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Editorial

# Teaching Protocols for the Promotion of Derived Learning in Children with Autism Spectrum Disorder and Related Language Deficits

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## Editorial

A research enterprise that I am currently excited about is a collaborative project between our doctoral researchers at the Department of Psychology, NUIM and Dr. Mark Dixon's PEAK/ABA (Promotion of Emergent Advanced Knowledge) research project at Southern Illinois University Carbondale (SIUC). Many behavioural psychologists today are focused on the design of strategic teaching protocols for the promotion of derived learning (i.e., untaught, emergent). This type of learning is based on relational responding; as when a typically-developing child is taught a "same" relation with two identical pictures and then presented with one of those pictures and a picture of a different object, the child may derive a "different/not-same" relation for the latter stimuli and this derived relation emerges without having to be taught separately. Derived relations appear similar in process to the exponential learning that is ubiquitous in the language acquisition of young typically- developing children, but frequently not evidenced in children with ASD and related language deficits. Thus teaching protocols that promote derived learning may be of particular benefit for children with ASD and related language deficits, because derivation may be an essential component of advanced language and cognitive repertoires. The new Peak behavioural teaching applications are based on behavioural research literature on stimulus equivalence [1,3], derived relational responding, and relational frame theory [2]. The capacity for derivation of complex relations is exemplified when a child is taught that stimulus 'A' is opposite to 'B' and 'B' is opposite to 'C', and as a result derives (untaught) that A-C (and C-A) are alike. Put another way, an individual may derive complex relations such as "the enemy of my enemy is my friend", without ever having been specifically taught this, but just on the basis of the initially learned relations (e.g., Jon is my enemy, Barry is Jon's enemy, ergo Barry is my friend). These are rather simplistic examples of quite complex phenomena, but the point is that when an individual can derive complex and extensive relations between stimuli, the learning potential is tremendously increased because not every single aspect of every single stimulus or relation has to be individually taught.

Consider also the human capacity to use arbitrary stimuli to assign particular meaning; for example, in different language contexts we may assign words such as dog or chien or madra to refer to the animal dog (chien and madra are French and Irish translations, respectively). These words are arbitrary in that they bear no physical resemblance to the animal, instead the society designates that this word 'means' this animal. So, if we are taught that the word dog means the animal dog, and then relate chien and madra as co-ordinate words that also mean dog, then all the functions initially taught only for the word dog (e.g., is four-legged, barks, licks, occasionally howls, is furry, is 'man's best friend', may sometimes bite) now emerge for chien and madra, just by virtue of the co-ordinate or 'same' relationship (see equivalence relationship; relational frame of 'sameness'; transfer of functions effects, Hayes et al.[3]). Being able to derive relations in this manner is crucial to an expanded repertoire with multiple levels of complexity such as is involved in human social and language interactions. Yet this amazing ability to readily derive relations between arbitrary stimuli (e.g., words, mathematic symbols) may largely go unnoticed unless it is absent, much as appropriate eye- gaze in a baby girl may seem unremarkable and go unnoticed by a parent, until the next younger baby fails to develop appropriate eye-gaze, at which point the utility of the skill becomes most noticeable to the parent.

PEAK-ABA is an assessment and teaching curriculum tool designed to promote derived learning from the most basic level, and to build gradually in complexity via a systematic and step-by-step learning process. PEAK has been subjected to ongoing systematic analysis to ensure that as an assessment measure it has appropriate levels of reliability and validity, and correlates with other standardised learning measures [5-8]. What is exciting is that already behavioural programmes (e.g., applied behaviour analysis; ABA); early intensive behavioural intervention; EIBI) have gained acknowledgement by many impartial bodies internationally as the most effective available treatment to date for children with ASD and learning difficulties [9], but by combining PEAK with ABA it may be possible to teach advanced skills not previously or typically included in ABA/EIBI intervention programmes. For example, language generativity; metaphor, deceptive speech, sarcasm; flexibility in comprehension of when, or in what context, rule-breaking becomes desirable; exaggeration and irony; all of these are the types of sophisticated skills that in the past were somewhat neglected as ABA language programmes primarily taught the more basic mand (requests) and tact (labelling) or intraverbals (basic conversation).

The research questions our doctoral students want to examine are: whether PEAK- ABA, which was designed to teach children with ASD, is useful also in teaching complex derived relational learning with typically-developing preschoolers, and will such PEAK assessments reveal what level of derived learning is already in the repertoire of these typically-developing preschoolers, and provide an




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index of the more complex relations that they have yet to learn. Such information may then direct the practical development of an optimal PEAK teaching sequence for children with ASD. Also we want to examine if PEAK can be used with children with ASD who have quite 'low-functioning' repertoires, and to teach social skills. And we will attempt to combine PEAK-ABA in computerised interactive teaching programmes that could ultimately be adapted for IPAD or similar tablet devices. Preliminary studies have shown that children with ASD respond relationally with greater speed and accuracy using a computerized teaching tool compared to traditional table-top procedures [10]. Computerised learning programmes cannot and should not replace one-to-one table-top teaching methods with children with ASD, nonetheless, they can provide a means for a child to practice independently and thus supplement table-top teaching. The PEAK-ABA assessment and curriculum tool is said to be moving behavioural teaching programmes to 'the next level', and although it is early days for this protocol, previous research has shown that it is possible to produce derived learning with children with ASD [11-22].

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