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Evidence-Based Communication Assessment and Intervention

ISSN: 1748-9539 (Print) 1748-9547 (Online) Journal homepage: http://www.tandfonline.com/loi/tebc20

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To cite this article: Scott O. Lilienfeld, Julia Marshall, James T. Todd & Howard C. Shane (2014) The persistence of fad interventions in the face of negative scientific evidence: Facilitated communication for autism as a case example, Evidence-Based Communication Assessment and Intervention, 8:2, 62-101, DOI: 10.1080/17489539.2014.976332

To link to this article: http://dx.doi.org/10.1080/17489539.2014.976332

Published online: 02 Feb 2015.

Evidence-Based Communication Assessment and Intervention, 2014
Vol. 8, No. 2, 62–101, http://dx.doi.org/10.1080/17489539.2014.976332

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EBP Advancement Corner

The persistence of fad interventions in the face of negative scientific evidence: Facilitated communication for autism as a case example

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Abstract
Communication disorder and mental health professionals may assume that once novel clinical techniques have been refuted by research, they will be promptly abandoned. Using facilitated communication (FC) for autism as a recent case example, we provide evidence to the contrary. Although FC was scientifically discredited by the mid-to-late 1990s, data we review demonstrate that it is still frequently administered in clinical and educational settings. We examine evidence for FC's (a) continued use as an intervention for autism, (b) persistence in academic and institutional settings, (c) popularity in online and print sources, (d) promotion in the media, and (e) ongoing risk to caregivers accused of sexual abuse. We analyze the sources of these troubling developments, explore their ethical implications, and offer recommendations for addressing the spread of FC and other fad interventions.

Keywords: *Fads; Autism; Autism spectrum disorder; Developmental disabilities; Facilitated communication; Treatment; Science–practice gap.*

INTRODUCTION

> The past is never dead. In fact, it's not even past (Faulkner, 1950).

As Santayana wrote, those who forget the past are doomed to repeat it (see Thomas, 2007). The legacies of pseudoscientific and otherwise unsupported practices in communication disorders, psychology, and allied disciplines impart a sobering lesson: Ineffective techniques may persist long after they have been debunked. Traditionally, fads are defined as short-lived fashions that disappear about as abruptly as they emerged (Best, 2006; Paris, 2013; Vyse, 2005). Nevertheless, the fields of communication disorders, as well as clinical, counseling, school, and educational psychology, have often been bedeviled by a trend that has received scant attention—namely, the propensity of certain interventions to endure in the practice community well after researchers have discredited them (see also Kurzban, 2011, on "zombie psychology," or erroneous ideas about the mind that will not disappear). In this article, we examine a recent example of this phenomenon with an eye to better understanding its sources: the persistence and likely resurgence of facilitated communication (FC) for individuals with autism spectrum disorder (ASD)[1] and other developmental disabilities.

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[1]The formal term for autism in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM–5; American Psychiatric Association, 2013) is now autism spectrum disorder. Nevertheless, because most of the literature on FC antedated DSM–5, we use the terms "autism" and "autism spectrum disorder" interchangeably in this manuscript.

This article was originally published with errors. This version has been amended. Please see Corrigendum (http://dx.doi.org/10.1080/17489539.2014.1026026).

Many communication disorders and mental health professionals are probably aware that in the early 1990s, FC became immensely popular in educational and clinical circles as a means of establishing expressive communication among nonspeaking individuals with autism and other disorders (Green, 1994; Green & Shane, 1994). They probably also know that by the mid- to late-1990s, FC had been convincingly refuted by controlled research and overwhelmingly rejected by the scientific community (Jacobson, Foxx, & Mulick, 2005; Jacobson, Mulick, & Schwartz, 1995; Mostert, 2001, 2010; Probst, 2005; Shane & Kearns, 1994).

Professionals in the fields of communications disorders and mental health may therefore be surprised to learn that FC remains alive and well in much of the mainstream autism and developmental disabilities community, and that it seems to be staging a broader comeback (Hagen, 2012; Heinzen, Lilienfeld, & Nolan, in press; Travers, Tincani, & Lang, in press). In this article, we examine evidence for the surprising persistence of FC and explore the implications of this phenomenon for communication disorders, psychology, psychiatry, and allied fields. Before doing so, however, we place FC within the broader context of fads in mental health.

THE PSYCHOLOGY AND SOCIOLOGY OF FAD TECHNIQUES

Researchers and practitioners may assume that once a novel technique has been demonstrated to be ineffective, it will be rapidly abandoned by its proponents. For example, Shorter (2013) pointed to "scientific disproof"—that is, "demolishing a notion with scientific data" (p. 557)—as one of two approaches to putting a halt to psychiatric and psychological fads, the other being scientific consensus regarding a technique's ineffectiveness. Indeed, in attempting to explain why secretin and vision therapy, two interventions once widely embraced for the treatment of autism, had declined markedly in popularity, Huang, Seshadri, Matthews, and Ostfeld (2013) conjectured that "these interventions have been formally studied and found to be ineffective" (p. 750). In an overarching analysis, Overholser (2014) proposed the "modal life cycle" of psychological fads. According to Overholser, toward the end of this life cycle:

> The fad is evaluated in a more objective manner (Carson et al., 1999). A state of disenchantment ensues. Results tend to reveal the true mediocre effectiveness and common limitations of the new approach. As evidence accumulates, the fad may be dismissed and quietly discarded, as is the fate of many fad innovations. Alternatively, some fad ideas (e.g., systematic desensitization, dialectical behavior therapy) are found to be effective and they become integrated within modern accepted practices. (p. 53)

Overholser's description implies the existence of two principal routes for fad interventions: Such techniques are either (a) scientifically discredited and then promptly jettisoned (e.g., Huang et al., 2013) or (b) corroborated by scientific research and then assimilated into the mainstream of clinical practice.

In contrast, we posit the existence of a third pathway, as exemplified by FC. In this alternative trajectory, the fad method is refuted by scientific evidence. Or, closer examination reveals that the technique was devoid of scientific plausibility. Even so, the fad persists, and sometimes thrives, in "underground form" in sizeable sectors of the clinical or educational communities. The fad may acquire a sufficient cachet of respectability to be tolerated as a fringe

activity within otherwise reputable professional groups and scholarly departments. Its popularity will often be sustained by the activities of members of tightly knit, social-media-based support groups. Or, it may become normalized because the number of researchers concerned about its credibility is extremely low. Although these conjectures are plausible, scant attention has been devoted to the theoretically and pragmatically important question of why certain fads collapse under their own weight after being discredited, whereas others endure and even flourish. The largely untold story of FC's persistence, we contend, may shed light on this conundrum.

Two high-profile examples in addition to FC illustrate the third pathway for fad techniques (see also Finn, 2008, for illustrations in the communication disorders field). First, we consider the immensely popular Drug Abuse Resistance and Education (DARE) program, with its ubiquitous bumper stickers and T-shirts. Developed in 1983 by the Los Angeles Police Department, DARE asks uniformed police officers to enter schools to warn students about the perils of drug use. Controlled data consistently show that DARE is ineffective for decreasing schoolchildren's risk for substance abuse (Lynam et al., 1999; Pan & Bai, 2009). Despite this evidence, DARE remains immensely popular; according to the program website, it has been implemented in 75% of U.S. school districts and 43 countries (Lilienfeld & Arkowitz, 2014). A second example is the persistence of beliefs regarding the use of suggestive techniques, such as hypnosis, guided imagery, and repeated prompting, to recover ostensible memories of childhood trauma. Most controlled data suggest that these techniques confer a substantially heightened risk of false memories in many individuals (Loftus, 1993; McNally, 2003) and that genuine recovered memories unearthed in psychotherapy are exceedingly rare and perhaps nonexistent (Geraerts et al., 2007). Nevertheless, recent survey data point to a sizeable science–practice gap in beliefs concerning recovered memory techniques (Patihis, Ho, Tingen, Lilienfeld, & Loftus, 2014). For example, although only 16.1% of clinical psychology researchers agreed that "repressed memories can be retrieved in memory accurately," this percentage was 43.1% among clinical psychology practitioners. It was even higher among psychoanalysts (47.5%) and hypnotherapists (54%).

In the case of FC, DARE, suggestive memory techniques, and other scientifically discredited but still widely used techniques, such as energy therapies for trauma (see Pignotti & Thyer, 2009, for a review), we can observe a fairly consistent life cycle. Researchers subject these methods to empirical scrutiny and find them to be largely or entirely wanting.

Soon after, scientists who initially had an interest in subjecting the fad to controlled investigation may move on to pursue other topics. Academic researchers may see less of the fad, or at least less active controversy, and assume incorrectly that it has been all but abandoned by practitioners. In the words of Mostert (2010):

> Optimistically, perhaps, empiricists assume that when any intervention is clearly demonstrated to be ineffective (or even harmful) and that its ineffectiveness is clearly communicated to the field, practitioners will usually implement more effective interventions. However, as with other suspect approaches throughout the history of special education, this is often a false assumption and certainly a problematic assumption regarding FC. (p. 39)

In this third pathway, what would otherwise be a passing fad transmogrifies into a "chronic malignancy" (Kozloff, 2005; Paris, 2013), a dubious idea that takes on a life of its own, becoming entrenched in clinical or educational practice. The surprising and largely unknown story of FC's persistence may shed light on this puzzling phenomenon and, more generally, on the "science–practice gap"—the wide chasm between the research evidence for interventions and their routine clinical use (Lilienfeld, Ritschel, Lynn, Cautin, & Latzman, 2013; Tavris, 2003).

For three reasons, the tenacity of FC should be of paramount importance to professionals in communications disorders and mental health. First, because FC (a) often instills false hopes among parents and other loved ones of individuals with autism (Todd, 2012), (b) has been associated with numerous uncorroborated allegations of abuse among the caregivers of individuals with autism (Boynton, 2012; Konstantareas & Gravelle 1998; Margolin, 1994), and (c) may incur opportunity costs, such as forgoing effective treatment (e.g., Moon, 2010), FC's continued use is of substantial concern in its own right. All of these considerations suggest that the false hopes spurred by FC are far from innocuous for individuals with autism and their caregivers. Second, the tale of FC's persistence may offer valuable clues concerning the broader question of why certain fads become extinct, whereas others evolve into chronic malignancies (see Paris, 2013). Third, FC's persistence affords a powerful object lesson regarding the real-world perils of the science–practice gap and raises important questions regarding professionals' and academics' ethical obligations in the face of scientifically discredited but still widely practiced interventions. In particular, the tale of FC reminds us that treatments that have been refuted in the pages of academic journals may continue to prosper in the undergrounds of the clinical and educational worlds. Many communication disorders specialists and psychologists may assume that once they have conducted studies to expose the ineffectiveness of a novel intervention, their work is essentially done. The story of FC's persistence in the face of negative data implies a different conclusion: Their real work may have just begun. In this respect, their task is not fundamentally different from that of researchers who have demonstrated the efficacy of a novel intervention, whose most daunting challenge is often the dissemination of this technique to potentially reluctant practitioners (Lilienfeld et al., 2013).

HISTORY OF FACILITATED COMMUNICATION: A REPRISE

The early history of FC has been recounted extensively in a variety of sources (Dillon, 1993; Green, 1994; Hudson, 1995; Jacobson et al., 1995; Offit, 2008; Shane, 1994). Hence, we reprise it only briefly to provide readers with a historical context for more recent developments.

The spectacular rise of facilitated communication

By the late 1980s, the overwhelming academic and clinical consensus was that autism is a largely neurological condition. In addition, there was nearly universal agreement that autism is often or usually associated with intellectual disability and that severe impairment in communication is a core feature of the disorder. For example, the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM–III*; American Psychiatric Association, 1980) listed "gross deficits in language

development" (p. 89) as a necessary criterion for the diagnosis of infantile autism. Consistent with this view were findings that a substantial proportion, perhaps half, of individuals with autism are largely or entirely mute (Rutter, 1968). These individuals were widely assumed to be not merely uncommunicative, but incapable of anything but the most rudimentary language. For many communication disorder and mental health professionals, however, that overwhelming consensus was about to change.

