

CROSSLEY AND WHEELER – MAYBE THEY’RE BOTH RIGHT?

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Introduction

In 1990 Doug Biklen published a paper in the Harvard Educational Review, *Communication Unbound: Autism and Praxis*, a qualitative study on a method called facilitated communication training developed by Rosemary Crossley, a speech therapist in Australia. Individuals with severe autism were purportedly able to communicate using a keyboard and external touch. Around this time a mother in India, Soma, was working intensively with her son, Tito, in what he describes as the ‘touch method’. Tito had been diagnosed with severe autism. Tito would eventually learn how to type on a keyboard and write independently by the age of six. Sometime in 1991 I began to work with my three-year old son, diagnosed with autism and mental retardation, on a toy where he seemed to push the correct answer to questions given a light touch to his hand. In the early 2000s, Portia Iverson, the mother of another child with severe autism, Dov, and the founder of a research organization Cure Autism Now (CAN), would bring Soma and Tito to the United States. Soma worked with Dov and he would learn to communicate through typing (see strangeson.com).

The purpose of this paper is to challenge the conclusion that there is much more to the technique of supported typing with people with autism, than a simple explanation of guiding the person would explain. The second purpose is to explain why an examination of this method may inform research into movement issues in Autism. Supported typing includes the techniques called Rapid Prompting (www.halo-soma.org), Facilitated Communication Training (FCT) (www.thefci.syr.edu), and the Informative Pointing method (www.strangeson.com). As most of the literature references facilitated communication training, or FCT, this will be the majority of the discussion of this paper, though I believe that the Rapid Prompting Method (RPM), and the Informative Pointing Method also are tapping into the same features of autism that the professionals who advocate for FCT are. I also think this can help to further our understanding of the neural mechanisms of autism, and improve methods for therapeutic treatment.

Facilitated Communication is a technique that has been reported to allow individuals with severe autism and mental retardation the opportunity to demonstrate unforeseen literacy skills (Biklen 1990, 2005; Broderick et al 2001; Donnellan 1992; Crossley 1992; Mabrey 2003; Wurzburg 2004; McKenzie 2008, e.g.). Controlled studies, however, have demonstrated clearly that in a blind testing situation, the person facilitating can influence what is communicated (Wheeler 1993 and Vazquez 1995, e.g.) Adding to the controversy, reports of abuse came from individuals using this technique leading to a backlash (Botash et al 1994; Konstantareas 1998) against a technique that was initially met with skepticism, but many did not see harm in it either.

I propose that given existing evidence, communication through supported typing cannot simply be attributed to the facilitator guiding the person with autism, nor can the communication be nonchalantly attributed to the person with autism. Rather, this is a complex phenomenon that deserves further investigation. This paper attempts to synthesize my personal and professional observations with the current literature on autism, as well as accounts in public media, that have led me to conclude that both proponents and opponents are ‘right’, but that the

individuals with autism, and the science investigating this disorder would be best served by opening the dialogue with a serious and respectful attempt to understand what is happening here.

Why do I think it deserves serious consideration? First, there are numerous reports of individual cases where a person once thought to be severely mentally retarded achieve the ability to communicate by typing (see Biklen 2005, Wurzburg, 2001, Rice 1999 and Broderick 2001), and most of those children only do this through an external cue of some kind and after extensive practice. 2. A close look at accepted techniques such as visual supports and hand over hand prompting are widely accepted components of therapeutic treatments such as applied behavior analysis and PECS (Baer et al 1967; Bondy and Frost 2001). 3. Though much of the evidence in experimentally controlled studies supports that a facilitator can influence what is being said, there are also controlled studies that demonstrate message passing of information unknown to the facilitator by the person with autism or mental retardation (Weiss et al 1996; Sheehan and Matuozzi 1996 and Vazquez, 1994 e.g.).

Motivation and Background

I am a physical therapist who graduated from Northwestern University's Programs in Physical Therapy in 1985. My professional clinical experience has included treating people with Parkinson's disease, Muscular Dystrophy, Stroke, Spinal Cord Injury, Multiple Sclerosis and Cerebral Palsy. The movement differences I have noted in autism are different than my experience with people with the above-mentioned disorders. The movement differences seen in autism can be characterized as more of a cognitive motor disorder, or disorder of praxis. Several studies that have been published in recent years have supported a disorder of praxis (Boria et al. 2009, Mostofsky, 2006, Dzuik ; Dewey, Cantrell and Crawford 2007; Smith and Bryson 2007).

In May of 1988 my son was born and at six months of age he had his first seizure. Kris would eventually have the diagnosis of infantile myoclonic seizures, or infantile spasms, mental retardation, and autistic like challenges. One of the hallmark features of autism is that the child will take another's hand and lead them to the object they want assist with (see Lord et al 2007). Kris would do this for foods, to work the TV, and would also put his hands in yours as though to ask for help when verbally prompted to use a sign for a favorite song or more of a preferred activity. I explored using physical touch in playing with toys with him and I began to suspect that he understood much more than he could get out expressively through the spoken word. My experience as Kris' mom, as well as at a therapy camp we attended with him are the foundation for my initial motivation and interest in movement issues in autism generally, and assisted typing more specifically. For further details on this see Personal and Professional Observations.

Inspired by my experience with Kris after attending the therapy camp, I founded a similar program in his memory (Kris died unexpectedly three months after we attended this camp). Though the therapeutic approach was not clearly operationalized, as a physical therapist and Kris' mom I observed a marked change in Kris' behavior over that one-week program. The initial outline for what we did with the kids at camp was 1. It was to be intensive. 2. We would give the family and the child a 'big bear hug' so that this was a place where they would

feel accepted and comfortable. 3. We would treat the kids with respect and warmth and assume they understood everything we said to them. 4. There would be a strong sensory motor component, as this was the main area of difference I noted in Kris. I refer to this because I feel that I would not have come to my position on communication supports had I not been involved in a program that was extremely positive and supportive for the campers, that also considered movement issues in ASD. Further, that I would not have pursued further investigation into meeting some of the people who used this technique and are now independent in their typing, as well as professionals who have used this technique. It is important to note that the environment of camp, one where the kids were spoken to as though they understood what you were saying, is what I believe allowed me to make different observations than I otherwise would have.¹

Over the next several years of camp, through observation of other therapists and campers who used this technique and first hand experience with some of the campers, evidence began to build that pushed me to the hypothesis that this was keying into a core neurological difference in people with autism (see Personal and Professional Observations). It was only at this point that I felt compelled to attend a seminar in Syracuse, and learn first hand what the professionals there were saying. Though I resisted getting pulled into this controversy, I could not explain what I saw and felt from a simple explanation that in FC the facilitator is leading the typer. And, I also thought the ability to use typing, as a means of communication, was not limited to a few isolated cases.

