Joint Attention: Development, Impairment and Management

An Essay
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Contents

List of Abbreviations

ABA	:	Applied behavior analysis
ABC	:	Autism behavior checklist
ADOS-G	:	Autism diagnostic observation schedule-generic
ASD	:	Autism spectrum disorder
ASL	:	American sign language
BAS	:	Behavioral activation system
CAI	:	Computer assisted instruction
CSBS	:	Communication &symbolic behavior scales
DS	:	Down syndrome
DTI	:	Diffusion tensor imaging
DTT	:	Discrete trial training
ESCS	:	Early social communication scales
fMRI	:	Functional magnetic resonance imaging
IJA	:	Initiating joint attention
JA	:	Joint attention
MRI	:	Magnetic resonance imaging
NVC	:	Non verbal communication
PECS	:	Picture exchange communication scales
PET	:	Positron emission tomography
PRT	:	Pivotal response training
RJA	:	Responding joint attention
SCATA	:	Social communication assessment for toddlers with autism.
SPECT	:	Single photon emission computed tomography
SRP	:	Son rise program
STS	:	Superior temporal sulcus

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Introduction

To know something together with somebody, both partners need to effectively and openly share it. The easiest and surest approach to share something with somebody is via communication. Communication could be verbal (e.g., “Isn’t that great?!”) or non-verbal by just a meaningful, expressive look.

Communication makes sharing information instantaneous and simple for infants. It provides an indication, confirmation or acknowledgment that attention is shared with no doubt that the otherindividual saw or heard the thing as well. Two persons aren’tin truly joint or shared attention until they both sign (make it mutually manifest or public to each other) that they are **(Gilbert, 2007; Sperber & Wilson, 1986; Taylor, 1980).**

An example can illustrate this. In the event that two individuals are watching a film, everyone realizes that the other is attending to the same thing. However, they are not truly in joint attention yet. What would make the difference—what would turn it into truly joint or shared attention—is if at some point they turn to look at each other to smile about orcomment on an event in thefilm. This look is

not just alternating attention, but its function is to communicate something about what simply happened, and in so doing to share attention to it. Communication turns a commonly experienced occasion into an interaction, into something joint.

Joint attention involves a triadic organization of attention and processing of information. When persons engage in joint attention they attend to and process information about: 1) an object or event, 2) another individual's attention and behavior related to the object, and 3) self-reference information about their own attention to, and experience of the object and the circumstance.

It involves the ability to coordinate one's own visual attention with that of someone else. Joint attention development involves continuous expansion in the ability to engage in parallel or simultaneous processing of information, which involves one's own attention and the attention of other individuals. Infant practice with joint attention is due to the development of a distributed and integrated cerebral areas involving frontal and parietal cortical systems. This distributed network regulates the ability of infants to respond to share experience with others through the social coordination of visual attention. With development, joint

attention becomes internalized as the ability to socially coordinate mental attention to internal representations. As this happens the executive joint attention network contributes vitally to the development of social cognition and human symbolic thinking.

The capacity of the child to engage in joint attention with persons and objects in the world is a fundamental cognitive process requiring perceptual, categorization, memory and information processing abilities. Much research grounded in a social interactional framework **(Tomasello, 1988)** has demonstrated that language input that is relevant directly to the current focus of the child's attention facilitates language acquisition. This shared focus on persons and objects, referred to as joint attention, is typically achieved when the parents provide spoken, auditory linguistic input about an object on which the child is currently focusing visual attention.

Given that a deficit in the function of joint attention mirrors a cardinal feature of autism and that joint attention facilitates other areas of development also impaired in autism, it has been suggested that joint attention should be a priority for early intervention **(Bristol et al., 1996; Klinger & Dawson, 1992; Mundy & Crowson, 1997)** and may be a

pivotal skill **(Mundy & Crowson, 1997; Schreibman et al., 1996).** The associations between joint attention, language and social development suggest that remediating the deficit in joint attention in autistic children can result in positive changes in these other areas as well **(Mundy & Crowson, 1997).**

Aim of the work

The aim of this review is to highlight the relation between joint attention as a basic social communication skill and language development. This is in order to incorporate this ability in assessment and intervention of delayed language children.