The FC story traces its roots to 1977 to St. Nicholas Hospital, an institution for individuals with intellectual and physical disabilities in Melbourne, Australia (Crossley & McDonald, 1980). There, staff member Rosemary Crossley developed a technique—which she originally termed "facilitated communication training"—for purportedly extracting communication from individuals with serious physical disabilities that often precluded speech, such as cerebral palsy (Jacobson et al., 1995). Nevertheless, it was soon implemented for a host of other conditions, ranging from autism to coma (Palfreman, 1993).

The premise of FC was straightforward: Despite outward appearances, widespread beliefs, and rigorous standardized cognitive testing, nonverbal people with autism and other developmental disabilities are usually of reasonably normal intelligence. Nevertheless, they cannot express themselves due to a neurological condition that came to be known as "developmental" or "oral–motor" apraxia, a hypothesized disconnection between the motor and language systems of the brain that precludes direct communication (Biklen et al., 1992). Although apraxia is a genuine neurological condition, the notion that it would prevent a person from being able to point to letters on a keyboard or letter board is entirely unsubstantiated. Nevertheless, Crossley and others proposed that with the aid of a facilitator who stabilizes the person's hand movements, the individual can type out words and sentences by sequentially selecting letters on a keyboard, keyboard facsimile, letter pad, or similar device (Biklen et al., 1992; Crossley & McDonald, 1980). Over time, direct physical control of the hand or wrist by the facilitator is faded up the arm to the shoulder, and eventually removed (Crossley, 1994).

Over time, the activities at Crossley's Melbourne center came to attract increasing attention. There, in 1989, Douglas Biklen, sociologist and Professor of Special Education at Syracuse University, observed Crossley's methods and promptly unveiled the startling news of FC's apparent effectiveness in a 1990 article in the *Harvard Educational Review* (Biklen, 1990). According to Biklen, 21 individuals who could not otherwise communicate or function independently had typed their thoughts and conversed with him at previously unheard-of levels of linguistic and cognitive sophistication. Many composed eloquent poetry that told of their profound joy at being liberated from a life of silence. Some even typed the first time a facilitator provided support, thereby ostensibly revealing "hidden literacy" (see Biklen et al., 1992; Konstantareas & Gravelle, 1998).

Biklen and a growing number of collaborators in the United States soon incorporated FC into the academic and clinical mainstreams. Within two years of the publication of his 1990 article, and before he or others had conducted any methodologically sound research in support of FC, Biklen founded the Facilitated Communication (FC) Institute at Syracuse University. This institute promoted FC, but did not encourage or conduct controlled studies to subject the central question of the authorship of FC communications to stringent tests.

Soon, FC training workshops were established and grew exponentially in

popularity, attracting thousands of participants, many of whom observed live facilitated presentations. Brochures and training materials were printed and distributed to thousands, and probably tens of thousands, of would-be facilitators. A newsletter, the *Facilitated Communication Digest,* soon followed. Additional centers of activity arose at the University of Maine and the University of Wisconsin–Madison. FC instructional manuals were widely disseminated (e.g., Berger & Kilpatrick, 1992; Olsen, Gurry, Larkin, & McSheehan, 1992). Credentialed practitioners, teachers, parents, and lay enthusiasts, many trained by Biklen's associates in Syracuse-sponsored workshops, began administering the technique in schools, homes, and treatment centers (Palfreman, 1993; Wheeler et al., 1993). Children who could not toilet themselves independently or be left alone were placed with facilitators in typical classrooms. It would not be long before FC was used in college courses to assist students with note- and exam-taking (Kochmeister, 1999).

The rise of FC was abetted by the news and entertainment media. In addition to articles and notices in academic outlets, in 1991, Biklen was featured in a piece in the *New York Times Magazine*, which touted FC as a remarkable innovation in autism treatment. Soon, dozens of newspapers and magazines, including *Reader's Digest*, *Parade* magazine, *USA Today,* and *The Washington Post*, published laudatory stories on FC, most without noting that the technique had not been subjected to controlled tests (Mostert, 2012; Mulick, Jacobson, & Kobe, 1993). In 1992, ABC's *Prime Time Live* television show featured a segment on FC, with host Diane Sawyer introducing the piece by informing viewers that:

> For decades, autism has been a dark mystery, a disorder that seems to turn children in on themselves, against the world. Tonight, however, you are going to see something that has changed that. Call it a miracle. Call it an awakening. (See Palfreman, 1993)

Popular books, often written by, or with the collaboration of, academic authors, extolled FC's benefits (e.g., Martin, 1994; Sellin, 1993).

FC had launched a revolution. It appeared to be a breakthrough not merely in the treatment of autism, but in our very understanding of the condition. Individuals with autism, FC advocates and most media outlets proclaimed, are cognitively and emotionally normal people trapped inside of an abnormal body.

Facilitated communication and sexual abuse allegations

It was not long, however, before a dark side to FC emerged. Along with the poems and school assignments, uncorroborated facilitated allegations of sexual abuse implicating numerous parents and caregivers—a problem already seen in Australia—began to appear (Palfreman, 1993; Rimland, 1992a, 1992b, 1992c; Shane, 1994). A 1994 review unearthed five dozen such cases, with untold numbers of others never reaching public visibility (Lilienfeld, 2007; Margolin, 1994). In several instances, children were removed for an extended time from their parents. Some people were jailed, their reputations perhaps permanently tainted by the horrific accusations (Gorman, 1998; Palfreman, 1993). In one 1991 case in upstate New York, a 14-year-old girl with autism, Jenny Storch, was removed from her home after her facilitator generated over 200 brutal rape allegations against her father Mark. These accusations were never corroborated. Mark Storch, who spent time in jail awaiting trial, sued Biklen and Syracuse University for $10,000,000 for

their roles in promoting FC in the absence of scientific evidence, but lost on First Amendment grounds.

The reasons for these and other abuse allegations are unknown. Because individuals with developmental disabilities, including those with ASD, are frequently victims of sexual abuse (Brown-Lavoie, Viecili, & Weiss, 2014; McEachern, 2012; Sullivan & Knutson, 2000), however, some facilitators may have been suspicious of the caregivers of children with autism. Moreover, the view that sexual trauma lies at the core of many or most forms of psychopathology, including autism, remains common in some segments of the psychological and educational communities (e.g., Ross and Pan (1995)). These hypotheses aside, the majority of FC-produced abuse allegations were never corroborated, and most cases were dropped prior to trial (Howlin, 2011; Margolin, 1994). Even the few accusations that were seemingly confirmed by confessions or other evidence were not corroborated by a methodologically sound validation of the subject's ability to communicate with FC, and may have been contaminated by facilitators' independent knowledge of the parents' history (Botash, Babuts, Mitchell, O'Hara, Lynch, & Manuel, 1994; Lilienfeld, 2005). Moreover, the number of caregivers accused of abuse may have been sufficiently high that at least a few might have been guilty by chance alone. In any case, it is evident that these accusations, many of which were immensely destructive to families, were based on insufficient evidence.

THE SCIENTIFIC DISCREDITING OF FACILITATED COMMUNICATION

Within a few years of FC's introduction to the United States, researchers began to do what FC advocates had not: subject the technique to rigorous controlled investigations. The source of messages arising from FC is readily ascertained and can be detected using methods established centuries ago (Mill, 1846; Pfungst, 1907; Wilkens, 1641). In general, two experimental paradigms have been used to examine FC, both of which hinge on controlling and accounting for the transmission of specific information to each participant (Shane, 1994). In the first method, the "message passing" paradigm, researchers typically display a simple object or word, give an instruction, or ask a question with the facilitator either (a) present with or (b) absent from the participant. The participant is then asked to respond appropriately. Facilitation in Condition (a) is usually successful and establishes that the setting is favorable for facilitation. The question is whether facilitation in Condition (b) will be similarly successful. If authorship of the communication is attributable to the subject, it should not matter whether the facilitator saw the item in question. In the second, "double-blind," paradigm, the facilitator and subject each receive the same or different information, instructions, or questions, each unaware of the other's experience. If authorship of the communication is attributable to the subject, the output should correspond to the subject's experience. If the response instead corresponds to the facilitator's experience, facilitator control is demonstrated.

The outcomes of early experimental tests on FC were overwhelmingly negative, and nothing has changed in subsequent years to alter this conclusion (e.g., Bomba, Markowitz, O'Donnell, & Holmes, 1996; Moore, Donovan, & Hudson, 1993; Salovitta, Lepannen, & Ojalammi, 2014; Shane & Kearns, 1994; Smith, Haas, & Belcher, 1994; Wheeler, Jacobson, Paglieri,

& Schwartz, 1993). As summarized by the American Psychological Association (APA) website on FC, "The short version of this long story is that study after study showed that facilitated communication didn't really work" (APA, 2003). Specifically, the results of properly controlled studies revealed consistent evidence of inadvertent facilitator control over the communications: Reliably correct responses were typed only when the facilitator was aware of the relevant information. Moreover, in double-blind studies, when words were typed, they virtually always corresponded to the stimuli seen by the facilitator. In the 19 well-controlled studies of FC performed prior to 1999, the number of successful validations of FC was 0 of 183 (Gorman, 1998; Lilienfeld, 2005). The results of the initial negative tests on FC were portrayed in an influential *Frontline* documentary, "Prisoners of Silence" (Palfreman, 1993), which aired in late 1993. This documentary, conjoined with a critical CBS *60 Minutes* exposure ("Less than a Miracle") in early 1994 (Eisen, 1994), helped to slow, but by no means halt, the FC bandwagon.

A scientific consensus emerges

By now, the scientific verdict was clear. FC is ineffective and "works" only when facilitators know the answers (Montee, Miltenberger, & Wittrock, 1995; Schlosser & Wendt, 2008). Furthermore, FC is a striking case of the *ideomotor effect*, which had been known in psychological circles since at least the mid-nineteenth century (Hyman, 1999; Stock & Stock, 2004; see also Skinner, 1934). This effect, illustrated by such purported paranormal phenomena as Ouija boards, automatic writing, table tipping, dowsing, and the Chevreul Pendulum, refers to the propensity of people's thoughts to influence their movements without their awareness (Wegner, 2003). By means of mutual operant shaping, the facilitator and subject gradually learn to adjust to each other's subtle movements. Over time, facilitators become convinced, and frequently insist, that they are merely offering resistance to the child's hands, not actively guiding them (e.g., Rubin & Rubin, 2005). Yet, the data on FC clearly demonstrate that they are in control, even though they are typically unaware of their inadvertent authorship of the messages (Kezuka, 1997; Shane & Kearns, 1994; Wegner, Fuller, & Sparrow, 2003). This problem of unconscious bias and signaling has sometimes proven difficult to manage even for researchers trying actively to minimize it (Rosenthal, 1985; Sebeok & Umiker-Sebeok, 1980).

The consensus that FC is ineffective was essentially universal in the scientific community by the mid-to-late 1990s (Mulick et al., 1993; Romanczyk, Arnstein, Soorya, & Gillis, 2003; Shane, 1994). By then or not long afterwards, the American Psychological Association, American Psychiatric Association, American Academy of Child and Adolescent Psychiatry, American Association on Mental Retardation, American Speech-Language-Hearing Association, Association for Behavior Analysis, Behavior Analysis Association of Michigan, American Academy of Pediatrics, American Association on Intellectual and Developmental Disabilities, and New York State Department of Health, among other professional organizations, had issued policy statements declaring FC to be an ineffective or at best unsupported for autism (Lilienfeld, 2005; Mazerolle & Legosz, 2012).[2]

[2]After declining to follow suit for two decades, The International Society for Augmentative and Alternative Communication issued a policy statement criticizing FC in 2014 (International Society for Augmentative and Alternative Communication, in press).