The presenters at the Syracuse seminar were four individuals who were clearly severely autistic and yet were able to type independently using one finger and one handed typing. Two of the individuals I met were Eugene (see Chapter 6, Biklen 1997), and Jaime Burke, (see Broderick, 2001 and DVD Say Just one Word...). The other two presenters were a man named Tracy Thresher, and a young man named Chandima Rajapatirana. Though Jaime presents with less stereotypical autistic mannerisms, the other three presenters were more similar to Sue Rubin in the autistic mannerisms they presented with (Wurzberg 2004).

As it is difficult to show the reader my observations at camp, or at the Syracuse seminar, the best way I have come up with to exemplify some of the movement difference observations I have made are through the descriptions of the individuals in four documentaries.²

¹ One of the concepts that has fueled this debate is the idea that one needs to assume competence in order to create an environment that allows for the individual with autism to feel comfortable and respected in order to fully observe competent communications. Alternatively, it is argued that by creating an atmosphere of ‘belief’ the facilitators then believe the person’s with autism are communicating when in fact; the facilitators are authoring the communication. It is important to note that while I have had observations where I have observed true communication, I have also had observations where I was skeptical about who was authoring a communication. Again, I don’t think this is can be easily explained by either the conclusion that this is solely the facilitator authoring the message, nor that there is no possibility for influence. Rather, I suggest this a complex neurological phenomenon.

² While the individuals in these documentaries present very differently in their autism, for all, using typing, initially with support, has greatly improved their ability to communicate. One of the critiques of this approach is that there is no indication of exactly who would benefit from this

The first, *First Say One Word*, is written and narrated by an individual who had first used physical support for typing and then went on to read aloud the words that he typed. As previously mentioned, when I went to Syracuse to learn more about their training I met Jaime Burke and three other people with autism who also used the typing, independently but with a person sitting next to them³. The folks who presented were clearly very autistic⁴. Jaime was the least ‘autistic looking’ of the presenters. Their expressive spoken language was limited. One of the presenters, Tracy Thresher, had been inspired by Jaime to start trying to use his voice by reading his words. He did it, but it came out very guttural.

‘Autism is a World’ is the second documentary, which tells the story of Sue Rubin. Sue is another individual who was diagnosed severely retarded who later developed the ability to communicate independently with typing. But, at least at the time of this documentary, she needed someone to sit next to her or to hold the device.⁵ A third documentary is an interview with another woman, Sharissa, who types her communication independently.

Lastly, a recent documentary that aired on HBO, *A Mother’s Courage: Talking Back to Autism* presents individuals who use the Rapid Prompting Method and the Informative Pointing Method. Both of these methods rely on similar strategies, while not emphasizing the resistance used in FC.

FC

A Summary of the controversy

Facilitated Communication, or Facilitated Communication Training as it is now called, is a technique developed to help a person who has motor difficulties access a keyboard so that they can communicate⁶ (Crossley et al 1992). Rosemary Crossley initially used the technique for an

approach. Thus far, the one variable that stands out to me for the nonverbal people with autism who have eventually achieved success at independent typing is that they have benefited from a network of intensive support, and this has taken at times many years to achieve.

³ One of the alternative explanations used is that even when the person typing is independent, he or she is picking up on subtle cues that the person sitting next to him is giving them, as in the Clever Hans phenomenon (see Wegner 2003). Even if this were the case, the number of different cues needed to address each letter of the alphabet as well as punctuation marks would be a phenomenon to study in itself.

⁴ This observation is based on the DSM IV criterion of deficits in social interaction, communication and repetitive or restrictive interests and behavior.

⁵ During Dr White’s initial visit to camp he commented that it appears that the campers were unable to respond unless we approached them first, similar to a disorder in adults called akinetic mutism. Symptoms of akinetic mutism include a profound impairment of movement initiation see pg 866 – Principles of Neural Science. One of the approaches we have adopted at camp is to look at the kids as if they have difficulty initiating, inhibiting and sustaining movement. See *What is the movement like?*

⁶ There seems to be some confusion when reading the literature. When I was initially trained on how to perform this technique it was to give resistance to the person’s hand as they initiate

individual with cerebral palsy, but then used it with others with autism, and reported that many of these individuals had unforeseen literacy skills. Initial studies were qualitative reports and case studies (Crossley 1992, e.g.), but many studies followed that attempted to test for knowledge unknown to the facilitator. Many of these studies demonstrated that when the facilitator was given a different stimulus from the person with autism, there was a strong influence on what was typed, i.e. the word typed was what the facilitator saw, and not the person with autism. In one of the initial studies done with participants working with Rosemary Crossley, they found equivocal results (International Disability Review Panel 1989). Two methods were used to evaluate the communication. The first was a procedure where the facilitator wore headphones, and the facilitator and the person were either given the same or different question. The second procedure was a message-passing task where the facilitator was out of the room when the person was given a gift.

“The validity of the communication while using the “assisted communication technique” was demonstrated in four of the six clients who participated in the two studies. Under controlled conditions the data clearly indicated that the communication of one of the three clients was validated using the “assisted Communication technique”. The communication of the three clients who participated in the message passing exercise was also validated. The validity of the remaining two clients’ communication when using the “assisted communication technique” was not established. However, the absence of data on these occasions does not automatically imply that the clients are not capable of communication. In all three cases of the controlled study, client’ responses were influenced by the assistant. Influence occurred with a client who demonstrated valid, uninfluenced responses to other items. It appeared that a given assistant could influence some client’s responses and leave others uninfluenced. “

One explanation has been that there is facilitator influence on what is being typed, and that is the end of the story. A careful review of subsequent studies reveals substantial evidence for facilitator influence (Mozert 2001), and some, though little, support for independent unknown information passing. These studies include case studies documenting clear message passing with FC, where the facilitator is blind to the stimulus (Weiss et al 1996; Sheehan et al 1996) individual message passing and improved performance noted (Calculator and Singer 1992; Vazquez 1994), and most notably individual reports of people who relied on some kind of physical support who were previously diagnosed with severe MR who now are independent in their typing as a communicative tool (Biklen 2005; Wurzburg, 2004; Broderick 2001). There are many aspects to this phenomenon that have yet to be explained.

