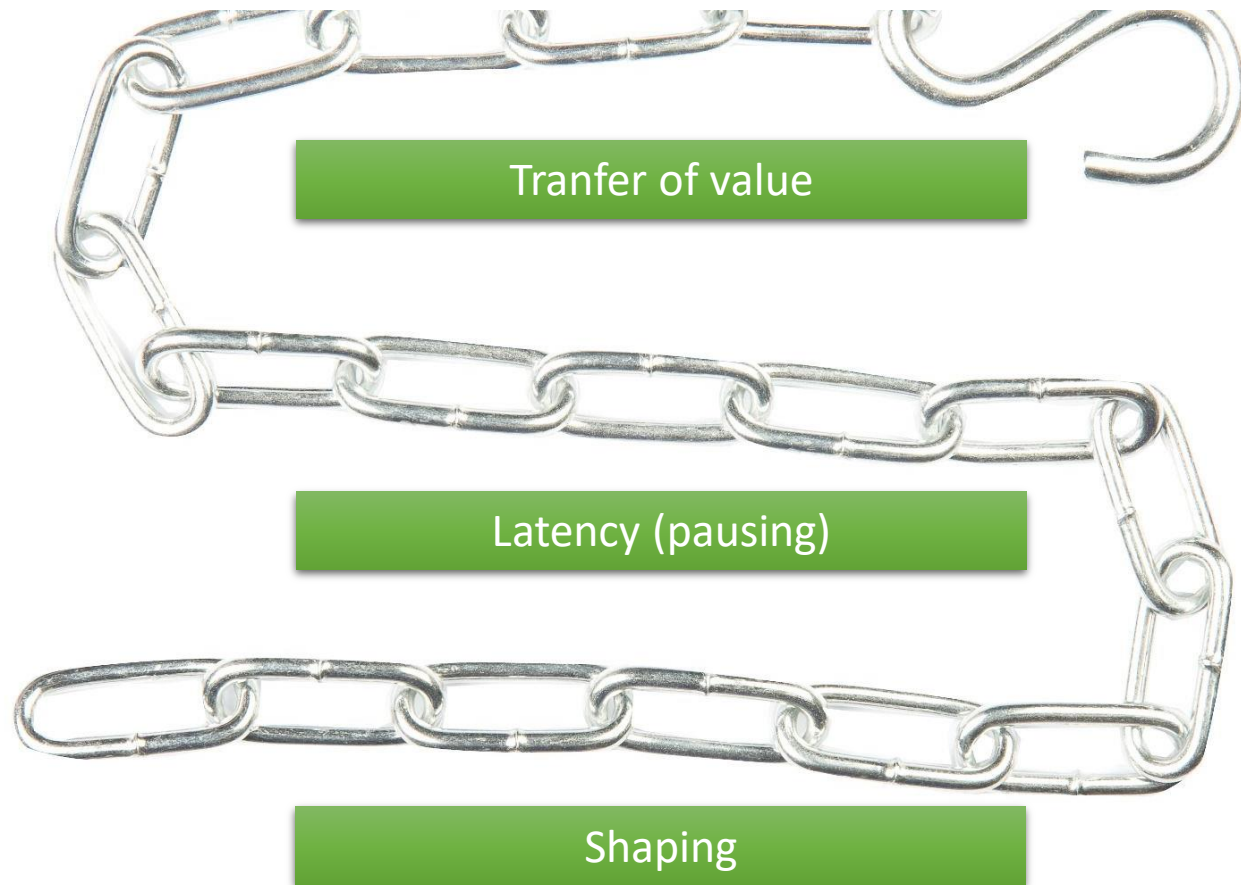
Step 1: BUILD THE CHAIN

- Do not be tempted to begin prompting behaviour immediately

- You must build a fluent chain first or there will be no anticipatory response from the child because he has not had enough experience, that is, contact with the steps

- Your objective is to build a chain in which all links are mediated by your actions to evoke behaviour that produces contact with the next adult mediated action as the reinforcer.

