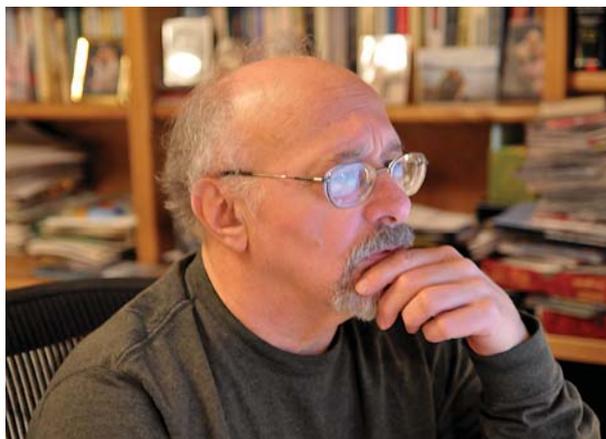


George Halasz in conversation with Allan Schore Northridge, CA, Thursday 24 December 2009



Allan Schore (photo by George Halasz)

INTRODUCTION

Over the years, I have met with Professor Allan Schore and Dr Judy Schore on a number of occasions, at their home in LA and on his visits to Australia. In this recorded conversation, December 2009 at their home, our wide ranging conversation explored the background and context for Allan's decisions along his distinguished career path. Professor Allan Schore, regarded as one of the pioneer theoretician 'scientist of the brain', traces the intimate relationship between his personal and professional life highlighting how his lived experiences' shaped his radical theory of regulation and dysregulation of human emotions. He described formative links including how the profound impact of his engineer father's complex work with thermostats imprinted to shape young and curious Allan's mind to integrate rather than isolate specialist knowledge.

After his formal training in clinical neuropsychology, his dual interests in clinical and scientific matters led to an intense period of a decade self-directed leaning. Funded by what he light-heartedly calls his wife's 'Judy Schore scholarship' provided his autodidact nature the intellectual freedom to pursue, master and integrate the interdisciplinary fields of psychoanalysis, behavioural and neuro-psychology, psychiatry, neurology and paediatrics, ultimately into basic biology and biological chemistry. He integrated these academics streams in the first of his three volume, with homage to Darwin's title, *Affect Regulation and the Origin of the Self. The Neurobiology of Emotional Development* (1994) with some

2500 references. His reputation made on the strength of his 'green book', Allan details the evolving model of his regulation theory culminating last year at the American Psychological Association 2009 Convention, aptly titled, not without a fight, 'The Paradigm Shift: The right brain and the relational unconscious'.

That his 'green book' was written after only one published article is all the more remarkable. But then many events that Allan discusses are remarkable, tracing his contributions to the paradigm shift transitioning in our mental health profession between the 'old' and 'new' paradigm. Allan highlights his close and on-going Australian connections that include Professor Sid Bloch's, past Editor of the ANZJP, invitation to submit to the journal. He fondly recalled asking what he should write on, Sid's answer 'wherever you want to go', to his current research collaboration with Professor Russel Mears.

Allan's profound contributions to our thinking about the nature and development of affect regulations are recognized internationally. After my conversation with Allan I was reminded again of his intense and at times overwhelming sense of urgency that has fuelled his passion and personality, the foundations that characterise his work and life, both intimately shared with Judy and his family.

In part one, (hard copy in Journal) Allan provided the background to his personal and family influences shaping his work.

Halasz We've just finished a very delightful lunch where we started to speak about some of the work that Judy, your wife, and you have been involved in for the best part of how many years?

Schore Since about 1990. The first article was written in 1990 and published in *Psychoanalysis and Contemporary Thought* in 1991. So it's been 20 years.

Halasz Could I start by asking you to reflect on the events that led up to your '91 article – how did you come to this area, which today is at the heart of the paradigm change in modern neurobiology of mind and development?

Schore For openers, let me point out that I'm a clinician-scientist rather than a scientist-clinician. Most of what I've done is theoretical research that directly ties to clinical models, although I'm now also doing experimental clinical research. But the scientist part has been carefully observing the inner worlds of the patients I've seen over the last 40 years.

This integration of the science and the clinical has been there from the start. I was trained in clinical psychology at the University of Pittsburgh, and although the mid-late 1960's was a seminal period of behavioral psychology I felt that psychodynamic approaches were more effective with a wider variety of patients. So from the very beginning of my professional life one trend, a psychoanalytic understanding of patients, has allowed me to understand work with more severely disturbed patients, narcissistic personality disorders and borderline personality disorders. The psychopathological roots of these disorders are early in life, and so the cases allowed me to see up close the later impacts of early relational disturbances.

But the second trend had its origins in my training in clinical neuropsychology that I received in an internship at Lafayette Clinic in Detroit. At the time the Halstead-Reitan and Luria neurodiagnostic batteries were used to anatomically localize neurological deficits. This training hospital had on staff a number of superb psychoanalytic clinicians, a contingent of prominent neurologists and neuropsychologists, a renowned psychophysiologist, and psychiatrists who were studying the biology of schizophrenia. Talk about interdisciplinary! I have strong memories of the exciting and heated staff meetings, when a number of disciplines converged in dialogue about common clinical matters.

This dual interest in science and clinical matters continued when I took a position in the Psychiatry Department at Kaiser Permanente here in southern California. In addition to seeing 30 patients a week, I did numerous neuropsychological evaluations and trained Kaiser's neuropsychologists, and lectured to the pediatrics department. I also set up a private practice in order to work more deeply with long-term patients. In 1980, after working for 10 years, I decided to essentially cut back my clinical hours and start a period of intense study. Leaving Kaiser I thought I'd write something on the limitations of the DSM's concept of "organicity." And so for the next decade along with my ongoing clinical practice I (re-) immersed myself in the world of academic scholarship, returning to not only clinical psychology, but to psychiatry, neurology and paediatrics (the areas which I was already involved) and ultimately into basic biology and biological chemistry.

For 10 years, every week I spent one day roaming the stacks of a California State University library near here. I'd copy large numbers of articles in various fields and then pore over them in my home office. I became extremely interested in the biological and neurological processes that lied at the core of the psychological and psychiatric problems of the patients I was treating.

Halasz What actually triggered your self-directed learning in this direction? This seems a departure from what was a traditional academic course or analytic training course?

Schore Exactly, and I was fully aware of the choice I was making. At that time I had finished my own psychoanalytic psychotherapeutic explorations, and I realised that I wanted to, first of all, follow a self-organising path, as I'm by nature a self-organizing studier. And so I chose a solitary path of independent study, rather than moving towards a psychoanalytic institute or an academic position at UCLA. This fit my learning style, which continually seeks a great deal of novelty. It also fit my value system in which time devoted to scholarship is time well spent. As I continued my studies into a variety of disciplines, I became particularly interested in the points of contact between disciplines. I was most interested with the concepts that lie between fields, so I didn't want a context which would narrow down my wide ranging interests. The gains from my psychotherapy gave me enough confidence to pursue my own interests, wherever my curious mind led

me, and that supplied the energy and motivation that sustained intense study during the entire decade of the 1980's.

Halasz That's quite a courageous move for a young clinician, researcher, academic to take on self-directed learning for around a decade.

Schore I used this early-forming self-directed learning mechanism rather successfully throughout my school years, up to and including getting my PhD in 3 and a half years. And I expanded it even more in my own therapy where I became more acquainted with the inner workings of my mind, and this allowed me to move into the ensuing period of independent study. In the same period the therapeutic explorations of emotional processes in my patients and in myself allowed me to become aware of how primary affect was in the subjectivities of both the patient and the therapist, and the power of a perspective that integrated the psychological and biological realms.

For the 10 years of independent study, unlike the decade of my formal education, there were no pressures of examinations, no need to explain or solve anything, and no need to publish. My mood was extremely positive, and imbued with the joy of learning new information from different fields, and my confidence and intense curiosity increased as I realized I could master a variety of different disciplines than those in which I was trained. And so I spent a number of years in reading journals in cell biology, neurochemistry, neurophysiology, neuroanatomy, etc., especially looking at changes over early developmental periods of an organism's life span.