A closer look at the underlying assumptions of FC

movement towards the keyboard, then to bring the person’s hand back to a midpoint above the keyboard. There also seem to be some people who get to the point where they independently type, but for some reason, feel the need of a caregiver to sit right next to them. See *Autism is a World*, Tito, and Jaime Burke, Sharissa, e.g. While I am not yet able to explain this neurologically, it appears that even when folks become independent in some manner, they continue to need some sort of external support.

In his 1990 article, Biklen proposes that a deficit in praxis may be a core feature of autism, resulting in a difficulty with expression, rather than a cognitive disability, at least for some individuals with severe autism. The technique of FC includes a facilitator giving some sort of a touch to the person typing, to help them overcome this praxis. At times this can be resistance to the hand, or it can be a touch to the forearm or the shoulder.⁷ Finally, this technique assumes that a nonverbal person with autism may have unforeseen cognitive and literacy abilities beyond what they can be tested for in a standard testing format. So, the mix of a movement difficulty with a high reliance on an external cue, and the ability to communicate through the written word better than the spoken word are all components of this technique.

Comparison of Variables used in Supported Typing Techniques

Rosemary Crossley reported that some individuals with autism appeared to display unforeseen literacy abilities when given an external cue, in this case, she has focused on the physical resistance or external touch cue, but also uses emotional and verbal support with an underlying assumption of competence. Soma (www.halo-soma.org) appears to use a fast paced verbal prompt with some physical cues. If one reads the FAQ's on her website she very distinctly distances herself from facilitated communication, presumably from the controversy surrounding this technique. Though, when reading Tito's account in his interview with Doug Biklen (Biklen 2005), he describes his learning new motor skills through the touch method. He could not hold a pencil at first, so Soma fastened it to his hand with a rubber band (Mabrey 2003). Soma describes her method of rapid prompting as one that 'outpaces the stim'⁸ (Mukhopadhyay, S. 2008). I propose that it is one that provides an external rhythm cue as well as other prompts, including touch to the arm or tapping of the keyboard, or giving the person a pencil to grasp before making a choice.

Portia Iverson, StrangeSon.com, has started a website where parents and support staff can share techniques with each other, and Ms Iverson has put forth a different method, the Informative Pointing Method. In examining the video clip on her website where Dov Sheystack is first typing, Soma uses verbal prompts as well as touch prompts. Common variables in all of these techniques are the use of an external cue of some sort to initiate, or sustain a movement.

Movement Difficulties, External prompts and Reading Ability

Movement differences and autism

If FCT is a valid technique to use with people with autism, then motor difficulties must be central to autism. Though not clearly defined in regards to neural substrates, many more recent studies demonstrate movement difficulties or differences in individuals with autism, including

⁷ When FC was initially explained to me in 1993, I was told to resist the movement to the board. In the last couple years I have learned that the suggestion is to give resistance above the hand. This could possibly prevent guiding of the hand, but would also allow removal of the assistance easier.

⁸ Repetitive behaviors in autism such as hand flapping are sometimes referred to as 'self stimulatory' behaviors. Soma refers to it as 'stim'.

difficulties with imitation (Rogers 2003, 2007), but also with general praxis abilities not accounted for by general motor deficits (Mostofsky 2006, 2007; Dewey 2007; Bryson and Smith 2007; Gernsbacher 2008). A recent study found that when learning a new motor task, children with autism were much more reliant on pathways that transmit proprioceptive information (Haswell et al. 2009). There was also increasing reliance on this the more affected the child was with praxis difficulties.

External Prompting

The second component of these techniques infers that people with autism are more reliant on external prompting than a typical person. One widely used treatment method for treating autism is applied behavior analysis (ABA) (Cooper 2007). Using the discrete trial training technique to teach someone with autism a new motor skill, to overcome what Skinner called the problem of first occurrence, physical prompts, or external cues may be used (Touchette et al 1984). As the movement is learned the prompt is faded. In adult apraxia, a case study showed that individuals with apraxia were able to relearn motor skills through multiple practice sessions, including physical and verbal prompts (Rothi and Heilman 1997). As stated previously, recent studies have evidenced praxis deficits in autism.

In the fall of 2006, I went to a talk given by Dr. Daniel Wegner (Wegner 2003). Dr Wegner was presenting on a study, done with healthy people, where he demonstrated that people could influence what was being typed if they were asked to rely on subtle cues given by another person touching their hand. I asked Dr. Wegner how he would address the evidence that some people who used some physical support have been able to become independent. He responded that one should just wait until the person is independent. A review of the individual stories suggests that this is surely not appropriate either, as many of the individuals who are now independent with communication in typing required some support (Biklen 2005; Wurzburg 2004; Mabrey 2003, e.g.). It is unclear whether they would have achieved this competence had they not been given support.

It is also important to note that some of the individuals who I have come to know through camp have used a computer program to practice typing words during their regular school curriculum. I have observed that many of these individuals come to get stuck on the certain words they continually practice in a rote fashion. They are independent, but they are stuck. It is possible that there needs to be some dynamic interaction in the practice of real communication as a part of the path to someone becoming independent, rather than practicing typing in a rote fashion.

Autobiographical Accounts of Independent Typers and Touch

Tito Rajarshi Mukhopadhyay, whose mother taught him how to type and then write with a pencil by taping it to his hand (Biklen 2005, Mukhopadhyay, 2002) is interviewed in “Autism and the Myth of the Person Alone”. Tito discusses how he learned by the ‘touch method’, pg. 138.

“To think about, I recall that I learnt every skill by the touch method. I have a problem with imitating any movement by looking at people performing or mapping my body according to the instructions given to me. The simple task of holding a spoon and taking the food to my mouth

was also taught to me by a speech therapist for by helping me for the first few times till my habit developed and I could understand how to do it... Sometimes I feel my legs better than my hands. But, I needed my mothers help to learn the tricycle. She had to manually push my legs because I could not do the movement.”

Chandima Rajapatirana (autistic writer from Potamic, Md.) quoted in Time Magazine, May 15, 2006.

"[The] knack of knowing where my body is does not come easy for me. Interestingly I do not know if I am sitting or standing. I am not aware of my body unless it is touching something... Your hand on mine lets me know where my hand is. Jarring my legs by walking tells me I am alive."

New Insights into the hidden world of autism by Claudia Wallis.