- The basic processes are: Transitive Mos and extinction induced variability

Basic guidelines

- No competitive reinforcers (control your environment)
- Avoid excessive verbalisation (one word up, comment do not instruct)
- Observe the child continually
- To shape you have to be quick, picking up on an any movement
- Proximity
- Head turning toward you
- Facial demonstrations of enjoyment

Step 2: pause before the next link

- This is when we press for behaviour, use a least to most approach

- The change from one link to another represents your choice point, the learning opportunity where you are going to press for the target social behaviour (look, trying to take, offering toy for help or to continue, show, activity specific gesture)

- Offer at least one learning opportunity every 15/30 seconds

- **You must pause to enable the behaviour to occur and shape over subsequent presses through your antecedent and consequence arrangements. For example, a head turn can turn into looking at you if you pause longer. A grab can turn into a reach, then a point if you hold item high. Moving item before giving can shape looking up toward you.**

Get ball

Throws in basket

Basket held high

Basket tipped

Ball held high

Reaches and looks

Two balls: points to choose one

Empty hand: adult points to where ball is, follows point to get ball

Turns to get ball from adult

Imitating different throws

Looking at adult in anticipation

Gesturing "down"

Giving basket to adult to tip

Balls falling down

Variations, closing
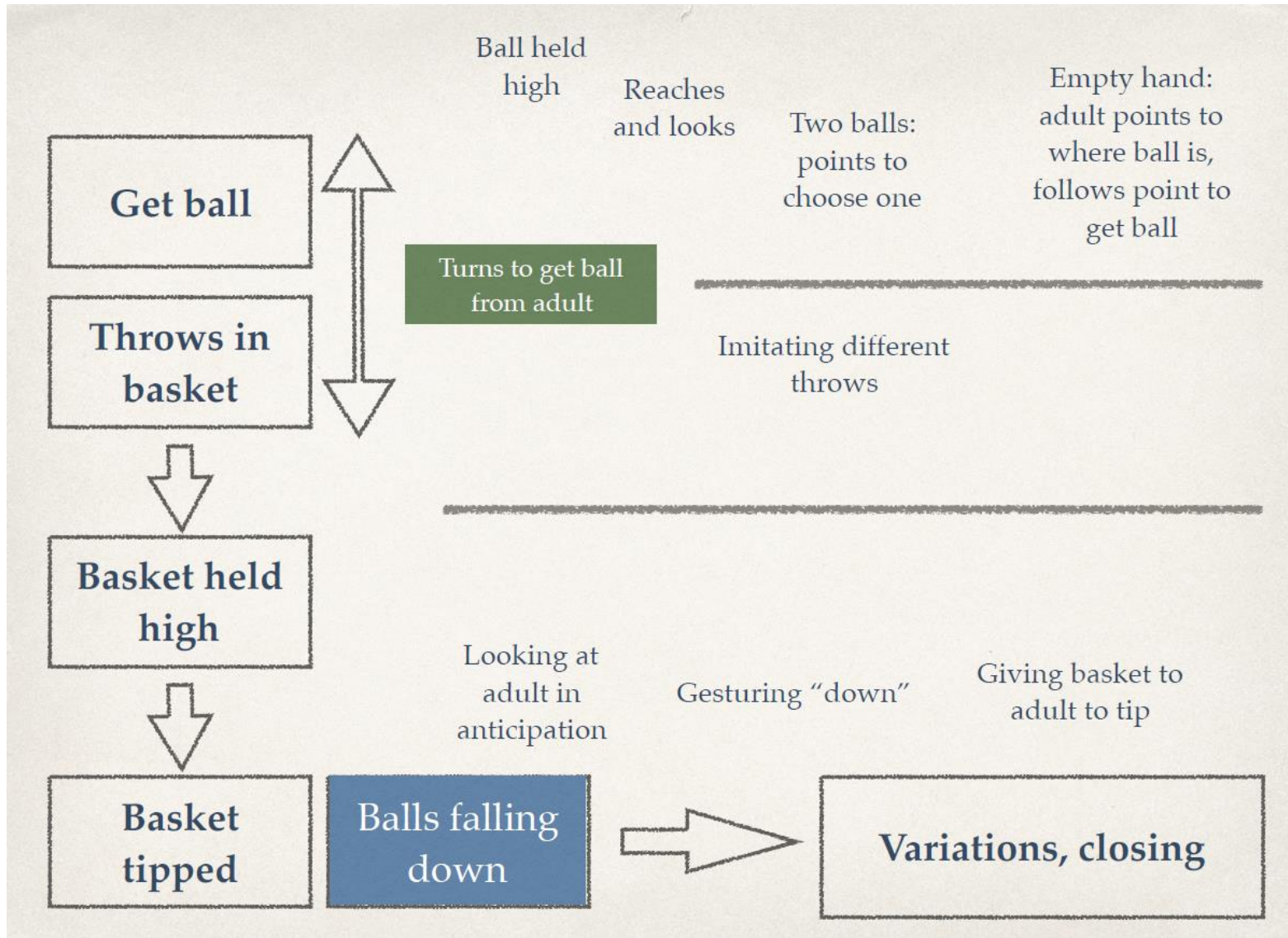
Pause and press

Step 3: add variations

- Bring in variations to the established chain, add steps, change the order, use different objects, mix and match elements from other chains