Still, Biklen and his colleagues remained undaunted. They responded to the negative scientific evidence by insisting that the controlled tests were flawed. In particular, they maintained that these experiments placed individuals with autism in "confrontational" and otherwise stressful testing conditions, thereby impeding their capacity to communicate successfully (Biklen & Cardinal, 1997; Crossley, 1994). Nevertheless, this ad hoc hypothesis is difficult to reconcile with observations that these same individuals could facilitate successfully (a) in front of television cameras, (b) before hundreds of onlookers at FC conventions (Palfreman, 1993), (c) in school while taking graded examinations and performing assignments, and (d) during presumably anxiety-provoking sexual abuse interrogations (Todd, 2012).

In other cases, FC proponents pointed to some apparent successful instances of FC in experimental studies (e.g., Calculator & Singer, 1992; Cardinal, Hanson, & Wakeham, 1996; Vazquez, 1994). Nevertheless, as Mostert (2001, 2010) and other critics (Green, 1994; Probst, 2005; Todd, 2012) noted, these scattered positive reports do not provide support for FC.

Several are not controlled, direct validations of authorship (e.g., Janzen-Wilde, Duchan, & Higginbotham, 1995; Rubin et al., 2001). Of those that might qualify as genuine controlled analyses, all are marked by serious flaws: the possibility of facilitator cuing, prior facilitator access to the stimulus materials, lack of blindness of data collection, absence of control over practice effects without FC, evaluation of behavior other than expressive communication, no demonstration of reliable communication, and absence of pretests to demonstrate that individuals were incapable of written communication without FC (see also Cummins & Prior, 1992; Jacobson, Foxx, & Mulick, 2005; Lilienfeld, 2005). Indeed, arguably the most consistent finding in the FC literature has been that the better controlled the study, the less likely it is has been to detect evidence for FC (Mostert, 2010). A review of more recent literature (Mostert, 2010) yielded equally unsupportive conclusions regarding FC's effectiveness.

Finally, there have been numerous reports of individuals who have achieved "independent typing" and even speech after supposedly being weaned off FC (e.g., Bernardi & Tuzzi, 2011; Biklen, 2005; Broderick & Kasa-Hendrickson, 2001; Kasa-Hendrickson, 2006; Robledo & Donnellan, 2008; Rubin et al., 2001). Many FC advocates have assumed that a transition to independent typing validates the earlier assisted typing (Biklen & Cardinal, 1997). Nevertheless, these reports are anecdotal and have never been corroborated in independent controlled studies. Furthermore, even if an individual became capable of typing with no aid whatsoever after FC, we should conclude neither that the facilitated typing was genuine nor that FC engendered the ability. It is at least equally plausible that FC delayed the onset of functional communication by reducing its need (e.g., Mostert, 2001, 2010; Shane, O'Brien, & Sorce, 2009). In addition, it is puzzling that established FC typists continue to express basic needs, such as hunger or thirst, through independent typing, yet create lofty, philosophical expressions only when facilitated (Shane, 1994). It is also difficult to explain why the augmentative and alternative communication (AAC) technologies that lead routinely to independent communication by the most severely physically disabled (Sigafoos, O'Reilly, Lancioni, & Sutherland, 2014) are not similarly successful with (and apparently are only rarely introduced to) individuals who allegedly require FC.

Premature proclamations of FC's demise

An inspection of published sources post 2000 suggests that many authors harbored the belief, or at least the hope, that FC would be abandoned soon after its discrediting by scientific research. For example, prominent science writer Martin Gardner (2001) wrote that:

"For example, Although a voodoo science seldom completely evaporates, one can hope that the FC farce, involving a mysterious malady more pervasive around the world than Down's syndrome, is finally coming to an end (p. 19)." Other authors apparently concluded that FC had been essentially abandoned following its refutation. Maxwell (2004) wrote that "A particularly salient cautionary tale for qualitative researchers is the *rise and fall* of facilitated communication as a method for working with autistic and severely retarded persons" (p. 37; emphasis added). Similarly, in 2005, prominent autism researcher Bernard Rimland authored an article entitled "Facilitated Communication —Its Rise and Fall," which documented the meteoric ascendance and subsequent collapse of FC. More recently, Bengston and Marshik (2007) maintained that "the technique [facilitated communication] is nowadays rarely used" (p. 2). Nevertheless, to paraphrase Mark Twain, rumors of FC's demise proved to be exaggerated. Recent survey data demonstrate why.

SURVEY DATA ON FC'S RECENT USE AND MEDIA COVERAGE

> *Facilitated communication? My God—I thought we stuck a stake through its heart in* 1997. *(Alan Zweibel; in Dickerson,* 2008*)*

As is evident from our review of the literature, FC had been soundly discredited by the mid-to-late 1990s. Hence, we can safely regard any surveys on FC's use conducted following the onset of the new millennium (post 2000) as offering a rough gauge of this intervention's persistence following its empirical refutation. The survey literature on FC's clinical use post 2000 varies in size, scope, and methodology, but it yields reasonably consistent conclusions. We summarize the results of published surveys here; we omit informal estimates of the prevalence of FC's use in the community (e.g., Rubin & Rubin, 2005).

In an internet survey of 552 parents (80% of whom were American) recruited through colleagues and postings of autism societies, Green et al. (2006) found that 9.8% reported that their children were currently using FC; 10.2% said that they had used FC in the past, although the time period of previous use was not specified.

Harrington, Patrick, Edwards, and Brand (2006) administered a paper-and-pencil survey to 62 attendees at a conference for parents of children with autism held in 2002 in Westchester, New York. In contrast to the results of Green et al. (2006), only one parent (1.6%) reported that his or her child was using FC.

In a web-based survey of 185 teachers across the state of Georgia who reported on treatment use for children with ASD, Hess, Morrier, Hefflin, and Ivey (2008) found that 6.7% reported that FC was being administered in their classrooms. FC use was limited to elementary school children.

Lock, Graf, and Bitar (2008) recruited 1141 (out of total of 7500 email surveys sent) parents, caregivers, and mental professionals from various autism treatment and advocacy organizations in Texas. The researchers asked participants about their familiarity and experience with a broad array of autism interventions. Twenty-six percent of parents/caregivers (n = 605)

and 44% (n = 436) of professionals, respectively, reported having heard of FC. On a 1 to 5 scale (1 = strongly disagree, 5 = strongly agree), parents/caregivers were slightly positive (M = 3.49) regarding FC's helpfulness, whereas professionals were slightly negative (M = 2.60). Although the latter number is perhaps somewhat reassuring, it suggests that many mental health professionals perceived FC as useful. Nevertheless, because participants were not required to have direct experience with FC, it is unclear how many of those who administered FC (or whose children received FC) found it helpful.

Schreck and Mazur (2008) adopted a different approach to examining the popularity of FC. Using an internet survey, they asked 469 board-certified applied behavior analysts regarding their use of, and attitudes toward, various interventions for autism. Schreck and Mazur found that 6.4% reported using FC; the same percentage said they found FC to be effective. Perhaps surprisingly, 5.1% of behavior analysts stated that they believed that FC was supported by research. Among participants who did not report using FC, 32.6% said that they knew of other mental health professionals who were using it. In addition, behavior analysts who had been practicing for fewer than 5 years were significantly more likely to report using FC than those who had been practicing for more than five years. This finding raises the possibility that less experienced behavior analysts are less aware of the discrediting of FC, and hence more likely to administer it (see Cook Myers, Miltenberger, & Suda, 1998, for similar findings).

Pignotti and Thyer (2009) conducted an internet survey of novel and unsupported therapies among 400 licensed clinical social workers across 39 U.S. states. Because only 9% of the sample reported working primarily with preschool or school-aged children, this study probably underestimates the frequency of FC use among social workers in general. Even so, 1.9% of the sample reported using FC currently; another 0.5% reported having used FC in the past, but discontinuing it. These percentages are not comparable with those of the other surveys reported here, however, because they focus on the percentage use of FC among practitioners rather than among children.

Hall and Riccio (2012) used an internet-based platform to collect data from 452 parents and other caregivers of children with an ASD. The authors recruited participants from approximately 800 support groups for parents and caregivers of children with autism and asked them to report on the frequency of use of various interventions with their child. Six percent of participants said that their child had used FC in the past, and 6.4% said that their child was currently using FC.

To our knowledge, only one recent survey has examined students' knowledge regarding FC's effectiveness. Price (2013) distributed a questionnaire concerning autism's characteristics, diagnosis, etiology, and intervention, both in email and paper-and-pencil form, to 97 students drawn from four universities in Mississippi. Of these students, 74 were undergraduates majoring in communication disorders, and 23 were graduate students in speech-language pathology. In response to the question, "Research supports the use of facilitated communication with autism" (Price, 2013, p. 75), 100% [*sic*] of undergraduates agreed while 83% of graduate students agreed. It is not known whether participants might have confused FC with other communication-based interventions for autism. Even so, these high percentages raise troubling questions regarding student attitudes toward FC and the current state of education of students concerning FC.

All of the published surveys are based exclusively on American samples. Although survey data outside of the U.S. are lacking, numerous articles suggest that FC has recently acquired (or reacquired) substantial traction in countries outside of the US, particularly Australia, Italy, Germany, and Finland—with some evidence of its implementation in Asia (Bernardi, & Tuzzi, 2011; Bigozzi et al., 2012; Niemi and Kärnä-Lin, 2002; Mazerolle & Legosz, 2012; Oudin, Revel, & Nadel, 2007; Schiavo, Tressoldi, & Martinez, 2005; Sipilä & Määttä, 2011).

In addition, these surveys may have overlooked the use of renamed or altered versions of FC. For example, FC is now often called "supported typing," "progressive kinesthetic feedback" (Giese, 2008), or "written output communication enhancement". In still other cases, FC has transmogrified into superficially different variants. For example, rapid prompting, sometimes called informative pointing (Todd, 2012), is a minor modification of FC that similarly appears to operate by means of the ideomotor effect. This technique was developed by Soma Mukhopadhyay for her son Tito, who was diagnosed with autism, and was introduced to the United States in 2001 (Tostanoski, Lang, Raulston, Carnett, & Davis, 2014). In rapid prompting, as opposed to traditional FC, the facilitator subtly moves the keyboard or letter board as the individual types without apparent physical assistance (Raulston et al., 2013). There is presently no scientific support for this method (Tostanoski et al., 2014).

Media and internet coverage

Several surveys have examined media or popular coverage of FC over time. Wick and Smith (2009) used the Lexis/Nexis database to examine the frequency of mentions of FC and other controversial treatments for autism (e.g., chelation therapy, sensory–motor integration therapy, secretin) in the popular media from 1991 to 2005. They coded whether the mention was positive, negative, or neutral toward FC. Wick and Smith found that popular media citations for FC declined precipitously in the mid-1990s, corresponding to its discrediting in the scientific community (Jacobson et al., 1995). Nevertheless, FC experienced a dramatic uptick in citations beginning in 2005, perhaps corresponding to the release and repeated showings of the film *Autism is a World* on CNN (see "Facilitated Communication in the Entertainment World"). Thirty-nine percent of mentions of FC in the popular literature were positive; 29% were negative. Many controversial autism treatments did not display the same temporal pattern; for example, sensory–motor integration therapy displayed a sharp decline in media citations from 2004 to 2005. Hence, these results for FC are unlikely to reflect a generalized upsurge in coverage for all autism treatments in the mid-2000s.

Additional evidence indicates that FC continues to receive mentions on widely accessed autism websites. Stephenson, Carter, and Kemp (2012) examined eight websites of US and international autism and ASD societies (e.g., Autism Society of America, National Autism Association, Autism Society Canada) and found that four featured information concerning FC. Two of these four sites were coded by independent raters as presenting mostly negative scientific findings for FC; the other two sites did not provide information concerning scientific findings on FC. Nevertheless, three of the four sites were rated as providing mixed or neutral anecdotal reports concerning FC's effectiveness; one was rated as providing negative anecdotal reports.