Chandi was one of the presenters when I attended the seminar in Syracuse in 2001.

There is evidence of movement difficulties and that children with autism rely on physical assistance to learn a new motor skill.

Reading ability?

Beyond the case studies where people have used some support and learned independent typing, as evidenced by the documentaries I have attached with this document, there is a high incidence of hyperlexia associated with autism (Hsu-Min Chang et al. 2007; O'Connor et al 1994).

Though this is not well understood, it is evidence that some visual pathways that ‘pick up’ on the written word appear to be intact (see connectivity studies in Master’s thesis). Additionally, there is a high incidence of children with autism that enjoy watching Wheel of Fortune (Fillipek et al. 1999): “Some autistic preschoolers are zealous fans of *Wheel of Fortune* or *Jeopardy*, even when still preverbal or minimally verbal; this unusual interest in a preschool child is considered by many to be a hallmark of autism (Allen, 1991).”

Why would the studies have shown such strong influence, as well as a lack of validated communication from the typer, if there were any true communication with this method?

Thigmotaxis

There is a behavioral observation in animal research called thigmotaxis. One example of thigmotaxis is when an animal swims around the edges of a container rather than moving into the middle of the container to find a ledge to climb up on. Animals with different neural connections, or disconnections do this. Children with autism are ‘thigmotaxic’ in that they may tend to walk around the edge of a wall. When we did a pilot study examining gait differences in children with autism, we noted they tended to change the way they walked if there was a different pattern on the floor, or the edge of a rug to walk on. Our best guess at this point is the prompt dependency and ‘thigmotaxic’ behavior seen in autism makes them unusually reliant on external sensory cues.

Other possible confounding factors include testing anxiety and accompanying emotional motor consequences, the experience of the facilitator as well as the FC user, the extended ability to practice a particular test, and processing time and/or difficulties with naming. While there is evidence from some studies of some independent passing of information, the majority of the evidence supports the view that the facilitator can influence what is typed. Alternatively, it also may suggest that the person typing may let themselves be influenced, relying on subtle cues in instances where they may feel less sure. The studies that evidence passing of information unknown to the facilitator appear to control for knowledge unknown to the facilitator by having the facilitator be out of the room rather than using controls such as headphones or visual blocks and use stimuli that are meaningful and/or introduced both through auditory and visual modalities.

In reviewing the literature on autism, relating to my personal and professional experience with this technique and examining the literature on successful message passing and individuals who are independent, I suggest all of the above factors may come into play. This is a method that has been discovered by numerous people in different situations (Biklen 2005; Mukhopadhyay 2002, Berger 2008 Personal and Professional Observations; Crossley 1992; Iverson 2007).

When reading Biklen's 1990 study, I was surprised to find out that the toy that I used with Kris was similar to one used by Rosemary Crossley. Biklen's observations with Louis were very similar to my experience with Kris (See Personal and Professional Observations)

“Crossley introduced herself and me to Louis, who sat between us.... She commenced the session by asking him to press down on various pictures on a talking computer, a children's toy with a voice output that requests the person using it to press various pictures or letters and which announces the user's choice, for example “Right, that's the apple.”

.... She held her arm on top of Louis' right arm. In response to the command, “Press the red car,” Louis put his index finger on it and Crossley helped him push it down. Louis was moving slowly. He seemed tentative. The machine instructed him to find the circle, which he did. He followed with correct answers to square, triangle, circle and triangle. He hit them all, five of five.”

Anxiety and Autism

If there is any truth to supported typing, then conceivably, the participants in an experiment to test valid communication might experience a certain amount of anxiety. Though many of the controlled studies attempt to control for the novel testing situation, it is arguable how much this was controlled. For example, in the 1995 Vasquez study, a cabinet that was used to prevent the facilitator from seeing an object was placed in the room and the participants were encouraged to play with it. How much placing a cabinet in the classroom for weeks before the test allowed the children to adapt to the testing situation is debatable. Also, many studies suggest that the participants seemed to enjoy participation, and suggest that this may have been due to the

attention received. I suggest there are two possibilities, if one assumes that there is any valid ability for communication from the participant, and they rely on a touch cue. First, they were aware of the testing of their ability, or secondly, they were not aware of the ‘stakes’ and were more likely to rely on the facilitator if they were unsure of a word choice, and felt subtle cues from the facilitator (Wegner 2003; Biklen 1997 Chapter 6).

Noteboom et al (2001) found that increased stress impaired steadiness in a pincher grasp in normal individuals, especially for those who scored higher on a trait anxiety survey. It has also been found that people with autism may suffer from anxiety to a greater degree than controls. (Kim et al 2000; Gillot et al 2001). Conceivably, there may have been instances where the participants being tested may have been more susceptible to motor effects of anxiety, and this could have influenced results.

Tito talks about his anxiety and movement (Biklen 2005 pg121).

“... I had to learnt about my body, because I could not feel the pain, or realize it till I was taught. So without knowing anything about the body, how could I apply my body parts to do the different activities, which people do? So when someone asks me to do something manually, I get clumsy. You have to map yourself, map the part of the body you are going to use and time it up, because someone is waiting for you to complete the task. You know that your intelligence or stupidity would get measured by that performance of yours. You tend to get very clumsy. You wonder which to use, your thoughts or your body, because you can use either this or that.”

Emotional Motor and Motivation

In addition to the anxiety issues as noted above, one factor suggested by Biklen and Crossley is that when giving support to individuals, there needs to be an assumption of competence. With typically developing children there is evidence for an effect for teacher expectation on student performance (Jussim and Eccles 1992, e.g.). So, as a student is expected to perform, their performance does improve, irrespective of their abilities. One of the comments I have frequently received from parents who have attended camp for the first time is the unusual way we speak to the kids. Understandably, if a child is diagnosed as mentally retarded, the caregivers around that person would not expect for that child to understand what is said to them. I think that one of the reasons I have observed some of the children at camp communicate where they might not otherwise, is that there is an assumption of competency and respect, and the opportunity to communicate with the written word is available. In my private practice I have visited many group homes and day programs for older teens and adults with disabilities. As a physical therapist I am usually referred to see clients in wheelchairs, but I also have interactions with people with autism, and will address them like I would the kids at camp. I have frequently heard the comment “He doesn’t understand.”

A behavioral analyst (BA) professor, when I asked the question if he thought it would be appropriate to explain to a child with autism why they were setting up a behavior program with him e.g. that they were worried about him hurting himself with self injurious behaviors, responded that it may have been appropriate for a child who had expressive verbal abilities, but not for one that were more involved. “It would not be appropriate.”