- This will enable you to bring to shape different behaviours

Step 4: manage transitions

- Watch changes in participation/interest and arousal levels (energy)
- End activity before the child checks out. Give a clear ending signal (e.g., all done and toys go back in box).
- Immediately transition to the next one
- Alternate motivational blocks (high energy low energy): physical and then a sit-down activity

Sensory social: motor or object

- Motor: adult generate reinforcement through his own movement (e.g., spinning, aeroplane, spaghetti arms, tickles, chase)

- Object: adult manipulates object (e.g., peek-a-boo with blanket, swinging with blanket, spinning with chair, up and down the tunnel, bubbles)

- **The received movement is the reinforcer, but the child cannot generate it on his own**

Sensory manipulation

- Pouring water, flour rain with sieve, sand, finger paint, shaving foam, volcano

- Cause and effect toys: pressing, stacking and pushing down, filling and emptying

- **If automatic reinforcement: objective is on social behaviours to obtain it**

- Turn taking: I do it, you do it (tolerance and release)

- Delayed imitation: I do it, you copy - you do it, I copy, you watch me change action - you copy

- Simultaneous imitation: looking, response to changes in actions

Functional close-ended

- Self-corrective materials: insert and jigsaw puzzles, stacking rings, shape sorters

- Completion is likely to be the reinforcer: natural chain, each subsequent piece signaling the reinforcer

- **Social responses in each link (following point to find piece, showing where it goes, shaking head when given wrong piece). The objective is not teaching how to do the puzzle.**

Early board games

- Matching games: Lotto boards or repetitive action games

- These can also be used as functional close-ended games (same objectives)

- Again the objective is not to teach how to match

Arts and crafts

- Colouring, drawing, cutting and pasting, play-dough,

- Different materials to build something together

- **Co-operating toward a final shared outcome:**
  - Coordinated cooperative chain in which the end of a person's action is the start of the other person

Early learner

Profile

Absent mands (grabs) or defective (moves adult hands) Limited social engagement, self-directed, sensory stimulation
Limited or absent: listener skills, functional object use and play-skills, imitative skills. Defective NV conditional discrimination

Objective: establish others as Sds

Maintains proximity and accepts adult giving items
Early social responses (eye contact based: anticipation, following a point, showing)
Mand training: direct MO and transitive MO
Gradual inclusion of activity based adult directed skills (listener, matching and imitation)
Tacting
Teacher objective: To create tens of joint activity routines

Structure (Early Start Denver Model)

- Set up: start of the activity, approach
- Theme: elaboration
- Variation: changes
- Closing, transition: ending
- Interaction: listening, narration, imitation, assistance

Example: throwing balls

	Examples	Social targets	VB: Mands, tacts, pure IV	NV: Receptive, Imitation, Matching
Opening	Setting up, gathering materials: balls, tunnel, basket	Looks at adult and points to activity. Follow adult pointing to get materials	Asks to be picked UP. Points to balls and mands "ball".	R: "get tunnel"
Theme	Throwing balls through the tunnel, picking them up from floor into the basket, throwing them again	Looks up in anticipation of next action. Following pointing to gather specific balls. Laughs at BIG ball not fitting Shakes head to sign NO. Shows after finding hidden ball	Mands: Ball, In, Down Mand: Throw Tact: counting balls IV: ready steady GO	Imitates throwing High, bouncing Matching: adult shows BIG ball, child finds another BIG ball. Shows blue ball, child finds blue ball
Variations	Balls back and forth through the tunnel. Putting them in basket and throwing them all at once onto the floor. Using basket as a target.			
Ending	Tidying up, balls back in the basket, folding tunnel and putting it in bag	Takes it in turns to throw balls back in the basket, puts lid back on and gives basket to put up.	Points to where it should go on the shelf	Matches coloured balls in belonging boxes (e.g. red with red)

SOCIAL ROUTINES LIST

NUM	NAME OF ROUTINE	CHAIN, THEME AND VARIATIONS
1	Trampoline	Run to trampoline, stop by target on floor, jump on trampoline, jump on target, run to second target on floor. V: different jumps (turns, sits, star). Making teddies jump and falling off.
2	Balloons	Finding hidden ballons around the room. Pumping balloon. Making ballon fly away. Chasing to get balloon
3	Balls in tunnel	Gather balls around the room. Racing to get there first. Throwing balls in the tunnel.
4	Animal puzzle	Funny movements with animal puzzle or various actions and animal sounds. Putting puzzles in. Giving them different foods.
5		
6		
7		
8		
9		
10		