Schreck, Russell, and Vargas (2013) examined the media's use of both applied

behavior analysis (ABA), which is empirically supported for the treatment of autism, and a number of scientifically unsupported interventions, including FC, between 2000 and 2010. They identified 112 mentions of ABA and 55 mentions of FC in the five most widely circulated U.S. newspapers (e.g., *New York Times*, *USA Today*) and U.S. magazines (e.g., *Time*, *People*). FC accounted for 10% of all mentions of autism treatments across the decade, and the ratio of positive statements to negative statements for FC was two to one.

For the purpose of this article, we conducted our own analysis of the trends in media and print coverage of FC between 1980 and 2013 using three databases: Lexis (All English News plus All World Publications), Google, and Google Scholar using the search terms "facilitated communication" and "autism." For comparison, we conducted a search for the most extensively empirically supported technique for autism—namely, ABA—using the search terms "applied behavior analysis" and "autism." The results of these graphs are displayed in Figure 1.

As can be seen, for FC, the Lexis database revealed a bump in the popularity of stories on FC in the early to mid-1990s (corresponding to FC's emergence in the US and other countries), a decline soon after (corresponding to FC's discrediting in the scientific community), and an increase in around 2005 (broadly corroborating the findings of Wick & Smith, 2009). The frequencies of mentions of FC have been variable since then, although they have returned to close to their levels in the mid-1990s. Google Scholar citations spiked in the mid-1990s, but declined after that. In contrast, Google citations continued to increase after the mid-1990s, perhaps reflecting a disjunction between popular and academic coverage of FC. Both Google and Google Scholar citations have increased fairly steadily since 2000, especially 2005. The graph for ABA tells a different story. Google Scholar citations have soared since the mid-1990s and continued to jump post 2000, reflecting an upsurge in academic publications. In contrast, Google citations have stagnated since 2000 (although Lexis citations have increased somewhat).

Overall, these results suggest that FC's coverage in the popular press has increased over the past decade and that its coverage in scholarly articles has also increased modestly. In contrast, ABA's coverage in the popular press has largely stagnated or increased modestly, whereas its coverage in scholarly articles has increased dramatically.

Summary of Survey Data

The survey data on FC are limited in several respects. They are not based on representative samples of practitioners or parents, and they originate from differing geographical regions. Moreover, because comparable survey data are not available prior to 2000, it is not known whether FC use has increased, decreased, or stabilized since the early 1990s, when FC first appeared on the scene in the US. A survey by Cook Myers et al. (1998) of 177 staff members at seven developmental disabilities agencies in North Dakota had found that 18% of practitioners were using FC. This finding raises the possibility that FC use has declined since the mid-to-late 1990s, but direct comparisons with more recent surveys are not possible. Still, more recent survey data consistently indicate that FC use remains widespread in many quarters, with a range of current use post 2000 ranging from 1.6% to 9.8% of children with autism. The findings of Price (2013) further suggest that many students who specialize in communication disorders believe FC to be effective for autism. Data on media and internet coverage of FC

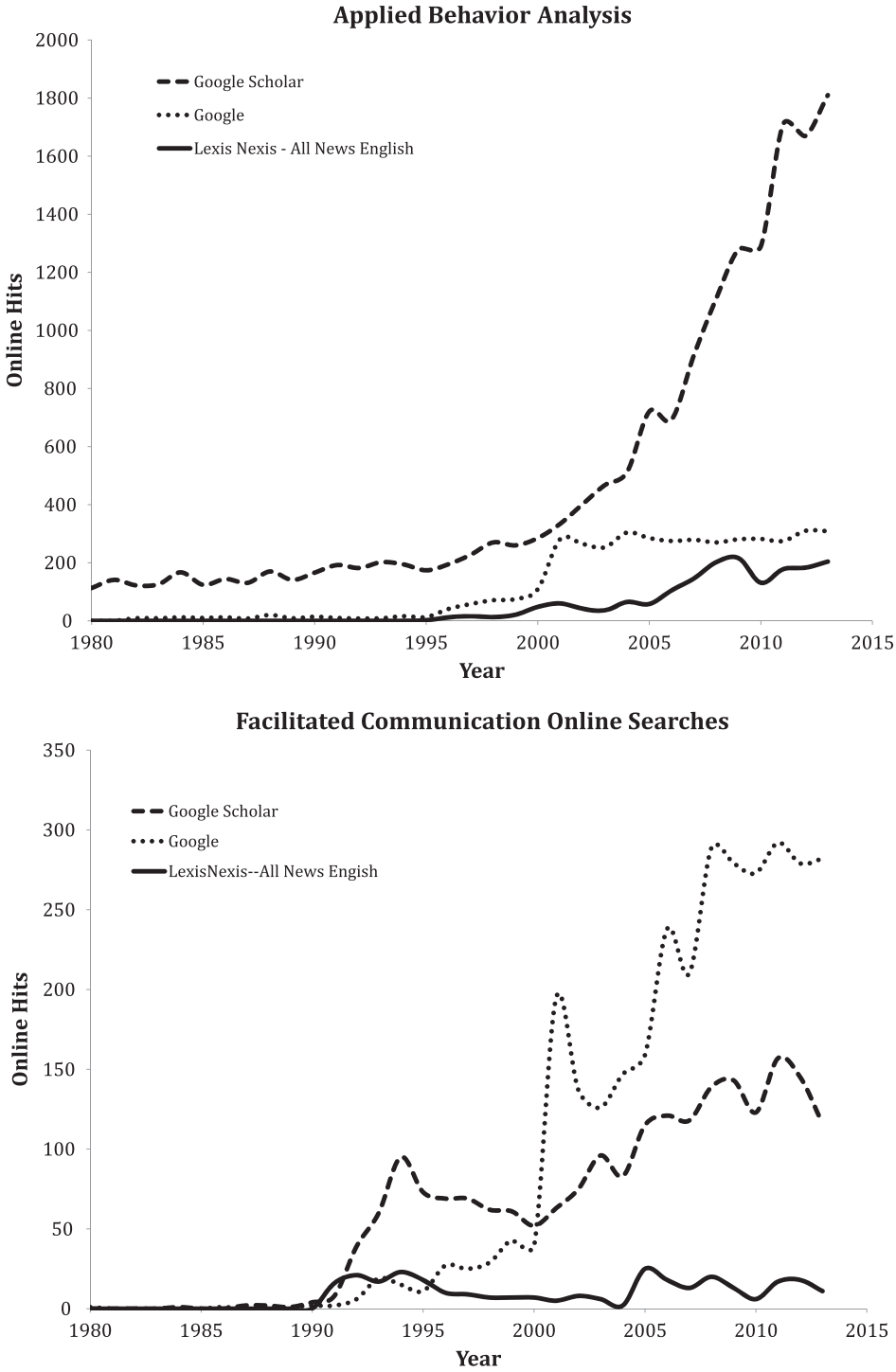

Figure 1. Trends in media and print coverage for applied behavior analysis and facilitated communication (1980 to 2013).

indicate that citations to FC peaked in the mid-2000s, and that such citations remained at a relatively high rate until the present time. Perhaps most worrisome, much of the media coverage of FC post 2000 was positive in tone (Wick & Smith, 2009), although this coverage may be less positive on autism websites (Stephenson et al., 2012). Still, the fact that some of the coverage on these websites is mixed suggests that parents who consult such websites can and will readily find some supportive information regarding FC.

THE RESURRECTION OF FACILITATED COMMUNICATION

The results of these surveys suggest that FC has persisted in the clinical community and in popular consciousness following its discrediting in the scientific community in the mid-to-late 1990s. As we demonstrate, however, FC's resilience is equally evident in its continued visibility in academic and other institutional settings, popular books, peer-reviewed publications, the internet, the news and entertainment, media, and other venues.

Facilitated communication's comeback in academic and professional institutions

One of the most clear-cut manifestations of FC's persistence is its continued presence in academic settings. For example, FC has figured prominently in a select few, but highly popular, textbooks (see Mostert, 2002, for examples). A number of colleges and universities now support, if not endorse, FC. The most obvious example is the enduring success of Douglas Biklen's Facilitated Communication Institute at Syracuse University, which was renamed the Institute on Communication and Inclusion (ICI) in 2010. The reason for the name change is unclear, but may stem from the awareness that FC is regarded as illegitimate in the scientific community (indeed, the bad press associated with the Italian term "Comuniazione Facilitata" inspired FC advocates there to abandon it in favor of the aforementioned "WOCE"; Cadei, n.d.). The Syracuse University ICI sponsors and supports numerous activities, including an FC art group, support groups for caregivers of individuals with autism, training seminars, and summer conferences. The ICI also provides sponsorship to groups that promote FC. Rigorous controlled research on FC's effectiveness, however, is not listed among the ICI's activities.

The ICI has been accorded legitimacy in numerous quarters. In 2008, the ICI received a $500,000 grant from the John P. Hussman Foundation to pursue research, training, and dissemination of FC (Hagen, 2012), with nearly a third of the award allocated "to support the training of family members in the use of augmentative and alternative communication strategies" (Syracuse University Giving, 2008). The ICI is a long-time recipient of grants and support from the Nancy Lurie Marks Foundation, including funding for at least one faculty line. Moreover, a commentary article in the peer-reviewed journal *Frontiers in Integrative Neuroscience* (Berger, 2013) listed the ICI, along with (a) "Bodyspeaks," a group that promotes FC and similar communication techniques and (b) Whitter Area Parents' Association for the Developmentally Handicapped (WAPADH), a California-based organization that endorses FC, as three of six recommended resources for individuals seeking information about autism. A fourth recommended group, Helping Autism Through Learning and Outreach (HALO), disseminates rapid prompting, a technique that, as noted earlier, appears to be a minor variant of FC (Tostanoski et al., 2014). The author of the article concluded,

"I encourage persons with autism, and the parents of such persons, to explore the therapeutic opportunities offered by these, and what I expect will be growing number of similar, organizations" (Berger, 2013, p. 2).

Solidifying the impression of FC's scientific legitimacy was Douglas Biklen's appointment, in 2005, as Dean of Education at Syracuse University (Rimland, 2005), a position that he held until his retirement from the Syracuse University administration in January of 2014. Biklen was appointed by Syracuse University Chancellor Nancy Cantor, herself a prominent psychologist (e.g., Cantor & Mischel, 1977). In announcing Biklen's appointment as Dean, Syracuse University Provost and Vice Chancellor Deborah Freund, wrote that:

> This ability to appoint Doug Biklen to the deanship of the School of Education is an exquisite opportunity. Doug brings international renown for his scholarship, and his passion for the school is truly inspiring. Under his leadership, the possibilities for the school will be limitless. (BAAM Behavior News Archives, 2005)

Cantor was aware of Biklen's legacy and the issues surrounding FC. In a speech in 2007, she portrayed the FC story largely as a triumph of real-world experience over controlled data:

> While the controversy about facilitated communication in the research literature in psychology and education never seems to tire, the compelling testimony to its power is written and rewritten in the stories of autistic individuals . . . whose lives it has turned around—and freed. (Cantor, 2007) (http://www.syr.edu/chancellor/speeches/ImaginingAmericaAnnualConferenceRemarks090707.pdf)

Of course, Syracuse University may well have had what it believed to be legitimate reasons for Biklen's appointment, especially given his extensive leadership background in inclusive education and demonstrated ability to attract external funding. At the same time, it is plausible that this appointment contributed to the perception of FC as helpful to individuals with developmental disabilities.