I had to create a structure that self-organized my time, and an environment that could support my creativity. At the very outset of this independent study period I intuitively chose to return to the piano. When I was a child I dabbled with the piano for a year or two. So in my late 30's, I went back to the piano for a number of reasons. Not just to listen to but to create music, and thereby bring music into my home made ivory tower. I was aware that the music would allow me to understand something in my fingers and not just in my mind. Science, and emotions in particular were not apprehended just through logical understanding. I wanted to be able to visualize what I was beginning to know. Later I realized I needed to move more and more into my right brain, the source of creative processing.

The routine I came up with was to visit the local university library every week. I'd return

with 30-40 xeroxed articles, and then take notes on each in 100 sheet 8 ½ by 11 legal pads. By the end of the decade the pads stacked well over 6 feet high, and they contained long sections of detailed notes on related research common to different fields. Every second or third notebook I noted repeating patterns across fields and began to integrate different research literatures. By this time I was sure that the integration of psychiatry, psychology, and biology could produce powerful theoretical models.

At the end of the decade I intuitively made the decision to end the period of independent study. My plan was to now write a formulation of a psychoneurobiological perspective that related to the clinical phenomena I was observing in my practice. In fact some of the problems that I was ended upon studying, the role of mitochondria and energy production is development across the lifespan, the evolution of methanogenic bacteria and the earliest forms of life, the basic processes of recovery from disease. I hope to return to these areas in the future.

All of this occurred in my late 30's and 40's, a time when I should have been building my practice. In fact I reduced my clinical work to 3 days, allowing the bulk of my time for study. In order to cover the economics my wife and I switched income responsibilities, and she built up her private practice. In a sense I was on a Judy Schore grant for 10 years. In other words the two of us had figured out economically how we could support my research, pay the mortgage, and also raise two children.

There were other advantages to setting up this arrangement. As soon as my daughter was born I cut my work days back to four days to allow more time for fatherhood. As my children got older and Judy and I re-organized our joint responsibilities, it turned out that I became the parent who was home when the kids came back from school. I point this out because all of the science that I've created has not occurred in a laboratory. In a very real sense all of my work has really come out of the home in which I lived and the relationships which I was a part of. And one of the profound changes in me was not only the relationship I shared with Judy, but my becoming a father. This fatherhood was a source of the emotional growth that occurred in me from my relationships with my children, especially when they were infants. From my college days I had always been extremely interested in developmental psychology, and my subjective curiosity also

reflected upon my relationships with my children. And so the science and the data of development, which was occurring before my eyes, was filtered through my own subjectivity. It was myself in intimate relationships that became an important part of the focus of what I was academically researching, rather than the more detached perspective of science as usually practised.

Throughout this period I continued my clinical practice, especially focusing on treating narcissistic personality disorders, a clinical problem that at the time was being freshly addressed in the seminal works of Kohut, Kernberg, and Masterson. These authors were focusing on not oedipal but preoedipal stages of development, and more and more the older oedipally-centered developmental theories were problematic. My own patients were also sources of developmental data, expressed in their disturbed early object relations and their ensuing personality deficits. In other words, the developmental models that emerged from my research could generate hypotheses about preoedipal experiences, the earliest periods of development, including the early development of the unconscious mind. This gave me a chance to test my ideas out on the patients I was seeing. The research-generated ideas had to also work clinically.

Halasz When you say older developmental theories, could you mention which ones and in what way they were problematic?

Schore In the 1980's the work of Mahler and Stern started to incorporate scientific observational techniques into developmental psychoanalytic research. These data complimented the ongoing work of clinicians on early developmental processes (e.g, Kohut on empathy, and Masterson on the role of not paternal but maternal factors in personality psychopathogenesis). The scientific and clinical domains both converged to show that psychoanalytic oedipal theories that focused solely on development of the personality at three- and four-years old, and that narrowed the source of all psychopathogenesis to aggression and sexuality were not useful in understanding the structural deficits of the inner world of these more severely disturbed personality disorders. This was practical information, because at that time we were seeing more and more of these kinds of patients here in Los Angeles.

In addition, psychoanalysis at that time continued its banishment of real-life trauma in

models in psychopathogenesis. Yet patients with developmental disorders clearly reported histories of early trauma. And so both theoretically and practically I realized that ongoing clinical models based on development of the verbal child at three years were much too late, and essentially ignored the critical events of infancy! I therefore started to move back earlier and earlier. That's not to say that certain major psychoanalytic developmentalists had not been working deep in the earliest stages of the unconscious. Certainly Bowlby and Winnicott were talking about the first year of life. And Klein's ideas about projective identification also focused on the very beginnings.

This move back from the verbal to the non-verbal also shifted the emphasis in my thinking from the development of the conscious to the unconscious, and the cognitive to the emotional realms. We are now clearly in a period in which the primacy of affect is well established. But at that time not only psychoanalysis but science downplayed the critical role of affective processes in the human experience. Recall, the 60's, the era of my early career, was the heyday of behavioural psychology. And then of course there was a paradigm shift in the seventies and the eighties into cognitive psychology, followed in the late eighties and the early nineties with the rumblings of a third force, the psychobiological psychology of emotions *per se*.

Now when it came to emotions I found that the kind of work that I was doing with my patients, especially these early disturbed patients, was all about emotion. Their interpersonal deficits were fundamentally deficits in coping with a wide array of emotions. In fact when it came to narcissistic personalities, the keystone affects were not sexuality and aggression or even anxiety, but rather early-forming fear-terror and shame. Incidentally, in the eighties, Judith's clinical research for her PhD was on shame. So I became very interested in early forming shame, which then lead me to the early development of emotions *per se*.

Halasz In that decade of the "Judy Schore fellowship," you're saying that your theoretical work was informed by not only your patients but by Judy's academic and research studies of shame.

Schore Right. At that time, besides Sylvan Tomkins, there was very little work on the highly

visual, nonverbal affect of shame. Much if not all of the focus was on verbally-biased guilt, a later forming emotion. Essentially Judy and I were both moving into the earlier pre-verbal phases and the earlier pre-verbal emotions.

By the end of the 80's it became clear that shame is the hallmark of narcissistic personality disorders, and that working with this affect was essential in the treatment of developmental disorders. So more and more of my work went into the early interpersonal origins of this nonverbal affect. Nothing had been written on this. Clinically the matter of shame turned out to be relevant to not only development but the therapeutic process. In order to be able to work earlier and deeper, one has to be able to have some understanding of one's own shame dynamics. These are highly interpersonal dynamics, and although they begin in infancy they play out nonverbally, beneath the words, in all relationships and in all developmental stages. Interestingly, these insights occurred at the end of the decade, when I intuitively decided to finish my period of self study. It was now time to write, and I knew what this would be about – a model of early emotional development, with a specific focus on the emergence of shame.

Halasz Can you recall the very first paper or article that you wrote in this area?

Schore Yes. Judy and I wrote an article together and it was about shame and gender development. We submitted it to the *Journal of the American Psychoanalytic Association* and they would have none of it.

Halasz So it wasn't accepted for publication?

Schore No. We were not only talking about the primacy of emotion at a time when psychoanalysis had no theory of affect. But in addition we were questioning a cardinal tenet of psychoanalysis – the centrality of oedipal events in development and therapy. However, there was another psychoanalytic journal, one related to JAPA, *Psychoanalysis and Contemporary Thought* (which I think is no longer published). With I a sense of relief I noticed that on its editorial board were people like Bob Emde, Fred Pine, and Erik Erikson, major developmentalists. When I saw their names I knew immediately that this journal would be a good fit. So I wrote my first paper, "Early superego development: the emergence of shame and narcissistic affect regulation in the practicing period" and submitted it to that journal. The paper ended

with neurobiological speculations about the early development of the right hemisphere. It was accepted immediately. As I look back I view it as my first articulation of developmental neuropsychology.