Given the evidence from some individuals who were once thought to be severely impaired intellectually, who have demonstrated that they are very capable with the written word, it should be considered that every child should be approached with the assumption that they are competent. Critiques might suggest that this would create an atmosphere of false hope. Even before Kris typed with me, it was a relief when I encountered professionals who spoke to him in a caring, respectful manner. I also suggest this may have played some role in the studies evaluating FC. Many of the studies began with training of facilitators who are teachers or assistants who have been working with the people with autism already, with established relationships with the people they are working with, that were conceivably built on an assumption of cognitive impairment. (Bebko, Perry and Bryson 1996; Eberlin 1993; Bomba 1996) For example, Tito’s experience of learning how to type and write began with his mother assuming he could very early in his life. If that relationship began with verbal and hand over hand prompting techniques, with the presumption that he did not understand, and then Soma started to teach him on the keyboard, it is conceivable that he would have learned to ‘abdicate’ to the physical prompts as one would need to do if someone were leading you. In the Bebko, Perry and Bryson 1996 study, they did observe this abdication pattern in some of the individuals who were able to type some independently. Also, Eugene (Chapter 6, Biklen and Cardinal 1997), an FC user with autism that is attempting to ‘pass’ the Wheeler et al 1993 task states that he is surprised how difficult it is for him not to rely on his facilitator, Mayer, in the blind or distracter condition. Over a year later, Eugene passes the test; see further description below in studies.

Though a belief in the person with autism brings up the image of a mystical or faith based technique (Norton 2006), there is evidence from typically developing children that a teacher’s belief in a student’s potential does factor into their success, and one factor frequently mentioned from individuals now experiencing some degree of independence with their typing is their ability to have a relative or caregiver who believed in their ability to communicate. (Rice 1999; Wurzburg 2004; Biklen 2005).

A heavy reliance on external cueing. Could this lead to an exaggerated Ouija Board effect in distractor Trials? More on the thigmotaxis effect.

Reflecting on variables that need to be present for non-verbal people with autism to learn how to type one factor seems to be some external sensory cue. This can be a touch cue of some sort as in FC, or the prompt of a pencil placed in a hand as in RPM, or can be an external prompt of rhythmic or emotional cues – you can do it – keep going, keep going, e.g. or external tapping on the object to be pointed to make a choice e.g. tapping on the table with two word cards presented to communicate a story intent (Mukhopadhyay, S. 2008; Iverson, P. 2007). It has also been noted that people with autism become dependent on these physical prompts (Bebko et al 1996).

In their 2006 study of praxis in autism, Mostofsky et al reported that the children with autism did better on tasks that had the tool present. Typical tasks that can be assessed for praxis (Rothi & Heilman 1997) are Gesture to Command (GTC), Gesture to Imitation (GTI) and Gesture with Tool Use (GTU). In Gesture to Command tasks, the task is carried out without the tool present. In Gesture to Tool Use, the tool is used. They proposed that the participants did better with tool use because there was a practice effect; the GTU tasks were done after the GTC tasks, and were the same task. As the tasks were not randomized, this was difficult to interpret. In preliminary results in a praxis study that is currently underway, the two children who are lower on the spectrum of autism, i.e. non-verbal, are able to demonstrate movement knowledge when the tool is available. For example, giving a doll a drink with a cup. But, when the task is to pretend without the actual tool present, the movement is not recognizable. Possibly, there is a disconnect in the neural pathway in these two children that allows for the motor engram to be produced without the 'in real time' sensory aspects of the tool being present.

Wegner (2003) did a study to attempt to explain how facilitators could believe there is true communication but where the authorship had come from them. They explored a. How facilitator's intelligence exerts controlled effects on their movements, and b. how facilitator's belief in the ability of the client to communicate leads them to attribute these intelligent movements to the clients.

In experiment 1, typical college students were charged with answering questions randomly, but results revealed that they answered a disproportionate amount of easy questions correct, i.e. they were influenced by their knowledge even though their instructions were to answer them randomly.

The conclusion of this study was that facilitator movement could be influenced by their knowledge of a question, even when they were unaware. A look at the studies that discredit FC shows strong facilitator influence in conditions where the facilitator sees a different stimulus. There does seem to be evidence that this technique can produce a situation where the facilitator can unknowingly transmit cues to the typing person. And, conceivably, the person with autism may rely on these cues. It is also plausible that this has led to horrible consequences as when parents or caregivers have been accused of sexual abuse (Botash et al 1994; Konstantareas 1998). While these are horrible situations, and I think it has affected further investigation to this phenomenon, it does not mean that there is nothing further to investigate. Further, there are cases where reports of abuse have been conveyed with the typing, and further investigation has confirmed the accuracy of the account (Kansas vs Warden 1995).

Practice

Conceivably if anxiety is a factor in the above studies, then studies with extended practice should have differing results. Though few, in the studies that have shown the ability for a person to pass a message, one of the factors of the study is multiple practice trials for a specific paradigm, controlling for possible confounds of factors such as headphones and blocking that may affect the ease of the phenomenon (Cardinal 1996; Biklen 1997).

Differences in presentation of stimuli

In the Cardinal et al 1996 study, the message passing involved passing a written word format to a written word format. In the Peabody Picture Task (Calculator and Singer 1992; Beck and Pivrano 1996), the students that did better with facilitation were variable in when they did better, e.g auditory or visual modality presentation. Michael Merzenich describes possible processing differences in individuals with ASD:

“Tito and several other individuals that we have looked at, have a remarkable ability to talk about a thing that has just been shown to them, for example. Then, on the other hand, not being able to name it. So, this remarkable blindness in the ability to name it. It's as if having seen the thing, the very thing that should drive the naming, the brain is unable to capture the name from just that thing that doesn't mean that the child doesn't know, that Tito doesn't know what that thing is, he can describe it. He can go on and on about where it fits in or what it's associated with, what it's related to. He can see a small toy or a small animal-- he can tell you all about the animal but he can't provide the name of the animal. And perhaps he's been presented with 15 or 20 such things and a half an hour later he's asked again about that test, about that period of his test, and he can recite the names of the 15 or 20 things he's seen in order. So, in fact, he has a remarkable ability to take in this information and to provide in his memory somewhere, in some recess, away from immediate access, the name. But confronted with it up front, in the moment, then names can be very difficult to retrieve, as if the brain is selectively denying the retrieval. So, there's this fascinating breakdown in the sort of immediate act of the naming, and on the other hand, a really remarkable ability to remember. And they're happening at once, in a very unusual, and almost neurologically bewildering form.”