Further cementing FC's reputation was Douglas Biklen's 2011 award from the United Nation's Educational, Scientific and Cultural Organization (UNESCO)/Emir Jaber al-Ahmad al-Jaber al-Sabah Prize to Promote Quality Education for Persons with Intellectual Disabilities, a prize bestowed by the Kuwaiti government. The UNESCO website announced the award by noting that "Over the past 40 years, his [Biklen's] work has inspired researchers and given hope to many families of persons with disabilities from around the world" (UNESCO Media Services, 2012), but offered no indications of FC's negative standing in the scientific community. Similarly, a recent 18-minute-long video celebrating Biklen's life's work did not mention the uncorroborated sexual abuse allegations associated with FC (Suschoolofed, 2014) (http://www.youtube.com/watch?v=Sci4qn79hlk) One speaker in the video compared Biklen's stature to that of the Beatles.

Biklen has not been alone in his academic recognition. For example, in 2002, Donald Cardinal, another of FC's earliest advocates, was appointed Dean of the College of Educational Studies at Chapman University in Orange, California. Mary Falvey is Dean of the College of Education at California State University, Los Angeles. Her eponymous award, the Mary Falvey Outstanding Young Person Award, has been given at least twice to FC users, Sue Rubin in 1988 and Peyton Goddard in 2004. After proclaiming that FC is not only genuine, but demonstrates that children with autism are psychic (Haskew & Donnellan, 1993), Anne Donnellan (Emeritus, University of Wisconsin) became Director of the Autism Program at the

University of San Diego and was appointed to the Panel of Professional Advisors of the Autism Society.

Recently and currently active academicians who have explicitly endorsed the efficacy of FC and closely allied methods, such as rapid prompting, can be found on the faculties of numerous other institutions in the US and abroad, including Zachary Rossetti (Boston University), Alicia Broderick (Columbia University), Ralph Saverese (Grinnell College), Patricia Edwards (Ashland University), Missy Morton (University of Canterbury, New Zealand), Andrew Grayson and Anne Emerson (Nottingham Trent University), Patricia Block (State University of New York at Stony Brook), Christi Kasa (University of Colorado at Colorado Springs), Christopher Kliewer (University of Northern Iowa), Sandra McClennen (Emeritus, Eastern Michigan University), Eija Kärnä-Lin (University of Joensuu, Finland), and Margaret Bauman (Harvard University). To be clear, the number of individuals on this list should not be taken to imply that there is broad academic support for FC, as they represent only a tiny fraction of all faculty members across major colleges and universities. At the same time, the fact that a prolific set of individuals is affiliated with otherwise reputable institutions may contribute to the illusion of greater legitimacy for FC than is warranted.

Other academic institutions have included FC in their conferences, curricula, disability access, and outreach efforts. In 2012, Indiana State University's School of Education "Sycamore Days" education conference featured a facilitated keynote address attributed to Matthew Hobson, an individual diagnosed with autism, whose typing was at times guided by two individuals (Hobson & Hobson, 2010). In 2014, the University of Northern Iowa hosted a two-day summer institute ("Inclusion and Communication for All") highlighting the use of FC and allied technologies (University of Northern Iowa, 2014). The University of New Hampshire's Institute on Disability has supported FC since the early 1990s and routinely offers training workshops in FC (http://www.iod.unh.edu/projects/fc_skill_builders/about_FC.aspx). The most recent instance, scheduled for October 16, 2014, was conducted by long-time FC advocate Pascal Cheng and FC newcomer, Lisa Bauhan—through whose biography we learn of a grant from the Crotched Mountain organization "to provide ST [supported typing] training throughout New Hampshire" (http://iod.unh.edu/Services/eventdetail/14-07-28/Introductory_Training_for_Supported_Typing.aspx; http://www.crotchedmountain.org/Programs-and-Services/ATECH-Services/Supported-Typing/). Institutions in which facilitated students have been enrolled and reportedly received degrees include Syracuse University, Whittier College (California), LeMoyne College (Pennsylvania), George Mason University (Virginia), Pennsylvania State University, Indiana University–Purdue University, Indianapolis (Indiana), Cuyamaca College (California), and the University of Denver.

Perhaps the pinnacle of FC's success in academia, however, was attained in July 2011, when the Massachusetts Institute of Technology (MIT) Media Lab hosted a conference on FC, with Douglas Biklen and Rosemary Crossley as invited speakers. The program did not feature any speakers who could have challenged the science or ethics of FC. In addition to talks, the conference featured training workshops on "Getting Started with FC," "Typing for Social Interaction," and "Two Handed Typing," among other topics. Although it is likely that many disabilities services offices do not entertain FC as an accommodation option, Lakes Region Community College in New Hampshire appears to be the only higher

education institution in the US with a published policy prohibiting the use of FC in the classroom (Lakes Region Community College. (n.d.). Disabilities Services, http://www.lrcc.edu/student-resources/student-handbook/disabilities-services).

High-profile organizations outside of academia have also played an increasing role in supporting FC. In 2009, the Dan Marino Foundation and the Autistic Self-Advocacy Network (ASAN) featured FC in their "No Myths" public service announcement about autism, but hid the facilitator off-screen (Todd, 2012). In 2012, the Doug Flutie Jr. Autism Foundation, founded by former NFL (National Football League) quarterback Doug Flutie (who has a son with autism), donated $70,000 to 11 schools and organizations to support their use and development of I-Pad technologies for FC (2013 Allison Keller iPad Program Recipients. (n.d.). http://www.flutiefoundation.org/programsgrants/2013-allison-keller-ipad-program-recipients/index.html).

In arguably the most impressive institutional organizational endorsement of FC, the U.S. Department of Justice hired FC advocate Nora Baladerian in 2007 to produce a manual and DVD on forensic interviewing of people with cognitive disabilities. There, FC was depicted as a legitimate means of extracting information from individuals with developmental disabilities, with no hint of the serious problems associated with the technique (Holder, Robinson, & Frost, 2009). One passage in the U.S. government manual provides a case example in which the forensic interviewer "uses what's called "facilitated communication", and I have an interpreter here that's gonna (*sic*) be working with him to answer questions on the typer." The manual continues: "She's basically providing resistive support to his hand, so when you ask him the question, then he will type what the answer is, and it's—the device has a voice feedback, so you'll hear what his answer is" (Holder et al., 2009, p. 48). The manual recommends Douglas Biklen and "Facilitated Communication (FC) Interpreters" at Syracuse University as experts and resource persons for learning how to communicate with intellectually disabled individuals (p. 39). Baladerian, who received a formal letter of congratulations for her efforts in 2008 from APA Executive Officer Norman Anderson, has been quoted as claiming that sexual abuse of people with developmental disabilities is universal (Haskew & Donnellan, 1993).

Facilitated communication in print and online

The new millennium has born witness to a parade of popular books touting the benefits of FC and its variants, such as rapid prompting (Howlin, 2006). Several were purportedly authored by individuals with autism using FC. Among them are *Now You Know Me Think More: A Journey With Autism Using Facilitated Communication Techniques* (Hundal & Lukey, 2003), *Sharing Our Wisdom: A Collection of Presentations by People Within the Autism Spectrum* (Gillingham & McClellan, 2003), *I'm So Glad You Found Me In Here* (Hobson & Hobson, 2010), *Autism: Sensory-Movement Differences and Diversity* (Leary & Donnellan, 2012), *Developing Communication for Autism Using Rapid Prompting Method: Guide for Effective Language* (Mukhopadhyay, 2013), and *I Might Be You: An Exploration of Autism and Connection* (Rentenbach & Prislovsky, 2013). An edited book, *Politics of Occupation-Centered Practice: Reflections on Occupational Engagement Across Cultures* (Pollard & Sakelllariou, 2012) contained a chapter (Block, Shuttleworth, Pratt, Block, & Rammler, 2012) describing the story of two adults with autism who fell in love in 2009 while using FC and became engaged

in 2010. The chapter even broaches the issue of "facilitated sex," in which sexual intercourse between two individuals with autism is facilitated by an assistant.

FC has also increasingly acquired mainstream status in some academic journals, including those in neuroscience, disabilities, and the humanities. For example, in the new millennium, articles supportive of FC have appeared in such peer-reviewed journals as *Brain and Language*, *Topics in Language Disorders*, *Focus on Autism & Other Developmental Disabilities, Intellectual and Developmental Disabilities* (see Mostert, 2010), *Disabilities Studies Quarterly*, and, as we have noted, *Frontiers in Integrative Neuroscience*. The *Journal of Autism and Developmental Disorders* recently featured a laudatory review of a book, *Carly's Voice*: *Breaking Through Autism* (Fleischmann, 2012), which champions the use of FC (VanBergeijk, 2014). Over two dozen articles and chapters that endorse FC as a valid intervention have appeared in academic outlets since 2005, at least 15 of them peer-reviewed.[3]

[3]These articles include Ashby (2011); Ashby and Causton-Theoharis (2009, 2011); Bernardi and Tuzzi (2011); Bigozzi et al. (2012); Biklen (2005, 2007); Biklen and Burke (2006); Biklen and Kliewer (2006); Block, Shuttleworth, Pratt, Block, and Rammler (2012); Broderick (2009); Broderick and Kasa-Hendrickson (2006); Causton-Theoharis, Ashby, and Cozier (2009); Emerson and Dearden (2013); Grayson, Emerson, Howard-Jones, and O'Neil (2012); Kasa-Hendricksen (2006); Kasa-Hendrickson, Broderick, and Hanson (2009); Kasnitz and Block (2012); Kliewer et al. (2005); Mirenda (2008); Rossetti, Ashby, Arndt, Chadwick, and Kasahara (2008); Orlievsky and Cukier (2013); Robledo and Donnellan (2008); Rubin and Rubin (2005); Savarese and Zunshine (2014); Sipilä and Määttä (2011); Sipilä, Uusiautti, and Määttä (2013); Stubblefield (2011); and Wilson, de Jonge, deSouza, and Carlson, (2014).

Perhaps the most impassioned defense of FC in the peer-reviewed literature appeared in an article by Stubblefield (2011) in *Disabilities Studies Quarterly* entitled "Sound and Fury: When Opposition to Facilitated Communication Functions as Hate Speech." Invoking the metaphors of pornographers exploiting women and Ku Klux Klan members burning a cross on the lawn on an African-American's house, the author contended that criticisms of FC and of FC advocates can result in a "silencing of those people targeted by the hate speech" (http://dsq-sds.org/article/view/1729/1777). Critics of FC were denied the opportunity to the respond to her article by the editor of the journal, who replied that rebuttals were not within the journal guidelines (Brenda Bruggeman, personal communication with J.T.T., November 4 & 27, 2011).

FC has also found its way onto innumerable internet sites. One story, appearing on the *Huffington Post* in 2012, featured Jacob Artson, a nonverbal 17-year-old Los Angeles boy diagnosed with autism. Informing readers that "a miracle happened" when Jacob discovered FC shortly before his seventh birthday, the article described his post-FC transformation:

> Perhaps what is most remarkable about Jacob's ability to express himself through typing is how eloquent, thoughtful and intelligent he is. He sent an email to *HuffPost* explaining what it was like for him before he could communicate. "Before I was introduced to typing, I had retreated into anxiety, fear and despair. I read everything around me from books to TV credits to the newspaper on the kitchen table but I had no one to share my ideas with so I just retreated into my own imaginary world." (Miles, 2012)

According to the article, Jacob gives speeches about his FC experiences in New York City and Washington DC. He is

completing high school, and will soon be attending college with his facilitator. In 2013, the *Huffington Post* published an uncritical review of a book, written at least partly with the aid of FC, by a nonspeaking women with autism (Rentenbach, 2013). The *Huffington Post* has also featured supportive coverage of rapid prompting (e.g., Luce, 2013, 2014; Sicile-Kira, 2011).