Halasz Now this also sounds like it was the precondition for your first book, *Affect Regulation and the Origin of the Self: the Neurobiology of Emotional Development*. The "origin of self" is a most profound subject to tackle, especially in your first book – how did you conceptualise it?

Schore As I mentioned, one outcome of the preceding period of independent study was the use of an interdisciplinary perspective that integrated biology and psychology. In thinking about development, this linkage allowed me to conceptualise specifically how nature and nurture interact. And by focusing on not early cognition but bodily-based affect, it enabled me to think about how the developing mind and body interact. This theoretical lens looked at not only the development of psychological function but neurobiological structure that mediates these early appearing essential psychobiological processes. Remember at this time the field was plagued with what appeared to be unresolvable dichotomies – biology vs. psychology; nature vs. nurture, brain vs. mind; mind vs. body.

Weaving together different disciplines I was convinced of the power of this model. Each time I applied it to another developmental phenomenon it provided a deeper understanding of the underlying developmental mechanism. And this same mechanism was operating in the unfolding developmental dynamics in the cases I was seeing. Essentially both the science and the clinical were coming together to provide a heuristic model of the evolution of psychic structure and how interpersonal experiences changes psychic structure (for better or worse). So over the period of independent study my confidence in what would become regulation theory was also increased by my clinical experiences. For ten years my expanding curiosity was the main driving force, and it resulted in a confidence in both the capacities of my mind and of the interdisciplinary perspective. Interestingly, we now know that it takes 10,000 hours (about 10 years) of intense study to acquire an intuitive expertise in any skill.

Halasz Your confidence came from within; it may have been centred on your model, but the actual sense of conviction is an interior state.

Do you have any sense from where you actually derived both your curiosity and sense of conviction and confidence?

Schore I had explored the roots of this implicit conviction in my own therapy, where I became more acquainted with the inner workings of my mind. This in turn allowed me to move into the ensuing period of solitary, independent study. In the same period the therapeutic explorations of emotional processes in my patients and in myself allowed me to become aware of how primary affect was in the subjectivities of both the patient and the therapist, and the power of a perspective that incorporated a relational view of the human experience.

I continue to set aside large amounts of time in my daily life for reading and pondering new studies over a broad spectrum of disciplines. In this manner my conscious and unconscious minds are continuously stimulated, challenged and surprised by novel and intrinsically interesting information. My particular response to finding new scientific and clinical data is more than just intellectual. My period of independent study revealed that the process of both objective and subjective learning was a highly emotional one, and that studying subjective and intersubjective emotional processes can not be done without also introspecting into my own self. I became aware of this at moments of insight, at points which I could now more deeply understand something that I couldn't be understood before. There's a significant emotional rush that occurs in that creative moment.

In order to come up with a fresh solution to the problems I was addressing I realized that my right brain implicit learning processes played an even larger role than my familiar left brain approaches. From the outset I decided never to explicitly memorize anything. And then I found that I had to expand my tolerance for the uncertainty of not knowing, to allow my mind to stay open long enough rather than prematurely closing down the exploratory process with what appeared to be a quick solution. In order to foster the creative process I never deliberately attempted to solve anything in particular. Rather, I would just take in large amounts of salient information, with an intuitive bodily-based knack for knowing what is essential information. Ultimately my right brain unconscious mind would recognize patterns, which then my left brain conscious mind would describe verbally. Frequently these

solutions took a visual form. I've been aware for some time that I'm studying right brain processes with right brain and not left brain learning mechanisms.

In the period of independent study and self exploration I found that my creativity expressed itself not in linear analytical intellectual "work" but in nonlinear positively emotionally-charged "play-states" which wander, and are sustained by extended spans of attention that last for long periods of time. Frequently classical music, especially Mozart and Handel are in the background. These creative play states that amplify positive arousal are long enduring moods marked by the positive affects of heightened interest and enjoyment, which at certain moments transform into excitement and joy. The play state also generates thought experiments that can trigger novel solutions. As you know studies show that play facilitates the processing of novel information and thereby improves learning capacity.

My confidence in my ability to wonder, recognize, understand and articulate increased with practice over the 10 years. This confidence was not even shaken by the concerns of my friends, who on the one hand admired me for taking this independent stance and yet on the other hand were worried that this enormous expenditure of time might lead nowhere. As long as I had the internal rewards of the exploratory process and the external support of my inner circle, my family, I was undaunted by their empathic concerns, "Why don't you get somebody to take a look? You may be wrong."

This burgeoning trust in not the rational but the intuitive also allowed me to know when the period of self study was over, when it was time to write, and to test my ideas out in the scientific and clinical worlds. And so by the end of the 80's the internal journey now had to be converted into an external journey, one that would lead me to far away places (including Australia!).

INTRO TO ON-LINE PART TWO

In the following 'on-line' section of my interview, Allan details (-insert if break is at page 11 after '...(including Australia!)' - key influences from his family of origin and) why leaving medical school - the 'bad fit' - allowed him more time to spend with his father, who passed away after this interview in early 2010. Those life-changing impressions

shaped Allan's subsequent story, his 'rich exposure' to the worlds of psychiatry, psychoanalysis and clinical psychology and creative encounters with Henry Krystal, Stanley Greenspan, Jim Grotstein and others as he struggled for scientific recognition. That his model of regulation theory was forged from the convergence of neuroscience and developmental psychology achieved for Allan international recognition. He details the following decade as he consolidated that reputation with his 'blue' and 'red' books. Finally Allan casts his vision on the decade ahead, to the application of the new paradigm within and beyond mental health to social policy and society.

Halasz Now before we explore those far away places, your hand gestures emphasize your voracious curiosity and intellectual appetite. It reminds me we're surrounded here in your study by a dozen piles of journal articles, some two feet high. The articles are colour coded with poster stickers.

I recall that about five years ago when I visited you, I asked for an article on ADHD. "Just a moment", and without missing a beat, you zeroed in on a pile on your desk that reached up to the ceiling, and pulled out two papers separated by about a foot of space. That impression left me to wonder whether your voracious intellectual appetite is complimented by a photographic memory?

Schore My grandfather, an Austrian Jewish immigrant who became an electroengraver and translated chemistry texts from German into English possessed a photographic memory. When I read something I emotionally mark it in space, and later can locate and find a particularly meaningful sentence on an exact page. When I'm reading interesting material I'm in a heightened state of attention, and so it triggers somatic markers and takes on personal relevance and becomes meaningful. My right hippocampus literally is marking novel salient information in space and time. The tabs are visual cues that allow me to return to them when I have to incorporate them into a narrative form. The problem is how to get back to where the material originates. I know where it is and when to get it. Much of this is done on an implicit level. At times this gets complex - in my first book I cited 2500 different references.

I do have a highly visual memory and ultimately when I need to go back in my mind to get something I frequently move my body to the exact spot that I last located it for future

reference. I know physically more than mentally where it is. All of this takes place here in my office, with one desk and my Mac on one side, and another desk that looks out a bay window and on to a pool and garden on the other side. And in between are shelves of books and papers stacked here, there and everywhere. To a visitor it looks like I'm working in chaos. But there's organization in this disorganization. All the information is there to be found in places I've marked emotionally, and much of this goes on at an implicit unconscious level.

The matters of curiosity and creativity have always been interesting questions, and one focus of my mind is on my own self-reflective awareness. Recently I've written about the clinician's creativity being a major factor in effective treatment. I've suggested that as opposed to left brain explicit, rational, analytic, secondary process cognition that breaks down information into separate categories, implicit right brain primary process cognition supports the ability to integrate, to synthesize large amounts of objective and subjective data. By observing my own creative subjectivity I begin to learn how my body would spontaneously and unconsciously react to material that was relevant and important even before my conscious mind. These subjective events were giving me important clues as to how the bodily-based unconscious rapidly operates beneath the words.

Halasz Many people have learnt to accommodate their unconscious but I think you are saying something more here Allan. You actually learned to recognise body messages as well - would examples be a flush or a palpitation, a heartbeat or breathlessness, literally a moment that took your breath away?