Write a list of all your routines and number each one

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Early targets: non vocal social topographies

DATE _____ HOURS: _____										
TUTOR NAME	**ACTIVITY** Record first trial for that routine in each corresponding box: + if behaviour occurred, - if it did not. P for any physical assistance. Write routine number in first row below.									
OBJECTIVES	**4**	**2**	**3**	**1**						**TOTAL 4**
Begins to play on his, accepts tutor's coming near him	+	+	-	-						2/4
Comes when tutor starts activity (joins in)	-	-	-	-						0/4
Goes/comes when called "come here" or given a piece	-	-	+	+						2/4
Anticipatory gestures to continue or start activity	-	+	-	+						2/4
Eye contact to continue or start activity	+	+	-	-						2/4
Vocalises name of item at any point (e.g.,echoes or requests)	-	-	-	-						0/4
Reaches for item (does not touch to grab) - communication response to obtain item	+	+	-	+						3/4
Gives item when he can't do something	-	P	n/o	-						0/4
Stereotipy 0 absent, 1, can be redirected, 2 physical assistance, 3 cannot be reidrected	0	0	3	1						Mean: 1
Helps in closing activity (e.g., puts lid on)	+	+	+	+						4/4
Routine established	yes	yes	no	yes						3/4
Time in activity	2m	4m	1m	3m						Mean: 2.5
Enjoyment (0 if goes away, 1 if he stays with adult (accepts item manipulation) 2 low level engagement (some eye contact), 3 engagement, stays for the duration, smiles, eye and some targets are emerging, 4 high level engagement, laughing and targets can be worked on with no problem behaviour)	1	2	0	2						Mean 1.25

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Vocal and non vocal social topographies

EARLY SOCIAL RESPONSES (2) SOCIAL RESPONDING DATA SHEET EBIC BEGINNER L2

DATE _____ HOURS: _____

TUTOR NAME

ACTIVITY

Record first trial for that routine in each corresponding box: + if behaviour occurred, - if it did not. P for any physical assistance. Write routine number in first row below.

OBJECTIVES														TOTAL
OPENING	Approaching (spontaneously, come here)													
	Joining in (Begins action, imitates, gives item)													
THEME	Imitation and echoing onomathopeic sounds													
	Anticipation/ Communication (points to, gestures to continue, gives object, looks expectantly)													
	Simultaneous listener and echoic													
	Mands with eye contact													
	Shows (show me)													
	Comment completion/ tacts when adult shows or points to something and looks													
	Turn taking													
ENDING	Putting away together													
ROUTINE	yes/no													
VARIATIONS	yes/no managed to present variations													
ENJOYMENT	0 - 1 - 2 - 3 - 4													Mean
DURATION	no less than 5 minutes per activity													Mean

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Early listener and speaker social interactions

EARLY SOCIAL RESPONSES (3) **SOCIAL RESPONDING DATA SHEET** **EBIC1 BEGINNER L3**

DATE _____ HOURS: _____		**ACTIVITY**										
TUTOR NAME		Record first trial for that routine in each corresponding box: + if behaviour occurred, - if it did not. P for any physical assistance. Write routine number in first row below.										
OBJECTIVES												**TOTAL**
OPENING	Approaching (spontaneously, come here)											
	Participation: Initatiates action, imitates, gives object, mands (play, me too, I do it)											
THEME	Imitations for 5 consecutive actions											
	Anticipation/ Communication (points to, gestures to continue, gives object, looks expectantly and vocal mand (here you go, again, look,)											
	Mands with eye contact											
	Tacts objects/pic with eye contact											
	Responds to declarative language- consecutive actions (adult: cat is hungry - makes cat eat)											
	Searches for requested items in the field of min 3 (at distance)											
	Responds to incorrect comments/ silly comments											
	Follows gaze with head turn 90', 45', 0'											
	Stays in actitivity for 10 minutes											
ENDING	Reciprocates comments while putting things away											
ROUTINE	yes/no											
ENJOYMENT	0 - 1 - 2 - 3 -4											Mean
DURATION	no less than 10 minutes per activity											Mean

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Thank you!

degliespinosa@gmail.com

To register your interest for curriculum course:

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