In several of the experimental paradigms that have studied FCT, the main task is to name a picture (Wheeler et al 1993 , Beck and Pivrano 1996, Emerson et al 2001, M. Merzenich, 2002) In two tasks, the PPVT-R and word to word response as in Cardinal et al; 1996, where some validation has been evidenced, the task is to pick a picture from the auditory stimulus, or type a word after the word has been presented visually and auditorily. It is possible that the elements of a task affect the outcome of a study, or in particular translation of a picture format into a word format, may affect the outcome of the study.

Further, looking closely at the replication of the study by Eugene and Mayer (Biklen & Cardinal 1997, Chapter 6) when Eugene initially attempts to pass the test, he seems to attempt to describe the actual item rather than name it. Which is similar to the folks that Michael Merzenich talks about in that they at times attempt to describe and relate to the object rather than name it. Possibly when a person with these difficulties is given the name of an object and then asked to pick it out (Calculator & Singer 1992), the person may do better than when asking to name a

picture he or she has just seen.

Donna Williams, an author with autism, talks in her book “Autism: and inside out Approach”, how it is difficult to process more than one sensory system at a time e.g. auditory and visual, and that it may take her time to process what was said to her, and come up with a response verbally (Williams 2004). In two instances Eugene and Mayer, 1997, and Cabay 1994, there are instances in the blind or distracter condition, where the answer to a previous question is answered in response to a later question. It is possible that differences in information processing pathways plays a role in these studies.

Components of Studies that have shown some independent passing of information

In the initial study done in Australia, two tasks were used. The first was one where the facilitator was blinded from hearing the stimulus with headphones. The second was communication of an object shown to the person when the facilitator was out of the room. Data supported that in a protocol where headphones were used and the facilitator saw a different picture, there was the ability for the facilitator to influence what was typed. There was also some support that the person typing could communicate unknown information. In the protocol where the facilitator was out of the room, and the person with autism was shown something, all three participants with autism conveyed information unknown to the facilitator. All of the participants had been typing with their facilitator a lengthy time (IDRP 1989).

In the studies done since, there is clear evidence that the facilitator can influence what is being typed in protocols such as in the first study above (Wheeler 1993 e.g.). There is also evidence that independent message passing has occurred, as well as documentation of people who became independent with typing (See Wurzburg 2004 Mukhopadhyay 2002, Rice 1999 & McKenzie 2008 e.g.).

The debate over FC seems to have been driven by those who believe it is nothing more than the facilitator influencing what is being typed, and those that believe that there is something in this technique that can be of huge benefit to at least some people with autism. I met a mother recently who is working on her Master’s in Autism. The program she is attending is a behavioral based one. She has a non-verbal child with autism and we were discussing FC. She told me that her professors have told her that they were working on having it banned.

It is possible that the strong views held on this subject have affected the peer-reviewed literature. It seemed odd to me that an important case study such as Tito M would not have been published. Tito was evaluated by Michael Merzenich’s lab in San Francisco. Possibly it was due to issues with the study. My understanding from a personal communication was that reviewers suggested that Tito is an isolated case, not representative of autism. In the forward for Tito’s book (Mukhopadhyay 2002), Lorna Wing talks about Tito and his use of typing and the parallels to facilitated communication:

“The contrast between Tito’s overt, typically autistic behaviors – at one point he grabbed my arm to use it as a mechanical tool to turn a stiff door handle - and the sophistication of language on his alphabet board was truly amazing...Tito had

reached the level of people at nineteen years of age on the Peabody Picture Vocabulary Test. ... This seems to support the proponents of facilitated communication, who believe that all individuals with autistic disorders are capable of expressing complex thoughts if helped by the appropriate physical guidance. It is important to note that Tito showed, very early on, clear signs of good cognitive ability through his recognition and ability to match numbers, letters and shapes.”

Alternatively, in a quote from a WIRED magazine article, Dr Merzenich appears to disagree:

“Mike Merzenich, a professor of neuroscience at UC San Francisco, says the notion that 75 percent of autistic people are mentally retarded is "incredibly wrong and destructive." He has worked with a number of autistic children, many who are nonverbal and would have been plunked into the low-functioning category. "We label them as retarded because they can't express what they know," and then, as they grow older, we accept that they "can't do much beyond sit in the back of a warehouse somewhere and stuff letters in envelopes."

Conclusion

My goal in writing this document was to convey why I think that people with autism have not been well served when it comes to the documentation and study of this phenomenon. There are several individuals who were once thought to be severely MR that now use typing as a means of communication. Most of those who are independent initially required some physical prompt or facilitation. This is a complex phenomenon that we have only begun to understand.

Appendix A

Personal and Professional Observations of Facilitated Communication

Parent Perspective

My first experience with FC

In my first year as a therapist one of my clients was a six-year-old little boy, Max⁹, with a diagnosis of developmental delay. He had no expressive language but had made up his own signs for yes and no. Max could read at the 6th grade reading level following along with his hand (with no one touching his hand.) It was hard to know at that point exactly what he understood - and I moved into a different job before I was able to learn more about him, but he definitely could read the word 'definitely'. His favorite show was Wheel of Fortune.

That was before I was married and 5 years before my son, Kris, was born. When Kris was 6 months old I took him out of the bath one night and set him on a towel. His body began to jerk in what I would learn was a cluster of seizures called infantile spasms. Kris' seizures caused delays that presented in a way that the doctors' called 'autistic like' challenges. Kris was *very* active physically, non-verbal, and diagnosed as severely mentally retarded. Our lives were filled with an obsession over what had caused Kris' seizures and what we could do to stop them. We tried many medications, some less traditional avenues (such as allergies to foods) and two brain surgeries. None of these treatments were able to stop Kris' seizures.