Schore Yes. This is the same mechanism by which the overt and covert bodily expressions of the patient are recognized by the therapist. But I'm suggesting that in other types of problem solving we also recognize covert somatic markers in our own bodies, and that these can be tied to images associated with these markers. A number of not only psychotherapists but also scientists and artists have described the essential role of bodily states and images in the creative process. Einstein observed that in pondering abstract mathematical problems he would follow his own body cues, and that the solution came to him in images. I've spoken about the bottom-up process of somatic counter-transference, moments when the patient's

right brain nonverbal unconscious communications trigger the clinician's subcortical somatic markers generated by his autonomic nervous system, which in turn trigger cortical images related to the patient's communication. This mechanism may account for how our "gut feelings" lead to certain clinical hunches, and for "aha" moments of emotional insight. Incidentally I've discussed in some detail the role of right brain processes in clinical creativity in an upcoming article in *Psychoanalytic Dialogues*.

Halasz Now just two points to digress there: one is that briefly before we started our conversation, you mentioned that you actually did a spring cleaning of about 15 years of articles to create a little bit of breathing space in your study. How did you emotionally process this reorganization? With such intense emotional connections to your articles, how did you manage that cleaning process?

Schore You know that's the same process of when we're moving along in life and changing, we're holding onto certain things and letting other things go. At the present point in time, even though the papers had been highly cathected at an earlier point, they may not have the meaning for me. What was novel was incorporated into one or more of my writings. At the point of the spring cleaning I also was pondering where I've been and what I've covered, and where I want to go next, and what pieces of information would be important for the next set of questions. So there's a self monitoring process that implicitly differentiates what I needed to answer earlier questions, and what types of novel information is essential for future emotional-mental explorations. The nonessential information filled eight 70 gallon garbage cans.

When I'm writing, I'm attempting to efficiently communicate complex information to different levels of the reader's mind. But I'm also writing for me. My investigations of the conscious and unconscious realms of subjectivity and intersubjectivity by necessity involve reflections on my own subjectivity. So the writings, attempts to describe right brain intersubjective processes in left brain language, are also communications within my own subjectivity, attempts of my conscious mind to explicitly know what my right mind implicitly knows. There are moments when that language is more precise, and in the best moments, elegant. At later points in time I will go back to the book I wrote 15 years

ago to recall the way I framed a question, to take a look at an earlier attempt to say exactly what I wanted to say in an elemental form, and to review how recent data support the hypotheses I set out.

More so than just describing data, at the most fundamental level I'm attempting to integrate what on the surface appears to be unrelated material. When I succeed it's because both psychological and biological data of mind and body are filtered through a developmental perspective that allows me to create a working model of the subjective emotional inner world as it relates to the external world.

Halasz I'll come to your working model in a moment but just the second point of digression: when did you first realise that you had this powerful curiosity? Was it early in life, or in school? And who alerted you to it, and helped you to cultivate it?

Schore I think a childlike sense of wonder and exploration has been with me from my beginnings. It's the way my mind works, and therefore a central core of my subjectivity. I have a high tolerance for processing large amounts of novel information. I certainly have memories of a strong curiosity and a creative imagination that traces back to my early childhood in Manhattan in the late 1940's. And memories of how both of my parents recognized this and cultivated it, yet at the same time fostered my independent mind.

Halasz This is Barbara and George, to whom you dedicated your first book.

Schore It was purely a wonderful cosmic accident and my good fortune that when I came into this world George and Barbara were my parents. My mother, now deceased, had the combination of being an extremely warm, affiliative, and sociable person yet at the same time she had a very strong force of personality about her. In my early life she was a gifted homemaker, and a warm an accessible mother to me and my younger sister Carolynn. I also have memories of her building up my self-esteem and positive narcissism, yet at other times setting strong limits and curbing my grandiosity. When my sister and I left home for college she did too - she worked with my father and entered the world of business. I believe many of the ideas I have about secure attachments reflect internal images of my deep connection with her.

My father, who died earlier this year at 94, had a very pragmatic mind (he was a chemical engineer who looked for practical applications of science). But he was also a very sensitive and empathic man, with a capacity to form emotional bonds with what on the surface appeared to be very different types of people.

My father, a scientist himself, was a major role model for me in many different ways, including modelling his creativity. During his 50 year career as a chemical engineer he filed numerous patents, beginning at age 25, with US patent for "Process of forming insoluble and adherent nonmetallic films on metals." In his 30's, the period of my childhood, he became an international expert in electroplating, and had numerous patents on copper and gold recovery processes. And in the final stages of his career he moved into another burgeoning area of applied chemical engineering, ion exchange and water pollution, for which he received an award from the Environmental Protection Agency. So I was continually exposed to the mind of an inventor who was translating basic chemical science into practical applications. When I was about 21 years old, between college and ultimately my post-graduate education, I spent about a year working with my father.

Halasz In chemical engineering?

Schore Yes. Actually it gets even more interesting than that. I don't know if you are aware of this. When I left college I went to medical school and after two or three months, I realized that was a bad fit and I left.

Halasz Can you recall what you felt as a bad fit, after two months? It's extraordinary.

Schore I had graduated with a major in psychology and minors in chemistry and English in preparation for going into psychiatry. So I went to medical school. I had always thought it was the path that I was supposed to take. But when I got to medical school in 1964 it just did not fit who I was. As opposed to a context of curiosity and exploration the classes in medical school were contexts of shame and humiliation. The idea that information could be acquired by standing up in front of a large number of people and attempting to press knowledge out of pure rote memory made no sense to me.

After only a couple of months I went into the Dean's office and said, "This is not for me, and I'm leaving." I remember him

looking at me with a puzzled expression, saying "your grades are fine, and you're doing outstanding work in the psychiatry course." And I said, "I can't learn here," and so I left. Now this was during the Vietnam War, and so I had to figure out some way to preserve my future educational studies. So I applied immediately to graduate school in clinical psychology and I was accepted. But for about nine months before school began I went to work with my father.

At this time he had entered into a new professional direction, the application of automation to metal finishing. Working with a brilliant mechanical engineer the two of them designed the first automated assembly electroplating systems, and sold them to amongst others, General Electric, General Motors, and IBM. On one occasion I was in Florida, when he was making a presentation to build an automation system for Honeywell, the manufacturer of thermostats. I have a strong visual memory of him standing before a long table, with seven people in front of him, a mechanical engineer, an electrical engineer, a chemical engineer, a water pollution specialist and a few executives. He was going back and forth answering each of their questions, talking about automation equipment in terms of its impact on all of these different fields.

This was the first time I saw him in the role of a polymath, and I thought, that's the professional mind that I wanted to develop, one that can communicate with different professions. An ability to move between disciplines would become the prototype for my upcoming career. This synthetic, integrative approach was opposed to the then (and still) dominant role of specialisation and an increased narrowing into one's field.

This imprinted autobiographical "Aha moment" later evolved into an interdisciplinary perspective which pervades all my work. Later in my period of the independent study that followed my formal education I found that the people who were the most interesting writers were those open minds who were at the borderlands between fields, the people who were at the interfaces of psychiatry and neuroscience, psychoanalysis and psychology, neuropsychology and personality theory etc. These interesting minds were working at the boundaries of various sciences, and they were also attempting to forge dialogues between them.

Halasz I'd like to come back to that in a moment, but it just occurs to me Allan, as you're describing this scene of Honeywell with your Dad and the six or seven specialists discussing of all things, a thermostat, which is a control device that is centred on regulation.

Schore I never thought of that.

Halasz It's the ultimate regulator isn't it?

Schore Well I have to tell you, that it's a prototypical memory. I have never even thought about the fact that, you know, that's exactly what regulators and regulation is about. Come to think of it, at the heart of all automation systems is a system that monitors and regulates input and output.

Halasz How extraordinary.