Joint Attention: Nature & Types

What is joint attention? Are two people engaged in joint attention when one sees the other looking at something and s/he follows the other's gaze and turn to look at it as well? When two people attend a performance or a talk, are they in joint attention with all the other audience members? Is a child in joint attention when he alternates gaze between his caregiver and a toy? Some authors would reply "yes" to all these questions; others, however, would be more hesitant. The typical understanding of joint attention is that it is interactive like in all the previous examples except the second example is considered parallel joint attention, but there is controversy on whether it is a genuine type of joint attention.

Across time, the definition of joint attention has been pulled in different directions by variousscientists. Some focus mainly on the fact that the two persons are looking at the same thing which could be initiated by gaze following. The classic definition of joint attention, however involves a triadic interaction in which two people coordinate attention between themselves and an object of common interest **(Bakeman & Adamson, 1984).**

Different scientists concentrate more on the coordination aspect of joint attention and the sharing of attention. These scientists argue that attending to the same thing that one's partner is attending to is insufficient for joint attention: additionally, it is vital that the two persons know together that they are attending. Different proponents of this view differ with regard to how, precisely, one may know something together with another person; however, in this view both partners are (at least eventually) equally involved, and must actively share attention about the thing. This sharing is the thing that makes joint attention joint, rather than just parallel, attention to the same thing **(Hobson, 2005; Tomasello, 1995).**

Types ofjoint attention(JA):

There are two main types of joint attention (JA): parallel JA and coordinated JA. Parallel JA is defined as an interaction in which both social partners are attending to the same object or location, but there is no evidence of awareness of the presence of the social partner **(Benigno & Farrar, 2012; Gaffan et al., 2010; Osório et al., 2011; Smith et al., 2009)**. On the other hand coordinated joint attention (JA) is triadic interaction of coordinating attention towards a social partner and an object or location of mutual interest **(Bakeman & Adamson, 1984; Carpenter at al.,**

1998). During episodes of coordinated JA, the person is aware of the presence of the social partner, which is shown by gaze shifts between the social partner and the object or location of mutual interest. Coordinated JA can be subdivided in responding to joint attention (RJA) and initiating joint attention (IJA).

Joint attention can be initiated by either member of the dyad, and likewise it can be responded to by either member of the dyad. Joint attention behaviors in infancy fall into two categories: responses to the bids of others or spontaneous initiations **(Mundy et al. ,2007)**. Responding to joint attention (RJA) refers to infants' ability to follow the direction of the gaze and gestures of others in order to share a common point of reference. Alternatively, initiating joint attention(IJA) involves infants' use of gestures and eye contact to direct others' attention to objects, to events, and to themselves. The function of IJA is to show or spontaneously seek to share interests or pleasurable experience with others, not to request others to bring something.

Even typically developing children widely vary in their tendency to initiate joint attention interactions **(Markus et al. 2000).** So, it is critical to distinguish between propensity of children to initiate joint attention and their propensity to

respond to others' initiations, because these two propensities may not be related to vocabulary development similarly. For example, **Mundy (2006)** reported that typically developing propensity of children to initiate joint attention remains fairly constant across the ages of 9 months to year and a half, while their propensity to respond to bids for their joint attention increases during this period. Therefore, it should not be excessively amazing that frequency of initiating joint attention in typically developing children is not highly correlated with their frequency of responding to joint attention. Of the two child-based behaviors – initiating versus responding to joint attention – it is responding to joint attention that Mundy finds to be highly related with vocabulary development in typically developing children.

It appears that although these behaviors may have similar social functions, they may have diversemotivational parameters. Specifically, it is possible that RJA is maintained by extrinsic reinforcement (i.e., tangible rewards) **(Corkum & Moore, 1998)** but IJAis maintained by intrinsic rewards (i.e., social sharing) **(Mundy, 1995).**