Kris' favorite activities were listening to Joni Mitchell, watching Wheel of Fortune and watching Disney sing along videos¹⁰ and Raffi concert tapes¹¹. When Kris was between 2 or 3 I bought a 'Touch and Tell' toy (what was then fairly high tech where the machine asked you: 'Where is the blue circle?', etc.) As I worked with Kris on this he would reach for my hand to go through the motions. As a physical therapist I was practiced in the art of facilitation – where a therapist helps or guides a person to do a movement, letting them take over when they can. The facilitation of FC is not the facilitation OTs and PTs talk about with NDT (Neurodevelopmental Therapy) and movement facilitation - maybe somewhat of where the confusion comes from. With FC the facilitator actually resists the movement. With facilitation that therapists are trained in for facilitating movement you do guide the client¹². One notable observation with this was that this was an activity that Kris seemed to enjoy and would attend to for longer periods than

⁹ All the names except for Kathy and Kris have been changed.

¹⁰ Disney sing along videos contain cartoon characters singing and dancing to Disney songs. A ball bounces on the words to the song below them as they are sung.

¹¹ Raffi is a children's entertainer who was very popular in the late eighties, and early nineties.

¹² Resisting of the movement is how I initially was explained how to support someone typing. Rather like driving a stick shift, the facilitator supports the person in the middle of the board and then 'lets out on the clutch' as the person goes forward. I have since come to learn that there are many types of support. For some this can be just a light touch at the elbow, forearm or shoulder.

other activities I tried to encourage him to do. There were very few things he would sit down and attend to for very long.¹³

As I worked with Kris on the Touch and Tell he seemed to know his colors and the parts of the house, a dog vs. cat etc. But, his movement was VERY tentative. So tentative that I barely mentioned it to Will (Kris' Dad, my husband) and didn't discuss it with anyone else. Kris had been diagnosed as being severely retarded by a reputable child neurologist, and I wasn't really sure what was happening. Was I guiding his hand?¹⁴

Then one day as my mom was visiting us during a pre-surgery hospital stay, she picked it up and started playing with Kris, as she had watched me do. After a couple of minutes of their play, she turned to me with a bit of joy/cognitive dissonance and more than a bit of surprise. "He knows his colors!" I think I just smiled hesitantly, a little surprised myself. She had felt his initiation as I had. Maybe I wasn't so crazy after all?

Another important aspect to consider was the many days we spent encouraging Kris to sign. He had his favorite songs and we made up different signs to go with them. We encouraged Kris to 'ask' for them. If we pushed Kris in the swing we stopped his swing and encouraged him to ask for more (in sign). He would reach for our hands to 'help' him. Knowing what it was we were asking, but unable to make his body do it.

All of these things played through my mind as I read about facilitated communication. Max, the commonality between he and Kris watching Wheel of Fortune; Kris watching the sing along videos with the bouncing ball, his reaching for our hands to help him. It was possible that he'd taught himself some. And, he certainly seemed to be stuck somewhere motorically.

When I filled out the application to attend Adam's Camp I asked that someone try facilitated communication with him, as I had just become aware of the technique. There were two speech therapists there. One who had used FC and found success, and the other who was not convinced.

The second day after therapy at Adam's Camp, Sari, the FC speech therapist touched bases with me as I picked up Kris. She said he had typed '**fouve**' for how old he was (he had just turned five) and 'doug' for the therapy dog that was there that day.

I wasn't quite sure what to do with this. I was excited, but apprehensive. We had been through so many medication trials and 2 unsuccessful brain surgeries. Nothing had worked. Was it

¹³ I have seen it argued that the reason why the kids will sit for and type with people is that they are enjoying the attention. While this is conceivable, he did not sit for other activities such as coloring, or arts and crafts etc., where I would make overtures to get him to participate.

¹⁴ In Wegner's 2003 study he has the participants try and pick up on subtle cues by having someone lightly touch on the other's hand. The touch was so slight and subtle, that I couldn't be sure that this wasn't what was happening. On the other hand, if this was what was happening, for Kris to sit there and rest his hand in my hand to wait for subtle cues, was rather remarkable in itself. As many professionals who have worked with kids with severe autism know, one of the most difficult things to get the child to do is what you want him or her to.

possible Kris had been able to communicate with us all this time - we just didn't know it? I went home and talked to Will. Of course I would have loved to just embrace it and say, "Of course Kris knows how to spell." I must say though I embraced it more than Will - he was REALLY angry that some young therapist was telling him his son was very smart when numerous doctors at UCLA and the Children's Hospital of Denver had been telling us that he was severely mentally retarded.

We decided that if there was even the remotest possibility of Kris being capable, we had to pursue it. It certainly wasn't a 'miracle breakthrough'. Kris had no interest in typing with us at camp. He would push the board away and cry. I can only imagine it was pretty scary for him, or he just was so unused to it. We had always communicated with him using our words, never really knowing how much he understood. He had always communicated with us by leading us to things or crying. To make that jump with us must have seemed pretty strange. Another interpretation might be that he was limited in what he wanted to say, or that this was all a big hoax.

But, there was to be no typing with us at camp, and there was more than a bit of tension as we discussed it at the final meeting with the therapists. It was obvious to me from the interaction that one of the speech therapists truly believed that Kris could spell. The other was much less convinced. I had great admiration for both therapists and didn't really know whom to believe.

When we left Adam's camp, we drove from Winter Park, CO to Boulder, where my mother in law lived, to visit for a couple of days.

I had ordered a couple of new overlays, including an ABC one, for the Touch and Tell but hadn't had a chance to use them before we left for Adam's Camp. When Will got up with Kris the next morning he got them out and tried them with Kris. His first, hushed as Kris was in the room, words to me as I walked down the stairs later were, "He knows his ABC's! I mean he got a little mixed up between upper and lower case, but he knows his ABC's!"

Relevant to this story is that Will is a man who has a Ph.D. in Political Science and is firmly rooted in the 'numbers crunching' section of that field. He needs to see facts and the scientific studies to prove it. Or, he needs to experience it first hand. That morning with Kris he experienced who was doing the typing and who was not. And, Kris showed him he knew his ABC's.

Of course, though I was certainly less skeptical than Will to begin with, I had yet to have Kris try and communicate anything with me. It was all so strange... how could this possibly be?

Later that day I was upstairs and I heard Kris start crying downstairs. Will was down there with the three kids.

As I walked down the stairs and looked at Will quizzically he said, "I have no idea. He was just sitting in the corner and got upset."

Kris was really upset so I brought him upstairs and started trying his different ‘favorites’ - blanky, music, bath. Kris kept crying and was getting more upset. When I put him in the bath he took a hold of the temperature control turned and looked at me and growled while turning the knob. Though no words were coming out of his mouth he was clearly telling me he was angry and it was my job to figure it out. I can’t tell you how many times I had told him not to play with the knobs, for fear he would burn himself, never really getting a response. Never really knowing if he understood.