Schore But the conscious idea that I would focus my work on regulation and on emotion didn't come to me until after my formal university education. As I mentioned the experiences in my clinical internship gave me a rich exposure to the worlds of neuropsychology, neurology, psychiatry, clinical psychology and psychoanalysis. Following that for 10 years of the 1970s I increased my clinical knowledge by seeing a large number of a wide range of disorders, outpatient and inpatient. And I increased my clinical neuropsychological skills in child, adolescent and adult evaluations, and in lecturing to training staff and interns. Later in this decade I became consciously aware of a strong belief that somewhere in the future I would write something.

Halasz Where did that idea come from?

Schore Many levels of my personality. But I didn't know specifically what I'd write about. That was not important. I assumed that in general it would integrate the two developing trends within me – psychotherapy and neuroscience. Initially I thought the writing would be a critique of DSM-I's segregation of "organic" from psychogenic factors. As unclear as that was I knew for sure I'd have to end my work at Kaiser and alter conditions of my daily life in order to allow for a period of independent study. My private practice clinical work would continue, but now I would commit myself to four days a week at the nearby university library. And I knew that those closest to me were there for support of the path that I had to take.

Halasz To me this is a natural culmination of these many forces shaping your life, borrowing the paradigm from your father, applying the principles of regulation to the interface between

developmental psychology, emotional development, neurobiology, and psychiatry. Let's return to the evolution of your work, and the events that happened when you ended the period of independent study and began to write, as you say the time when your internal journey became an external journey. What happened after your first paper was published?

Schore As soon as the shame paper came out I sent reprints to 40 authors cited in the paper, introducing my work and tying it into theirs. Incidentally many of these were child and adult psychiatrists trained in psychoanalysis, like Henry Krystal, Stanley Greenspan, and Jim Grotstein. And later in that summer, this was about '91, I got back about 35 letters, and I knew that I had connected into a group of peers, clinicians and theoreticians who were also convinced of the centrality of the developmental perspective. The fact that a large number of these authors were child psychiatrists allowed me to forge a link into the field.

In this first article, I began to integrate data from developmental and clinical psychoanalysis with developmental psychology in order to offer a model of the early development of the superego, focusing on the appearance of the affect of shame. But the original submission also contained a large section on how early object relations would also impact the neurobiology of the developing right brain over the first year of life. The editor said to me, "You know you've already got 70 pages here, maybe you want to do something else with the neurobiology." So I decided to expand that section into my next article and submit it to a hard science journal.

The psychoanalytic article succeeded because readers could evaluate evidence that was familiar to them, observations from both psychoanalytic clinicians and researchers about the early developing mind and inner world. But now I needed to find out how neuroscientists would respond, and what types of "evidence" was meaningful for them. I needed their feedback, and so I decided to submit to a peer reviewed neuroscience journal an expanded version of how the interpersonal relationship was affecting the neurobiology of the developing brain. At that time there were parallel but disconnected fields of early development. In psychology the focus was on the development of psychological functions in infancy, and in neuroscience on early brain development. My goal was to create a model

that could forge a convergence between those two literatures.

Towards that end I came to the conclusion that in order to attain this integration I would have to focus not on studies of the adult brain, but on the infant brain. These are two very different systems; the infant brain is not just a miniature of the adult brain. But in addition, at the time the major paradigm in developmental psychology of the first year or two of life was on the development of cognition. It was Piaget's work that was at the center of the field. Indeed there were many attempts by psychodynamic, psychiatric and psychological clinicians to incorporate Piaget's cognitive work into psychotherapeutic models. But the emotional aspects of early development which were at the heart of early forming psychopathologies were overlooked in cognitive developmental psychology. And this was during a time, the early 90's, when science still had not earnestly approached the study of emotion.

Halasz Did you have a visceral reaction or intellectual unease that things weren't fitting in the current model?

Schore Both. And I used both the rational-intellectual approach of science and the perspective of case-oriented data in creating the arguments and evidence set forth in the work. First, the integrative model had to fit the scientific data and second, it had to make sense clinically. Indeed as I was writing the article, I was testing out my hypotheses with my patients, some of whom could reconstruct their early experiences. So now the question was would the hard sciences see clinical data as relevant evidence?

To get this feedback I submitted an article for a neuroscience journal, *Behavioural and Brain Sciences*. It was rejected. Although three of the reviewers accepted it the editor-in-chief rejected it.

Halasz Could I just clarify; the editor-in-chief overrode three independent peer reviewers?

Schore Now that I myself am a reviewer (of about 35 journals), I'm more aware of how editorial forces operate, but I was quite naive at the time. In fact I wasn't aware of the fact that three months before I offered that article there was a severe critique of psychoanalysis in that journal.

On the other hand I did receive some detailed critiques that gave me important informa-

tion. One of the reviewers was a major developmental psychologist who had worked with Sylvania Tomkins, an early pioneer in the study of emotions. In his review he told me to focus less on Mahler and psychoanalysis, and more on Bowlby and attachment theory because attachment theory was more palatable to scientists because of Bowlby's connections to ethology. So I began to shift more towards the attachment studies. And so with this feedback I bypassed any more journals and expanded the model into the Green book, *Affect Regulation and the Origin of the Self*.

But even the sting of the rejection was a learning experience. I realised that the emotional disappointment led me into parts of myself that I would later describe in my work. Instead of rationalizing the pain or avoiding the risk, or even using Judy to help me booster the injury to my self-esteem, I became aware that I just needed to allow myself to deflate and sink deeper into the momentary despair. That became helpful to me.

In other words, I allowed myself to experience not only the accelerating high arousal play states, but also the decelerating narcissistic low arousal deflations. And I found that implicit processes, other than my conscious mind would operate down there, and when they had run their course I'd come back up and continue forward. These experiences highlighted the fact that not only the ability to tolerate positive emotions but also negative emotions was a fundamental aspect of emotional growth and development. I used these experiences in the Green book, where I described emotional development as an expansion of the affect array.

Remember, although I knew I was going to write something in my late 30s, the book finally appeared when I was 50 or 51. As you know physicists write their books in their twenties and thirties, but biologists write them in their forties and fifties. In addition to intellectually preparing for the task, I'm convinced that I had to mature emotionally in order to get a broader perspective of the overarching issues of the human experience.

Halasz Before we go to the Green book, it sounds like you managed to create your own 'peer group' by submitting your article to a create a process that provided your 'reality test' and added confidence that started your next decade to write your book.

Schore Yes. I had written only one article before the Green book. Again, the matter of the confidence in what I was doing was there on more than a conscious level. It was just a matter of what I wanted to say next, and who I wanted to say it to. After the 10 year immersion in reading so many different disciplines I knew how to write in the scientific form. But even more, I was sure not only about how the sciences could be integrated, but about my own abilities to translate and even create the science.

As a scientist I'm extremely careful about the kinds of evidence that I will put together to develop a model. I'm especially confident when I'm putting my money on certain organising principles and theoretical concepts that cut across different sciences. And so when I found the construct of regulation to lie at the core of chemistry, physics, biology, and psychiatry, I knew that any overarching developmental or clinical model could be centered in that.

Halasz So this is where you actually, as you say, put your money on that regulation as being the central construct for your outlook?

Schore Exactly. After the second and third books appeared I began to use the term "Regulation Theory" to describe the body of my work.

Halasz But it was there in the title of your first book. Given this year (2009) especially being the 200th anniversary of Darwin's birth, your book's title to me resonates with his classic, *On The Origin of Species*.

Schore Right. I visualized development to be fundamentally the development of an organism's capacity for self regulation. And it's no coincidence that the title is *Affect Regulation and the Origin of the Self: the Neurobiology of Emotional Development*. I deliberately used the first phrase. First, to reflect Darwin's term "origin of the species," because I could see that I was dealing with an evolutionary mechanism. And second, Darwin had essentially created the science of emotion, and described emotions in terms of facial expressions that served as communications within species. Essentially the book was about the integration of Darwin and Freud.