We also make note of the online "autismcollege.com," on which rapid prompting and FC advocate Chantal Sicile-Kira advertises her speaking services. This site lists among its "Autism College Visiting Professors" fellow FC and rapid prompting supporters prominent autism author and Colorado State University Professor of Animal Sciences Temple Grandin, STAR (Supported Typing & Autism Resources), founder Nancy Brady, long-time FC advocate Darlene Hanson, and Board Certified Behavior Analyst Cathy Pratt, Director of the Indiana Resource Center for Autism at the Indiana Institute—which still lists FC as an effective communication intervention (Indiana Institute on Disability and Community. http://www.iidc.indiana.edu/?pageId=510).

Facilitated communication in the entertainment world

Perhaps even more influential in resurrecting FC in the eyes of the general public has been its promotion in several widely distributed films. In 2004, Academy-Award-winning director Gerardine Wurzburg directed and produced *Autism is a World*, which was coproduced by Douglas Biklen and the Cable News Network (CNN). This film was nominated for the 2005 Academy Awards in the category of Best Documentary Short Subject. *Autism is a World* chronicles the life of Sue Rubin, a young woman diagnosed with autism who learned to communicate with the aid of FC. The film tells Rubin's story in her own FC-generated words through the vehicle of narration by actress Julianna Margulies. Rubin's words impart a poignant tale: She was initially assumed to have an estimated IQ of 29, but FC purportedly revealed her IQ to be 133 (it is unclear what standardized test was administered given that none is normed for use with FC). The film presents a mixed and often confusing picture. On multiple occasions, it depicts Rubin engaging in palilalia (repetition of meaningless phrases), playing obsessively with water and spoons, and paying minimal attention to caregivers asking her important questions about her future. In sharp contrast, in other scenes, it shows Rubin attending Whittier College (with the help of her facilitator), where she majored in Latin American history, and giving eloquent facilitated speeches regarding her experiences with autism. In 2006, *Autism is a World* was replayed several times on CNN, where it was introduced without criticism by network medical correspondent Dr. Sanjay Gupta. In particular, CNN did not mention that Rubin was accompanied in all scenes by a facilitator who either guided her arm during typing or subtly moved the keyboard as she typed.

Wurzberg followed up the commercial success of *Autism is a World* with the 2010 documentary, *Wretches and Jabberers*: *And Other Stories from the Road*, also coproduced by Douglas Biklen and sponsored by the Autism Society. The Autism Society promoted and shared in the screening profits of *Wretches and Jabberers* through AMC Theaters (Glensky, 2011; Todd, 2012). *Wretches and Jabberers* tells the moving story of two middle-aged men with autism who use FC, Larry Bissonnette and Tracy Thresher, who travel to several countries to dispel people's misconceptions about the disorder (in 2005, Biklen had coproduced a documentary about Bissonnette

entitled *My Classic Life as an Artist*: *A Portrait of Larry Bissonnette*). Media reaction to the film was largely positive. *Newsweek* magazine ran a laudatory review entitled "Autism Finds Its Voice," which acknowledged the controversy regarding FC, but noted that the film "suggests that all people have something to say, and their messages may surprise us" (Yabroff, 2011). The *Wall Street Journal* referred to it as an "ingenious documentary" about two individuals "who meet other adults and teenagers who are affected yet not hampered by their disability" (Pirnia, 2011). The *New York Times*, however, was more circumspect in its praise: "The film is maddeningly vague about how the two men made their initial breakthroughs, but it certainly is proof that even those who are written off as children can find a voice" (Genzlinger, 2011).

The predominantly upbeat reviews notwithstanding, *Wretches and Jabberers* raises far more questions than it answers. In most scenes, viewers see Mr. Bissonnette and Mr. Thresher typing with the aid of facilitators who are stabilizing their arm movements, holding their shoulders, or cupping their elbows. In a few cases, they apparently type without looking at the computer screen, a feat that has been demonstrated to be essentially impossible even for extremely experienced typists (Wombles, 2011). In several other instances, they seem to type independently, but these clips are so fleeting and narrowly focused on their hands that viewers cannot evaluate their authenticity with confidence. Nor are viewers informed anything about their ability to type independently prior to receiving FC. The film also neglects to explain why Bissonnette typically requires a facilitator to steady his arm and hand movements while typing given that he can paint detailed images independently (Rinn, 2011). The third author of this article (J.T.T.) has seen Thresher on two occasions in 2005 and 2008, and interacted directly with Bissonnette, including having lunch with him without his facilitator, never once witnessing him either type or communicate independently in a cognitively sophisticated manner. In contrast, Thresher can speak and can read what is produced for him by his facilitator's intervention, raising questions concerning why he requires FC to communicate.

Most recently, FC has been featured in the documentary *I Want to Say*: *The Story of Hope and Technology*, promoted by the organization *Autism Speaks,* which premiered at the Cannes Film Festival in 2012. *I Want to Say*, which includes supportive quotations by Temple Grandin, tells the story of how FC transformed the lives of several children with autism at the Hope Technology School in Palo Alto, California. According to the film's website, it describes how "touch technology can empower those with autism to communicate with their families after years of silence and even tell their parents they love them for the first time" (Hacking autism. *I want to say*. http://www.autismspeaks.org/hacking-autism/i-want-to-say). One variant of FC used at the Hope Technology School involves guiding the child's hand with a stick. FC makes cameo appearances in other recent films, including the 2007 HBO Documentary *Autism: The Musical* (Rudy, 2014) and the 2014 film *Holding in the Storm*: *My Life with Autism*, a fictional drama about an adult with autism who "finds his voice" in part by using FC (Holding in the storm: My life with autism. http://holdinginthestorm.blogspot.ca/). In addition, rapid prompting was featured extensively—and uncritically—in a 2009 documentary entitled *A Mother's Courage*: *Talking Back to Autism*, narrated by actress Kate Winslet (Ericsdotzir & Fridriksson, 2009; see Tostanoski et al., 2014).

As illustrated by CNN's promotion of *Autism is a World*, much of the television coverage of this technique in the new millennium has been short on skeptical scrutiny. For example, on October 2, 2013, on his widely watched program, *The Daily Show*, comedian and host Jon Stewart endorsed a book, *The Reason I Jump*, purportedly written by Naoki Higashida, a 13-year-old Japanese boy with autism and translated by David Mitchell, who was Stewart's guest on the show (Higashida also makes cameo appearances in *Wretches and Jabberers*). Stewart called it "One of the most remarkable books I've ever read. It's truly moving, eye-opening, incredibly vivid" (Deutsch, 2013; see Whittemore, 2014, for similar praise). Nevertheless, in his interview with Stewart, Mitchell did not disclose the fact that Nigashada appears to have used FC, at least in the early phases of his writing: "on that first day when my mom supported my writing hand in hers, I began to acquire a new way of interacting with others" (Higashida & Mitchell, 2013, p. 6). The book asserts that Higashida has since learned to type independently using a computer and letter board (assisted by a "helper" who transcribes his communications), but these claims are difficult to evaluate without videotaped footage, which is unavailable as of this writing. Moreover, there is at present no scientific documentation of Higashida's achievements.

In 2010, Carly Wahlin, a 24-year-old individual with Rett syndrome (a severe neurodevelopmental condition almost exclusively afflicting females), released a CD of poetry set to classical music that was composed using FC. Entitled "In My Voice," the music was composed on a keyboard one note at a time over the course of a year with the assistance of Wahlin's music therapist (McAfee, 2010).

The curious case of Rom Houben

FC's high-water mark of newspaper and television coverage post-2000 occurred in November 2009, when the story of Rom Houben, a 46-year-old Belgian man, made front-page news around the globe. Houben had been tragically injured in a serious car accident 23 years earlier and was presumed by his physicians to be in a persistent vegetative state. Nevertheless, following a functional magnetic resonance imaging scan that appeared to reveal unexpected levels of activity in Houben's brain, eminent neurologist Stephen Laureys of the University of Liege declared that he was actually conscious, but trapped inside of a nonfunctioning body.

Scores of news organizations, including CNN, Fox News, MSNBC, and BBC, announced even more remarkable news: With the aid of an assistant, Linda Wouters, who held his arm while typing, Houben was now able to communicate using a keyboard (Hagen, 2012; Lilienfeld 2009). "I screamed, but there was nothing to hear," typed Houben. "I'll never forget the day that they discovered me," he wrote of the moment when his neurologists recognized that he had been misdiagnosed. "It was my second birth" (Connolly, 2009). The media reported that Houben now speaks four languages and is planning to author a book about his story.

The media coverage of Houben's newfound communication abilities was essentially unanimous in its absence of critical scrutiny. Particularly striking was the media's virtually wholesale failure to mention FC, despite the fact that the widely broadcast footage unambiguously depicted Houben communicating by means of FC (e.g., (Larawbar.com, 2009) http://www.youtube.com/watch?v=h9x9VDdc6do). For example, in a story carried by *Fox News'*

Web Site, *Sky News* wrote that "An engineering student thought to be in a coma for 23 years was actually conscious the whole time, it has emerged." *The Guardian* trumpeted the Houben story with the headline, "Trapped in his own body for 23 years—the coma victim who screamed unheard" (Connolly, 2009). CNN's Campbell Brown informed viewers that:

> For 23 years, a Belgian man lay trapped inside his own body before a medical breakthrough helped set him free. Doctors said he couldn't think, he couldn't reason or communicate. And they were wrong. Inside, he was screaming, but no one could hear. ((Brown, 2009) http://www.edition.cnn.com/TRANSCRIPTS/0911/23/ec.01.html)

Laureys initially refused to conduct a systematic test of Houben's communication capacities, responding to a fellow neurologist that "He [Houben] has gone from being ignored for many years and considered vegetative to being recognized [*sic*] as conscious. And now he is again being treated as if 'it is impossible, he cannot be a cognitive being.' Should I respond to that? I don't want to" (Novella, 2009). Bioethicist Arthur Caplan (2009) of the University of Pennsylvania raised some of the earliest doubts, at least in the U.S. media. As questions mounted, *Der Spiegel* finally reported that Houben was unable to pass a simple message-passing test, failing to type the identity of any of the 15 items presented to him (Dworschak, 2010). On February 19, 2010, the *Associated Press* ran a story entitled "Belgian Coma Patient Can't Communicate After All" ((Logghe, 2010) http://usatoday30.usatoday.com/news/health/2010-02-19-belgium-coma_N.htm), and several news organizations, including ABC and BBC, inconspicuously retracted their claims regarding Houben (Hagen, 2012).

The Wendrow tragedy: Déjà vu all over again

Perhaps most the most vexing manifestation of the apparent rehabilitation of FC in the clinical community has been the reemergence of erroneous sexual abuse allegations toward parents, several of which have yet to come to trial. One case in particular has received substantial media attention, including a five-day front page exposé in the *Detroit Free Press* (see Brasier & Wisely, 2011), a full hour feature on ABC's 20/20, and an extended feature on the popular Japanese television magazine, "Amazing Stories" (Gomystyn, 2012).

In 2007, a Michigan man, Julian Wendrow, was accused of years of sexual abuse (including rape) against his 14-year-old daughter with autism, Aislinn, exclusively on the basis of FC allegations generated along with a facilitator at her school (Alexander, 2009; Heinzen et al., in press; Todd, 2012). Julian's wife, Thal (aka "Tali"), was accused of knowing about the abuse and of participating in it, but not intervening. Additional charges eventually emerged, including witness tampering against Julian and Tali. Those familiar with FC's history will note striking parallels between the Wendrows' story and what happened in 1992 to several other families, including the Storches in the New York and the Wheatons in southern Maine (Boynton, 2012; Palfreman, 1993). Had those involved been attending to this history, the Wendrows' situation could have been resolved as was the Wheatons'—namely, with a double-blind test to demonstrate the source of the authorship of the communications.