Part of why this was so remarkable was that Kris was clearly using this as an exclamation point in his communication. He was most definitely angry and frustrated, and was using turning the knobs while looking straight at me as a way to express this. There was a clear emotion rather than just a ‘generic’ cry. My take on it was he had found a small outlet at Adam’s Camp and realized that he could communicate. It was our job to figure out how to help him get it out.

I took Kris to the letter board Sari gave us from camp. He had been crying rather loudly for the last 10 minutes or more. As soon as we sat down with the letter board he was quiet. I took his hand and gave resistance in a motion away from the board, like Sukhi had showed me. He stuck his finger out and with a lot of resistance and clear movement on his part, typed out Raffi.¹⁵

I asked him if he wanted to watch Raffi and he pointed to the word yes. Thankfully Will’s mom had two VCRs and I took him upstairs and popped in the Raffi tape he liked to watch. He was happy and quiet as a clam. Not only was his movement in the typing very clear, his behavior clearly indicated that this was what he wanted.

I went down and talked with Will. Kris had been watching a video and his younger sister, Chelsea, asked to watch ‘Old McDonald’. Will had told her that she could when Kris’ video was over. A little after that Kris went off to a corner and started twirling a toy doing his ‘autistic’ thing, seemingly not paying any attention. Will figured it was okay to switch for Chels even though Raffi hadn’t ended. I guess Kris did not agree.

Now it wasn’t as if Kris miraculously started typing full sentences with us. As a matter of fact in the next few months he would only type one more time with me. And, that was not real clear. I was in the process of trying to find someone to help me sort through this when he died. It certainly wasn’t a miracle for us, but it was very real. There was no doubt in my mind that Kris had taught himself how to spell at the very least Raffi, and that he knew his ABCs. Also, he had had many opportunities to learn the word Raffi, and to learn the ABCs by watching Wheel of Fortune. I cannot say why this was all he would type, or what was going through his mind, and I didn’t get the chance to know what how much he may have been able to communicate in this way. Based on the experiences I would come to have, I do think that he would have benefited from continued opportunities to type.

¹⁵ I have a pressure gauge that can measure hands strength. The amount of resistance Kris had to push against to bring his hand to the board I estimate as between 1 and 2 PSIs.

My Perspective as a Therapist

When I started Kris' Camp, it was to start an intensive program for kids with autism, focusing on sensory motor difficulties, and giving the kids and families a 'big bear hug'.

My experience in working with children with autism was largely limited to my experience as a mom. But, I wanted camp to be a place where the potentials of the kids were put first. I would try and recruit good, intuitive, positive therapists and take it from there.

The first few years of camp I worked in the therapy room off and on, depending on our need for a motor therapist, but then have worked with the therapy kids for the last few years. I did not use FC or work with autistic kids in my regular PT practice. But, there were therapists who came to camp who did use FC as a tool. There were also therapists who did not and were very opposed. While this created a few headaches at times for me as the director, I could not explain my experience with Kris by examining the studies that concluded that this was solely a phenomenon based on the facilitator guiding the typer's hand.

I kept coming back to Kris' experience and as such could not close that tool out for the kids at camp. But, I had little success with the kids I tried it with too.

Then, the summer of 2000 I had a couple of experiences that sharpened my conclusion that there was much more happening here than a simple cueing¹⁶ explanation could explain. In California we had many kids who do not have ongoing therapy and little to no exposure to the typing, other than camp. Before camp, a therapist had suggested to be careful about holding the letter board for the client, i.e., don't hold it so you can see, but hold it in front of them so they can see. I realized I had been tilting the board towards me.

Three separate children typed with me at different times. Their intention was clear through the event that was happening, and their behavior conveyed this to me. If the FC phenomenon could be explained fully from a cueing phenomenon, why would it be that I often would get no clear communication when I held the letter board more towards me, but did when the letter board was tilted towards the person typing?

One example is that on the last day, we took the group out for lunch at a local deli. Counselors took one or two kids at a time into the deli to pick their sandwich and drink. One therapist had Rob, and helped him out. He had brought his own water bottle, and had not gotten a drink.

As we were all sitting, someone asked about me getting another camper a coke, as this camper was particularly fond of coke. A few minutes went by and then I asked Rob if he was done, he

¹⁶ In the early 1900s there was a horse, named Clever Hans, who could purportedly count and do simple arithmetic. It was later shown that this horse was instead relying on its owner for subtle cues of leaning forward or back to make the correct number of hoof pats. The Clever Hans story is frequently mentioned in discussion of facilitated communication.

pointed to a word card 'No'. But he seemed upset (quiet guy - just pushing his sandwich and water bottle away.) I wasn't sure what was the matter so I brought out the letter board. He typed, and very motorically clear, SODA. So, I asked if he wanted one and he typed yes, then happily got up from the table, went into the store with me and retrieved a soda out of the cooler. His behavior clearly indicated that was his desire.

A second example was at the Arizona camp that year. We had many children who attended the Arizona camp who had been typing on a regular basis. One young man had just started doing some independent typing with his therapist at home, but needed more assist when he was at camp, in a new setting, presumably because he was less confident with all of the therapists he did not know. He typed with many therapists at camp, but seemed to need more support.¹⁷ The last day of camp, he was working on putting captions to his memory book for the week with another therapist. As I walked by I stopped as I noticed the therapist had facilitated him at his forearm and then stopped to write down the caption. But, Bill was a perfectionist and had apparently misspelled something. Seemingly comfortable in that moment he independently deleted two letters, fixed them, and put a period on. It was such a clear example of that move toward independence and I only wish I had been videotaping it.

Why would Bill have needed to have someone touch his hand and pull back as he was typing, only to be independent a moment later? Why would he be independent with his therapist at home but be unable to transfer that into a new setting? I don't know, but my best guess is that there is an emotional component to independent movement. As he felt comfortable and safe, he was able to type independently.

Certainly, there is much still to learn about what is happening with this technique. In many of the experimental studies that have been done there is strong evidence that the facilitator can lead the person typing. But, from these experiences, and from those I have met who are now independently typing, I have come to the opinion that there is much more to this technique than can be easily explained from a simple guiding of movement, or Clever Hans explanation.

¹⁷ I have come to view this technique as a very dynamic support system. These kids seem to rely heavily on some external cue to perform controlled movements. When they are comfortable they seem to have an easier time, when they are less so, there seems to be a need for more support.