I sent the book proposal to a psychoanalytic publisher, Analytic Press, who then passed it along to their scientific division, Erlbaum. They immediately accepted the book. But they had severe reservations that the book would

not sell because they felt that the people who were interested in the biology would not be interested in the psychology, the people who were interested in the psychiatry wouldn't care about the neuroscience, and so on. And yet the essence of the book was interdisciplinary. The chapters integrated fields and moved back and forth between the different levels of analysis from the cellular level all the way up to the cultural level and back down.

Halasz And you had the facility for this up and down movement because regulation is the constant recurring theme.

Schore Yes. The concept of the development of regulation allowed me to describe how psychological events impact the maturing structure of the brain and how this more complex structure now supported more complex psychological functions. To this day I enjoy moving from a study at the level of molecular biology and seeing its relevance to something that is at the level of, for example, religious experience or cultural behavior. It's this latitude and depth of an integrative-synthetic perspective that is both intellectually and emotionally pleasing.

Halasz So in your first book, published after just one published article, which by any measure is an extraordinary event, you juxtapose these ideas which becomes your conceptual platform for next decade, leading to the latter two books. The *Affect Regulation* volume is now viewed as a monumental achievement. What happened when it first came out?

Schore My first reaction was one of great relief. I felt that the previous decade had paid off, and that I said exactly what I wanted to say in the book. Indeed not one word was changed by the editor. On the other hand I was dismayed at the price the publisher charging, \$140, an extraordinary price.

Halasz Even by today's standards.

Schore You're not kidding. There was little that could be done about that because there were a lot of expenses in it, as I put in a lot of illustrations. At any rate I got my hands on the book in the spring of 1994, and that summer I wrote 60 letters, sending out many copies at my own expense. But this time in addition to psychiatrists and psychoanalysts, I wrote to neuroanatomists, cell biologists, developmental psychologists etc., literally around the world.

And again at the end of the summer I got back about 50 letters which I still have. I

knew that even before the book had “hit the streets” that it would get a good reception. The format of the book was at the beginning of each chapter I would cite a quotation from a major figure in each field. It was these people that I wrote, and when they responded so quickly I knew that it was a done deal.

Halasz So again you used an immediate feedback process.

Schore Right. And then the very positive journal reviews started to come in. The *British Journal of Psychiatry* called it a “superb integrative work” with a depth and breadth that was “staggering.” That brightened up my day.

Halasz All this as your first book on the back of one published paper and it’s a done deal.

Schore Right.

Halasz How did you feel then?

Schore Well I mean it was, it was elation. I mean...

Halasz Ecstasy?

Schore Yes. But more than that. Although there was a burst of elation, there also was a longer lasting deep sense of satisfaction and achievement that I had accomplished what I set out to do. The book in essence was an argument for the power of integrating the psychological and the biological, the scientific and the clinical. Remember the positive valence of the term “interdisciplinary” was not yet established when the book came out in 1994. But I clearly understood that the work was ahead of its time and groundbreaking, and that it forged new directions for not only clinical practice, but also research.

What I didn’t know was if other people would find the emotional development and the maturation of the infant brain to be as fascinating as I did. And I was also surprised that the book, which was written in the language of science appealed to clinicians. Interestingly the book’s sales continued to gain considerable momentum over the next 10 years. It’s now its 14th or 15th printing, and its Google Scholar citations are pushing towards 2,000, so it’s still being heavily cited.

The book was the generator of a great number of invitations to lecture nationally and internationally, and thereby the ideas were picked up quickly around the world. This allowed me to come into face to face dialogue with a large number of the authors I was citing. But another unexpected bonus of the work was the creation of deep friendships with so

many colleagues of not only like minds, but like hearts (including the one that I’m sitting with right now). Earlier I had referred to the importance of “a peer group.” Shortly after the book came out I was approached by some other UCLA faculty members to join a small group who were studying how neuroscience could be integrated into psychiatry, psychology, and linguistics. And so for the next two years this group focused intently on just one volume - my Green Book. This other members of this seminal peer group - Dan Siegel, Lou Cozzolino, Regina Paley, and John Schumann - were soon to write their own books on interpersonal neuroscience and neuropsychology.

From the beginning the book brought another instant bonus - invitations from a influential journal editors in a number of different fields. These invitations from high level developmental, psychiatric, psychoanalytic, and neuroscience peer-reviewed journals allowed me to bypass submitting articles one by one, and gave me a wide exposure across a number of disciplines. At a later point the *Australian and New Zealand Journal of Psychiatry* was one of these journals. These scientific and clinical journals then allowed me to publish articles on the further development of regulation theory.

The Green book also brought me invitations to be a peer reviewer or on the editorial boards of dozens of journals. This allowed me to influence the direction of both clinical models and experimental research. By the late 90s a growing dialogue was emerging, not only between disciplines, but between clinicians and researchers. Now clinicians were taking in the science, and the science was moving into more relevant clinical research. The ideas were now more freely moving between these two domains.

Halasz And here you are gesturing going back and forth rapidly from left, right, left.

Schore Remember, the book was written in 1994, before what was to become known as “the decade of the brain.” But by the late 90’s there was a tremendous expansion of not only neuroscience, but of an intense interest in interdisciplinary research and models. The book picked up even more sales, and the publisher was delighted to be wrong in their predictions of the readership limitations. Over this time period I continued to develop regulation theory into new problems and directions. These writings were incorporated into the next two books, published in 2003.

One book focused more on the science, the second more on the clinical.

Halasz Let's move to those books, your double publishing, *Affect Regulation and Repair of the Self*, and *Affect Dysregulation and Disorders of the Self* as elegant, almost an aesthetic couplet to the previous *Origin of the Self* - how did you visualise and conceptualise these two books?

Schore As you say it was aesthetically pleasing. Essentially I saw them as a three volume set, where the ideas of the earlier book were thrust forward over the next decade. So the theory of regulation generated new hypotheses that could be tested clinically or experimentally. These books described advances over a decade commencing in the mid 90s, and included a large body of new research, especially neuroimaging research. The growing momentum over the decade of the brain was also accelerated with the changes in the internet that allowed for much more rapid transmission of information.

At the same time due to invitations, I made a quite large number of contacts with other theoreticians, clinicians, and researchers. These numerous dialogues again provided me with feedback systems. One good example - at the end of the nineties we began the UCLA Conferences on attachment and I came in direct contact with the trauma field, Bessel van der Kolk and others. Now I started to re-think the whole problem of trauma and relational trauma. In the 1994 book, when it came to the attachment categories I was mostly talking about the organised insecure, but there was very little work on disorganized-disoriented insecure, "Type D" attachments. And in the early 90s there was also very little work on the parasympathetic nervous system. So by the end of the decade I started to really think about the more disturbed attachments and how they would affect the brain. And what the introduction of attachment would mean to the trauma field *per se*.

Halasz Staying with this point, you mentioned earlier how a colleague advised you to move your theoretical position from Mahler to attachment. At this time, did anyone advise you to move into the Type D and the trauma issues or was this self-directed?

Schore No. This was something I myself deduced. I became aware that in order for attachment models of psychopathology to develop they needed to look more seriously at abuse and neglect. And then there was the matter of the immediate and long-term detrimental effects of infant attachment trauma on brain

development. There had been a little work done on it before. And so as I continued to move back to earlier phases of attachment and very primitive systems. I continued to focus on early appearing subcortical monoaminergic arousal systems. This included not only central but peripheral arousal, and so as more and more studies on the autonomic nervous system appeared I began to formulate a model of Type D neuropathogenesis. I formulated this model in the *Infant Mental Health Journal*, and subsequently in the *Australian and New Zealand Journal*. The latter came directly out of an invitation from child psychiatrists to lecture here in Australia. When I asked Sid Bloch, then editor of the journal, what I should write on, he told me "wherever you want to go."

Halasz That would have suited you fine.

Schore Absolutely. This open space allowed me to expand my trauma model. And I was honoured when the article was chosen the most outstanding article in the journal of the year.

Halasz This is actually a moment I wish to reflect on the quality of your writing. If we talk about vitality-affecting relationships, your writing actually creates in the reader, like myself, a vitality affect. Are you aware that you transmit that immediacy and the urgency in your work?