Instead, the Michigan Department of Social Services immediately removed Aislinn and her brother Ian from their home and

placed them in protective custody. Sandra McClennen, the former Eastern Michigan University psychologist who introduced the family to FC, recommended to police that they question the girl with a new, naïve facilitator—a method as likely to create more testimony against the family as to resolve the situation (see Green, 1994; Todd, 2012). Julian was imprisoned for 80 days, over 70 of them in solitary confinement (although his incarceration was due technically to contempt of court; he and Tali were accused through FC of plotting to escape justice with the aid of a nonexistent South African relative). Tali was imprisoned for 5 days and was forced to wear a large electronic tether upon her release on bond. Police and prosecutors vigorously pursued charges against the Wendrows despite a physical examination of Aislinn that revealed no evidence of sexual abuse, including repeated intercourse, that Aislinn ostensibly suffered. They also did so despite evidence that verifiably correct responses to straightforward questions occurred only when Aislinn's facilitators knew the answers. In contrast, when they did not know the answers, such as the name of Aislinn's dog or the fact the family was Jewish, Aislinn's FC responses were nonsensical, consisting largely of strings of meaningless letters and numbers or of irrelevant answers.

The Wendrows were finally cleared in March of 2008, two months after Aislinn failed a series of simple message-passing tests in the courtroom. The Prosecutor's Office, however, seemed unswayed by the scientific evidence against FC and by Aislinn's demonstrated lack of communication ability. It maintained that the charges were dropped because Aislinn informed them, via FC, that she would not testify against her parents.[4] In November, 2014, Gigi Jordan, a New York City pharmaceutical executive, was found guilty of manslaughter for killing her 8 year-old son with autism, Jude, whom she injected with a lethal cocktail of medications. Jordan's defense team claimed that Jude, while using a Blackberry device, had informed his mother via FC that his biological father (and Gigi Jordan's ex-husband) had sexually and physically abused him. The defense further argued that Jordan killed Jude to spare him from further abuse. The prosecution maintained that there was no physical evidence of either sexual or physical abuse. As of this writing, the defense indicates that it plans to appeal the verdict (Sanchez & Remizowski, 2014).

[4]4A recent tragic case also involves allegations of sexual abuse reported obtained using FC.

THE PERSISTENCE OF FACILITATED COMMUNICATION: IMPLICATIONS FOR ACADEMICIANS AND CLINICIANS

> One of the saddest lessons of history is this: If we've been bamboozled long enough, we tend to reject any evidence of the bamboozle. We're no longer interested in finding out the truth. The bamboozle has captured us. (Sagan, 1995, p. 241)

Although FC was thoroughly discredited by controlled research by the mid-to-late 1990s, a convergence of evidence from multiple sources, including surveys of use, endorsement by academic and professional institutions, and coverage in the popular media, demonstrates that the FC meme has proven surprisingly resilient to scientific disconfirmation (see also Hagen, 2012). As conceptualized by Dawkins (1989), a meme is a unit of cultural transmission akin to a gene. Like many other memes, FC has survived in part by adopting new names (e.g., supported typing, assisted typing) or by mutating into new

variants (e.g., rapid prompting, informative pointing) in response to environmental changes (Gabora, 1996), such as adverse publicity. Indeed, the propensity of ineffective interventions to undergo only superficial rather than substantive changes in response to negative evidence is a frequent hallmark of pseudoscientific techniques, most of which lack the self-correcting property of scientific techniques (Finn et al., 2005; Lilienfeld et al., 2014).

The persistence of FC, especially when considered against the backdrop of the persistence of other unsupported mental health interventions, such as DARE programs, recovered memory techniques, and energy therapies, raises several troubling questions for the science of communication disorders and psychology, as well as the dissemination of this science to practitioners and the public. In particular, FC's endurance and apparent comeback bear implications for the spread of unsupported interventions for autism, as well as communication and psychological disorders more broadly.

Autism as a fad magnet

As many authors (e.g., Herbert, Sharp, & Gaudiano, 2002; Metz, Mulick, & Butter, 2005; Offit, 2008; Vyse, 2005) have observed, autism has long been a "magnet" for fad treatments. One review yielded a partial list of over 50 unsupported or weakly supported interventions for autism (Smith, 2008). Moreover, surveys suggest that most parents of children with an ASD seek out between 4 and 7 interventions at any given time (Green et al., 2006; Schreck, 2014). Among the treatments that have been attempted with little or no success are gluten- and casein-free diets, probiotics, antifungal interventions, chelation therapy, magnetic shoe inserts, hyperbaric oxygen treatments, weighted vests, cranio-sacral therapy, neurofeedback, chiropractic methods, antiviral therapies, Son-Rise, Floor-Time, dolphin-assisted therapy, equine-assisted therapy, trampoline therapy, secretin, megavitamins, bleach enemas, sensory–motor integration, vision therapy, famotidine (Pepcid), sheep stem cell injections, extended breast feeding, testosterone and testosterone-reducing drugs, nicotine patch therapy, marijuana therapy, camel milk therapy, rebirthing, hypnotherapy, and orthodox psychoanalysis, among scores of others (Autism Science Foundation, 2014; Metz, Mulick, and Butter, 2005). Clearly, FC is riding the crest of an enormous wave of popularity for fad autism treatments in general. In this respect, we can fully understand its continued use only by situating it within the broader context of other fad interventions for this condition.

There are almost certainly multiple sources underlying the potent allure of fad treatments for autism. Perhaps the most self-evident is the fact that autism is a serious, often profoundly impairing, disorder marked by a chronic course. The severity of the disorder's clinical features, which frequently include profound communication deficits, may engender understandable desperation on the part of parents and other caregivers. Hence, one can hardly blame these individuals for considering FC as an intervention option for their children. At the same time, certain associated features of the disorder, such as aggression, lack of interest in people, and nonverbal communication deficits, frequently wax and wane over brief time periods. As a consequence, caregivers, teachers, and treatment providers may erroneously attribute short-term improvements to ineffective interventions rather than to regression to the mean, maturation, or other nonspecific validity threats (Romancyck et al., 2003).

Fad treatments for autism are almost certainly increasing in popularity

(Jacobson et al., 2005; Schreck, 2014). The reasons for this trend are probably multifaceted as well. Most notably, the prevalence of individuals diagnosed with autism has skyrocketed over the past two decades, although there are ample reasons to doubt whether this increase is attributable to a genuine change in the prevalence of the condition as opposed to a plethora of methodological artifacts, including lowered thresholds for the diagnosis of autism and heightened incentives for school districts to identify children as developmentally disabled (Gernsbacher, Dawson, & Goldsmith, 2005; Lilienfeld & Arkowitz, 2007; Wazana, Bresnahan, & Kline, 2007). For example, the rates of autism diagnoses have soared an estimated 78% over the past six years (Dawson, 2013). Regardless of whether this dramatic escalation is genuine or spurious, perceptions often create reality. As a consequence, the impetus to find an effective intervention for a serious disorder believed by many to be increasing in prevalence has become more pressing.

Further fostering the dissemination of fad autism treatments is the heightened influence and availability of the internet. Mackintoch, Cook Myers, and Goin-Kochel (2006) found that 86% of parents of children with autism had consulted websites for information regarding autism treatments; this percentage has presumably grown in the intervening years. Moreover, the proportion of parents who had consulted journal articles was only about half that number (44%), suggesting that parental treatment decisions may be informed substantially more by web-based information than by information from peer-reviewed sources. Because much of the treatment information on autism websites is variable in quality and frequently neglects to distinguish scientifically supported from unsupported interventions (Stephenson et al., 2011), it is virtually inevitable that parents are routinely encountering substantial amounts of misinformation regarding autism treatment.

The seductive appeal of FC

In addition to the appeal of fad autism treatments more broadly, FC may be especially attractive to parents and practitioners for reasons all of its own. In contrast to other widely used interventions, FC does not purport to "treat" or "remedy" autism's core deficits. Nor does it concede the existence of cognitive deficiencies in autism, viewing them only as "differences." Instead, FC purports to unlock affected individuals' hidden intellectual and linguistic capacities, and it implies that they are mentally intact people trapped within a malfunctioning body (e.g., Biklen, 1990). The emotional draw of this view is understandable, as it offers the promise of forging or unearthing communication with an intellectually typical person.

The existence of autistic savants may lend plausibility to this hypothesis. Savants comprise a small minority of individuals with autism who display astonishing intellective talents (e.g., calendar calculation, extraordinary geographical knowledge, superb musical ability; Miller, 1999). Some FC proponents may assume that savants are merely the "tip of the iceberg" of a huge population of individuals with autism who harbor undiscovered mental abilities (Palfreman, 1993). More broadly, this view accords with "the myth of unrealized potential" (Lilienfeld, Lynn, & Beyerstein, 2010), the pervasive popular psychology belief that lying fallow within each of us is a vast storehouse of unharnessed intellectual capacity. The long debunked but still prevalent claim that virtually all people use only 10% of their brain capacity (Beyerstein, 1999) is merely one instantiation of this misconception. Widespread beliefs

in mind–body dualism—the assumption that an immaterial "mind" exists separately from the brain (Forstmann, Burgmer, & Mussweiler, 2012)—may be another.

Further fueling the popularity of FC may be what one of us (H.C.S.; see Offit, 2008, for a similar discussion) has termed the "savior effect," whereby well-intentioned treatment providers feel an understandable desire to rescue individuals with autism and their parents from a presumed lifetime of despair. In contrast to the hope offered by FC, the research discrediting FC may strike many caregivers as dispiriting and discouraging. As a consequence, such findings may be dismissed largely on emotional grounds. It is all too easy to mistake hard-headedness for hard-heartedness (Meehl, 1973) and to assume that researchers who have subjected FC to rigorous scientific scrutiny have minimal concern for the psychological needs of individuals with autism and their loved ones. Although this isomorphism is perhaps understandable, it confuses genuine hope, which should be pursued vigorously, with false hope, which can engender disastrous consequences. Specifically, it overlooks the serious harms engendered by FC, including opportunity costs (i.e., forsaking potentially effective treatments) and erroneous abuse allegations against innocent individuals (Howlin, 2011).

Furthermore, FC probably appears plausible to some practitioners because of the allure of naïve realism (Ross & Ward, 1996), a term that refers to the belief that we can place uncritical trust in the raw data of our perceptions. Naïve realism, which implies falsely that "seeing is believing," may be one of the key cognitive wellsprings underpinning acceptance of a myriad of unvalidated treatments (Lilienfeld, Ritschel, Lynn, Latzman, & Cautin, 2013). Specifically, naïve realism reassures us that our subjective experiences regarding treatment effectiveness should be accorded considerably more weight than data gathered through controlled studies. As comedian Chico Marx quipped, "Who you gonna believe, me or your own eyes?" (Poundstone, 2010). For example, in a content analysis of reasons for the continued popularity of DARE programs, Birkeland, Murphy-Graham, and Weiss (2005) cited police officers' and school officials' belief that "personal experience is more convincing than scientific evidence" (p. 253) as a key explanation. Similarly, in the case of FC, many practitioners may place considerably more trust in the subjectively compelling evidence of their clinical observations than in the often dry and impersonal results of scientific research. Indeed, the ideomotor effect strikes many of those unfamiliar with it as profoundly counterintuitive. By definition, facilitators' control over the individual's limb movements or the keyboard is external to their conscious awareness. Hence, facilitators tend to attribute causation to factors outside of their control—namely, the autistic individuals' actions (Burgess et al., 1998; Wegner, 2003).

The distinctive characteristics of autism may afford FC a further air of plausibility. In contrast to most conditions tied to a heightened risk of intellectual disability (e.g., Down syndrome, Turner syndrome), autism is rarely associated with obvious dysmorphic facial features. Instead, individuals with autism frequently appear physically normal (Herbert et al., 2003). As a consequence, practitioners may be lured into the belief that an intellectually intact person lurks beneath the normal exterior, merely waiting to be discovered by FC.