Schore Oh yes. Early on I decided that when I lecture or write about emotion, I was not going to present either experimental studies or case material in a detached way. Rather I would write science in the present tense, reflecting experience in the subjective moment. I've argued that the right hemisphere is the origin and source of subjective and intersubjective phenomenological data. In other words I didn't want to describe right brain processes in just left brain terms. Rather, I'd attempt to conjure up the images, feelings and the sensations of a bodily-based emotional state *in* an audience. In this manner I'm communicating not only to an audience's left conscious mind, but to their unconscious right lateralized limbic system.

Halasz If I can just illustrate what you've just said with some evidence. In one of your lecture-presentations, I have a vivid image of you describing the experience of dysregulation in a therapy session. You're waving your right and left hands representing the two brains, therapist and patient. You describe their two-way nonverbal communications, gesturing small regular waves in the air passing

back and forth between them. And then you intensely gesticulate large irregular waves as they both enter into an accelerating dysregulated state of traumatic affect. With great excitement, reminiscent of Professor Julius Sumner Miller's style, you pointed up to some apex, and then describe a rapid decelerating collapsed shut down state associated with a disengagement from the environment. And then you exclaim "this is the moment where the patient dissociates and drifts off." That was the moment I learnt what dissociation 'looks like' in therapy.

Schore Wonderful!

Halasz So you provide the visual imagery with your voice and body gesture in almost a choreographic way to impart what right brain vitality and collapse look like.

Schore Yes, its describing right brain nonlinear activities in right brain images functions, and not in linear left brain language.

Halasz Can you tell me more about how your ideas about trauma, a major theme of your second and third books, evolved?

Schore By the end of the nineties I realized I needed to think more specifically about how the dysregulation of trauma, especially early attachment trauma, negatively impacted brain, mind, and body. Fortunately, at the same time I was clinically seeing traumatised patients. In order to help these patients and to understand their trauma from the inside out, I had to be able to intersubjectively resonate right brain-to-right brain with the patient as she entered into dysregulated states. I wanted to learn more about not only the neurophysiological aspects of the trauma but also the subjective aspects of the trauma, the phenomenological aspects of the trauma. This simultaneous tracking of both body and mind would by-pass Descartes' error.

Halasz Related to this one of the radical moments for me was my reading the two words together, "relational trauma". I could not recall ever reading those two words together. Do you recall if it was your original synthesis of two words or did you quote from somewhere?

Schore No, it was me. In 2001 I wrote an article in an issue I edited of *the Infant Mental Health Journal* entitled "The effects of relational trauma right brain development, affect regulation, and infant mental health."

Halasz Do you recall the critical moment in which the phrase arose? Historically relational studies belonged to one domain, trauma the

other and till your words, ne'er the twain should have ever met.

Schore The long disconnect between the two essential concepts was due I think to factors outside and within science. Outside refers to the cultural forces that didn't want to acknowledge trauma inflicted upon children, or trauma in soldiers. But also within science – in psychology it was studied only in a one person psychology, and in biology trauma in an isolated body. The term relational trauma on the other hand evokes the boundaries between fields. The concept of relational trauma bridges psychology and biology; its transmission directly relates to a two person psychology and an interpersonal neurobiology.

Think about psychoanalysis – due to Freud's early formulations trauma was banished from the talking cure for the first century of its existence. It's only been in the last 10-15 years that researchers and clinicians have brought it back into the foreground of ideas of psychopathogenesis. So as I thought about trauma in infancy I wanted to describe more than its psychological effects on the mind, but also its direct detrimental impact on the early developing brain and body. This led me to study the interpersonal neurobiology of the most untoward attachment experiences, abuse and neglect. At the time the dominant model was purely psychological, and it focused on the child witnessing trauma between his parents, not being the direct recipient of trauma from the primary caregiver.

Bowlby proposed that attachment theory can be used to frame specific hypotheses regarding the etiology of psychopathology. He predicted that the theory would be used to frame the early etiologies of a diverse group of psychiatric disorders and the neurophysiological changes that accompany them.

Towards that end, I returned to the core of attachment theory, the integration of psychology and biology, in order to develop the concept of relational trauma and the genesis of severe attachment pathologies. The central question then became, what if the trauma comes from the primary caregiver, the haven of safety *per se*. This opened up a problem fundamental to child psychiatry, the intergenerational transmission of trauma from the mother to the infant, a concept that fit nicely into current relational theories of development. The term relational trauma came to me not so much as an "Aha moment" but as the best semantic description of the phenomena I was studying.

And so in 2001 I began to describe the mechanisms by which the mother in a highly dysregulated, traumatised state would negatively imprint the infant's early developing right brain. In 2002 in the *ANZJP* I expanded regulation theory to tie together relational attachment trauma and the etiology of a predisposition to PTSD. Moving further, in the 2003 red book I expanded the model to the generation of the right brain affect regulating deficits that characterize borderline personality disorder. I'm now pursuing the neurobiology and intergenerational transmission of borderline disorders in electrophysiological research here in Australia with Russell Meares, and in an fMRI study in Canada with Ruth Lanius. But also in my ongoing clinical writings I've offered data to show that the brain-mind-body deficits associated with relational trauma and affect dysregulation have been at the vanguard of challenging earlier Cartesian models in psychiatry and psychology.

Halasz Speaking of psychological models dominant over the last couple of decades where your work is located at this complex 'cutting edge', Thomas Kuhn saw the need for paradigms in science to change when there are enough outliers from the conventional mainstream, for someone to come along and say, "Look, all these outliers are not really outliers, it's our paradigm that is outdated." In 2009 your keynote speech at the American Psychological Association (APA) was titled: *The Paradigm Shift: The Right Brain and the Relational Unconscious*. Up until now you've been speaking about models changing, but now you speak of a paradigm shift. Can you explain how the paradigms have shifted, and how you define the new paradigm?

Schore As you recall in *The Structure of Scientific Revolutions*, Kuhn asserted that paradigms consist of sets of propositions or hypotheses that order an investigator's observations. When a paradigm is overthrown, a new one replaces it.

As I look back over the last four decades, psychology (and also psychiatry) in the 1960's and 70's was essentially observing *behavior*, and therefore it was a period of the dominance of behavioural psychology. The brain, the body, and the unconscious were placed in an opaque "black box" that was not to be opened. In psychoanalysis drives and motivational states were downgraded and relegated to the realm of metapsychology. And so were emotions, which Skinner said were beyond the pale of scientific investigation. Models of psychotherapeutic change revolved

around changing the patient's maladaptive behaviours.

In the 70's and 80's we moved into a period when science was observing not just external behavior, but internal *cognitive* processes (memory, attention etc.). And so we entered into a period of dominance of cognitive psychology, and this too impacted models of psychopathology and psychotherapy. The fundamental principle in this paradigm is to change the patient's maladaptive cognitions, and this is expressed in CBT models. But we're now entering into a period where rapidly forming bodily-based emotions and psychobiological states are dominant. Because the brain's emotional processing is fast acting and occurs beneath levels of awareness, this has also shifted our observations from explicit to implicit phenomena. We now have a theoretical system that can model not only overt behaviours but covert, unconscious states of brain-mind-body. The current paradigm shift has also served as an antidote to previous Cartesian divisions that have plagued psychiatry.

This paradigm shift from behaviour, to cognition, to emotion is allowing an integration between psychology and biology, and thereby forging strong connections between the disciplines of psychology, psychiatry, and neuroscience. Kuhn also stated that a paradigm shift is by definition simultaneously expressed across scientific disciplines. Neuroscience is moving from observations of left brain language-based cognitive processes and voluntary motor functions into studies of right-lateralized emotion processing limbic system and stress regulating HPA axis. This information is being rapidly incorporated into psychiatry. We're now seeing a surge of neurobiological research on the dysregulation of the limbic and autonomic nervous systems in a wide array of psychiatric disorders.