More broadly, a host of sociological and psychological factors have probably conspired to contribute to FC's persistence. As

Best (2006) observed, fads are especially difficult to dislodge once they have become institutionalized. For example, despite the striking absence of evidence for their efficacy, DARE programs have endured in part because they have become firmly ensconced in thousands of school districts (Birkeland, Murphy-Graham, & Weiss, 2005). Similarly, once entrenched in school districts, FC may be difficult to unseat without firm, vocal, and steadfast opposition (Best, 2006).

At a psychological level, the usual suspects of confirmation bias, belief perseverance, and cognitive dissonance (Lilienfeld, Ammirati, & Landfield, 2009) almost surely play supporting roles in FC's continuing popularity. Confirmation bias, which leads us to seek evidence consistent with our beliefs and to neglect or selectively reinterpret evidence that does not (Nickerson, 1998), may predispose individuals to fixate on the small number of apparent successful trials of FC (e.g., Kliewer et al., 2005; but see Mostert, 2001, for methodological critiques of these positive findings) and to neglect the substantially larger body of contrary scientific evidence (Lilienfeld, 2005; 2010). Confirmation bias regarding a specific belief, such as FC's effectiveness, can in turn engender belief perseverance (Anderson et al., 1980), creating a psychological "tunnel vision" in which the belief persists despite persuasive negative evidence. Furthermore, once individuals find themselves committed to a stance, cognitive dissonance and allied processes (e.g., effort justification; Axsom & Cooper, 1985), as well as face-saving (Tedeschi, Schlenker, & Bonoma, 1971), may make it difficult for them to admit errors to themselves or others (Tavris & Aronson, 2007).

In rare cases, courageous individuals can overcome the force-field of these powerful psychological obstacles (Todd, 2012). One example is Jaynce Boynton, who was the facilitator in the 1992 case of Betsy Wheaton, a 16-year-old girl with autism who generated sexual abuse allegations against her father and brother using FC. In a recent article, Boynton (2012) described her painful journey from FC believer to FC disbeliever. After Wheaton failed a series of simple message-passing tasks, Boynton was initially in disbelief. Accordingly, she engaged in a series of post hoc rationalizations for the failed tests: "Almost immediately, I started rationalizing away the truth. Though it was not true, I went away from the testing telling myself that the situation had been hostile, the evaluator had been hostile, everyone had turned against me" (Boynton, 2012, p. 9). Eventually, however, she came to realize that she had been deceived by FC and persuaded Wheaton's school to stop using the procedure. This transformation was not easy for her, and she appreciates why: "I understand how difficult it may be for some facilitators to change their belief system. There is a lot at stake: people's careers, reputations, connections with their family member or client" (Boynton, 2012, p. 10).

Lessons and implications for the science of communication and psychological disorders

The story of FC's persistence imparts crucial lessons for academicians and professionals, both those in communication disorders and those in psychology. First, this story is a sobering reminder that the third route for fads, in which techniques that are discredited by systematic research largely go underground and persist in sizeable sectors of the clinical and educational communities, may be more prevalent than commonly believed. Hence, researchers and practitioners should not presume that once a technique has been refuted by scientific research, it will necessarily vanish

from the clinical scene. Second, the FC story affords an illustration of the perils of academic complacency. Many researchers may believe that it is not their responsibility to combat the spread of unsubstantiated interventions, and that this task is better left to others (Bunge, 1984). Yet, research suggests that once fads become institutionalized, they will often persist unless they meet with persistent opposition (Best, 2006). Hence, the failure of researchers to speak out against discredited techniques may inadvertently empower these techniques.

RECOMMENDATIONS

In light of these considerations, how can the fields of academic and professional communication disorders and psychology combat the spread of FC and other fad interventions for autism? Although the tale of FC's persistence does not lend itself to easy answers, we can offer several tangible proposals in light of educational research. Nevertheless, because FC has proven to be a surprisingly resilient meme, we suspect that repeated and concerted efforts along multiple fronts will be necessary to erode its popularity. Many of these recommendations, we believe, bear important implications for more sweeping efforts to combat the spread of educational, psychological, and psychiatric fads in general.

In particular, we advocate for more sustained educational efforts to provide long-term "immunization" against questionable claims regarding FC and other fad techniques for autism. Clearly, these efforts need to be extended well beyond graduate students to educators, school assistants, and other would-be facilitators. Indeed, there is abundant evidence of a substantial science–practice gap in the domains of school psychology and special education, as surveys suggest that many practitioners in educational settings rely more on personal experiences than on refereed journal articles to inform their choice of interventions (Bramlett, Murphy, Johnson, Wallingsford, & Hall, 2002; Lilienfeld, Ammirati, & David, 2012). As Kavale and Mostert (2004) noted, the field of special education may be especially susceptible to fads given the seriousness of the psychological deficits involved: "The overwhelming desire to 'help' special education students has often resulted in an uncritical wish to believe that the latest untested intervention is the long-sought answer" (p. 31–43). If so, the need for proactive education in scientific thinking may be especially pressing for professionals in the special disabilities field.

As one of us has argued elsewhere (Lilienfeld, 2010), the education of all mental health, communication disorders, and education professionals should include a thorough understanding of the strengths and weaknesses of clinical judgment and prediction, biases and errors (e.g., confirmation bias, illusory correlation) that can predispose individuals to erroneous clinical inferences, and of debiasing techniques that may be helpful in minimizing the risk of these specious conclusions (see also Gambrill, 2006). At the same time, because efforts to debias individuals against erroneous beliefs have often met with limited success in controlled studies (Lilienfeld et al., 2009), these techniques are unlikely to be sufficient for combatting beliefs in FC. Moreover, although training students in evidence-based techniques is undeniably important, it is only a partial remedy. An exclusive focus on evidence-based methods risks creating competent technicians rather than scientific thinkers who can critically evaluate assertions regarding new and untested techniques. Along with instruction in such methods, students must

come to appreciate the manifold causes of spurious therapeutic effectiveness (CSTEs; Lilienfeld et al., 2014), including the ideomotor effect, all of which can predispose clients, therapists, and observers alike to conclude that treatments are beneficial when they are not. Moreover, a better understanding of CSTEs, which also include placebo effects, regression to the mean, and multiple treatment interference, can help students to understand how even highly intelligent people can conclude that ineffective interventions of many stripes are effective.

Demonstrating to students how readily they can be fooled by bogus interventions may also be an effective debiasing technique. For example, teaching students about the long history of failed treatments in psychiatry and psychology, such as psychoanalysis for psychotic disorders and prefrontal lobotomy, should be a required component of the training of all professionals in communication disorders and mental health (Grove & Meehl, 1996). In particular, it may be helpful to explain to students how and why many bright and well-educated individuals were fooled by these interventions. On a more concrete level, recent research demonstrates that exposing students to a first-hand demonstration of water dowsing—a classic example of the ideomotor effect—and then explaining to them how they were misled by it, leads them to become more skeptical of FC (Lawson & Crane, 2014). Such work suggests that a "refutational approach" (Kowalski & Taylor, 2009), which activates beliefs in the ideomotor effect before debunking it, may be helpful in debiasing students against unwarranted claims regarding FC.

Furthermore, the education of future communication disorders, education, and mental health professionals, including would-be facilitators, must focus on inculcating professional responsibilities regarding the acquisition and application of scientific knowledge and scientific thinking skills. As O'Donohue and Henderson (1999) observed, all practitioners possess "epistemic duties,"—that is, ethical responsibilities to seek and obtain accurate knowledge. Among these duties is the need "to behave in an explicitly critical manner, particularly in a self-critical manner. That is, one acknowledges that one's beliefs may be in error and one seeks to rigorously criticize one's beliefs to see if they are in error and thus in need of revision" (p. 17). These duties, we would add, also include the ability to critically evaluate evidence derived from both primary research studies and systematic synopses of the research literature (see Schlosser & Sigafoos, 2009, for a discussion of navigating the AAC literature). Educators must help students to appreciate that these responsibilities are every bit as crucial as the ethical requirements with which mental health professionals are more familiar (e.g., avoiding sexual relationships with clients, client confidentiality, mandated reporting of abuse). Indeed, one potential explanation for Schreck and Mazur's (2008) finding, described earlier, that 6.4% of behavior analysts use FC, is that scientific thinking is not routinely incorporated into the training of behavior analysts (Moore & Shook, 2001; Shook, 2005).

Certainly, we can absolve families and loved ones for accepting FC and many other fads in their often desperate struggles to find solutions for their disabled offspring (see Maurice, 1994, for an illustration). That said, the reality of a family's quest for clinical answers only amplifies the responsibility of communication disorder and mental health professionals to steadfastly serve as the first line of defense against pseudoscience by thoughtfully and temperately dissuading vulnerable parents from the perils of such practices.

Scientists who wish to counteract the persistence of FC and other questionable methods, such as recovered memory techniques, must also acquaint themselves with the growing corpus of research on effective and ineffective methods of dispelling misconceptions. This evidence suggests that merely informing people that a belief is false often exerts little or no long-term effect (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012). In fact, repeatedly stating that a claim is incorrect can, paradoxically, generate a "familiarity backfire effect," whereby the claim comes to be accepted as true merely because it has been heard many times. In other cases, especially when a claim is central to individuals' deeply held beliefs, debunking can generate a "worldview backfire effect," whereby attempts to discredit the claim are peremptorily rejected because they are perceived as threatening. In both cases, research evidence indicates that the debunking of erroneous claims must be paired with an alternative, and ideally more compelling, narrative (Lewandowsky et al., 2012).

Hence, when communicating about FC to the general public, researchers, educators, and clinicians must make concerted efforts not merely to debunk this procedure, but to supply a rival narrative that can displace belief in FC. In the case of FC, the choice of this narrative is clear: the success stories of well-established AAC methods and of ABA, both of which are empirically supported for remediating autism and the communicative deficits of this condition (Bolte & Hallmayer, 2011; Mirenda, 2001). For example, systematic reviews demonstrate that AAC techniques are helpful for children with co-occurring ASD and communication deficits (Sigafoos et al., 2014), and meta-analyses suggest that ABA, although far from a cure, yields medium to large positive effects on a variety of deficits in autism, including language, overall cognitive functioning, daily living skills, and social relatedness (Virues-Ortega, 2010). By informing parents and other caregivers that in contrast to FC, which offers false hope, AAC methods and ABA offer genuine hope, scientists may be able to counteract at least some of the understandable emotional appeal of FC. To do so, however, they may also need to combat prevalent misrepresentations of ABA, such as the erroneous belief that this technique frequently incorporates physical punishment or neglects to recognize the uniqueness of individuals (e.g., Morris, 2009; see also Arntsen, Locke, Locke, & Eilertsen, and Lamal, 1995, for survey data). Furthermore, the wholesale failure of FC as an AAC approach should not exclude the use of legitimate, evidence-based AAC approaches (see Sigafoos et al., 2014). Because some AAC techniques, such as those involving the use of picture symbols on keyboards (Mirenda, 2001), may be easily confused with FC by non-specialists, professionals may also need to underscore the differences between FC and well-supported AAC methods to caregivers.

Finally, we urge scientists in the communication disorders, psychological, and educational arenas to become more vocal in their opposition to fad interventions of all kinds. Just as practitioners possess epistemic duties to acquire and apply knowledge and scientific thinking, researchers with relevant expertise possess ethical duties to speak out against techniques, such as FC and suggestive techniques for memory recovery, that have the potential to cause serious harm (O'Donohue & Henderson, 1999). Such efforts should also include consultation with autism societies to provide scientifically accurate information on websites and other promotional materials. As Dawes (2005) observed,

hortatory guidelines—those that exhort professionals what to do—are necessary but not sufficient for ensuring adequate clinical practice. They must be paired with minatory guidelines—those that instruct professionals what *not* to do. Only by playing an active role in the public dissemination of hortatory and minatory guidelines regarding the treatment of autism can scientists expect to stem the tide of FC and, we can confidently forecast, a spate of other unsupported interventions for both autism and other conditions.

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