Now it's true that the current surge of research in neuroscience is fueled by advances in the new imaging technologies that can observe brain processing in real time. But that's not enough. We also need a psychoneurobiological theoretical model that can not only generate testable hypotheses but can also conceptualise both brain and bodily research data in a meaningful way. And we need an interpersonal neurobiological perspective that can account for brain-to-brain interactions. I see this trend as a qualitative change in not only in the foci of our research, and the power of our theoretical constructs, but also in our models of psychotherapeutic interventions.

I suggest that we're currently seeing not only a shift across various academic disciplines, but also across clinical disciplines. The study of emotion is now common ground between these two domains. In their letter of invitation the APA asked me to consider not using the term "paradigm shift." Instead they wanted me to use the more palatable and watered-down term, "the emotional revolution." I declined. The APA's invitation was the first time that a member of the Division of Psychoanalysis had been asked to deliver a plenary address. In the plenary I argued that science was now supporting the primacy of affect, including unconscious affect, in the human experience. Integrating psychology, psychoanalysis and neuroscience I described the central role of affect and affect regulation in models of development, psychopathogenesis, and the change process of psychotherapy. It is now clear that psychotherapeutic changes in just cognitions without changes in emotion processing are limited.

In fact, we're now seeing a clash of psychotherapy paradigms, especially with more severe disorders with a history of relational trauma and thereby a deficit in affect regulation. In such cases emotion more than cognition is the focus of the change process. In writing on the change mechanism in the cognitive literature Kazdin (2007) has concluded, "Perhaps we can state more confidently now than before that whatever may be the basis of changes with cognitive therapy, it does not seem to be the cognitions as originally proposed." In cases such as borderline personality disorder more so than interpretation and insight, relational-affective processes between patient and therapist are at the core of the change. In addition research on the therapeutic alliance is supporting a shift from a purely intrapsychic one-person psychology to an intersubjective two-person psychology. In fact I've suggested that the right brain, the "emotional brain," the "social brain" is dominant in psychotherapy.

Halasz Can you talk more about the importance of brain laterality in the paradigm shift?

Schore The laterality of the brain was described at the onset of modern neurology in the 19th century. Even those outside of neuroscience are well aware that Broca and Wernicke located certain (but not all) language functions in the left cerebral hemisphere. Less well known is the seminal work of Hughlings Jackson on the emotion processing functions of the right hemisphere. Modern neuroimaging and the emergent fields of affective and social

neuroscience have revitalized science's interest in the essential and unique functions of the right brain.

In my 1994 book on the development of affect regulation, I deduced that the early maturing right hemisphere had to be centrally involved in the development of attachment over the first two years. After all, many of the critical events in human infancy occur before the onset of left brain language centers. And so I integrated existing data (this was before the decade of the brain) to argue that the control system of attachment was in the orbitofrontal (ventromedial) cortex of the right brain. In 2000 I expanded the model to link up attachment pathology (early abuse and neglect) with alterations of the developmental trajectory of specifically the right brain. For the past two decades I've cited a large body of ongoing research that confirms these hypotheses. Indeed the development of the essential functions of the right brain over the life span has been a central theme of my work on development, psychopathogenesis, and psychotherapy.

In my APA plenary I argued that the paradigm shift from cognition to emotion is paralleled by a shift from the left hemisphere to the right hemisphere. We can no longer think of "the brain" as two halves of a single entity. Rather these two systems process different types of information in very different ways. A large body of data now indicates that the right and left human brain hemispheres differ in macrostructure, ultrastructure, physiology, chemistry, and control of behavior. Indeed, the left hemisphere of the vertebrate brain is specialized for the control of well-established patterns of behavior under ordinary and familiar circumstances. In contrast, the right hemisphere is the primary seat of emotional arousal.

There is now agreement that verbal, conscious, rational and serial information processing takes place in the left hemisphere, while unconscious, nonverbal and emotional information processing takes place in the right. Integrating this work into modern neuropsychology, I've asserted that the right brain is the biological substrate of the human unconscious. In my ongoing work I'm continually incorporating ongoing studies of the right brain into my developmental and clinical models.

In a recent remarkable book *The Master and His Emissary* Iain McGilchrist, a Maudsley

trained psychiatrist concludes, "The difference between the brain's hemisphere is a profound one. It's not just a matter of this or that function being located in a specific area. The hemispheres create coherent utterly different and often incombatale versions of the world with competing priorities and values." He notes, "The left hemisphere is detail-oriented, prefers mechanisms to living things and is inclined to self-interest. The right has greater breadth, flexibility and generosity."

In 2003 I put forth the argument that the survival functions of the right and not the language functions of the left are dominant in the development and in psychotherapy. More recently I've described how the highest human functions – stress regulation, humour, empathy, compassion, creativity – are all right brain functions. And I'm suggesting that an expanded capacity for right and not left brain processing lies at the core of clinical expertise. Much of the knowledge that accumulates with clinical experience is implicit, and operates at rapid unconscious levels of the therapeutic alliance. Indeed I see the change mechanism as being located primarily in the connections between the prefrontal cortical and subcortical areas of the right brain. So with respect to the paradigm shift in psychotherapy, clinical models are now moving from left brain to right brain, from the mind to the body, and from the central to the autonomic nervous system.

Halasz Now we could develop that into another conversation which I would be thrilled to do. But in our final phase I'd like to ask a set of questions centred on the implications of this paradigm shift for the mental health professions in the broadest terms. Would you cast your thoughts and vision beyond the health world, to education, curricula, the legal world, and the wider culture impacted by the paradigm change. We're already seeing evidence of this, but perhaps you could cast your mind five years hence maybe with examples from Europe, Canada, Australia and obviously here in the US.

Schore In the last 10 or 20 years the expansion of knowledge in science, psychiatry, and psychology has been absolutely remarkable. How this knowledge will be used in the mental health professions, not only in the delivery of service, but how it will be used in the training of the next generation of therapists is now an active area of inquiry. Older ideas about what is required for a basic knowledge

base for all health care professions must now be updated and radically altered.

The problem we're grappling with is not just the significant amount of new information, but also the way that we're conceptualising this interdisciplinary information. Previously I mentioned the Cartesian mind/body split. This has plagued not only liaison psychiatry, but psychosomatic medicine and pediatrics. The biopsychosocial perspective of regulation theory and its focus on adaptive and maladaptive emotional processes can serve as the basis for new integrative treatments of mind and body. I see psychosomatic disorders as the next frontier. Toward that end in a Presidential Address to the American Psychosomatic Society Richard Lane (2008) has stated, "The physiology of emotion is arguably the cornerstone of psychosomatic medicine...aversive emotional states are associated with adverse health outcomes."

In a recent article in the *Journal of the American Medical Association*, Glass (2008) concludes, "There is increasing evidence from studies of the 2-way relationship between brain structure and function on the one hand and emotion and behavior on the other indicating that such a notion of separate biological and psychological treatment effects is simplistic and inaccurate." It's now becoming apparent that that the idea that psychology changes the mind and that biology changes the brain is outmoded. Kandel has recently argued there is no longer any doubt that psychotherapy can result in detectable changes in the brain (Etkin et al., 2005).

These findings challenge the recent trend of psychiatry training models that exclusively focus on psychopharmacology and devalue psychotherapy. This trend has been particularly alarming in child psychiatry. Psychiatry needs to re-evaluate whether or not psychotherapy will be part of what it has to directly offer patients, rather than delegating it out to the other professions.

Now that the early roots and expressions of psychopathology are being understood in terms of interpersonal neurobiology, interventions, both preventive and therapeutic, need to take place at the critical earlier stages of life. The current generation of more complex developmental and clinical models is also allowing updated relational-affectively focused psychotherapy to be used with populations heretofore seen as refractory to cognitive and behavioral psychotherapy. There

are limitations of interventions that utilize mainly left brain conscious cognitive mechanisms to deal with the involuntary non-conscious affective and interpersonal deficits of the major psychiatric disorders. And so we're now seeing breakthroughs in the psychotherapeutic treatment of severe personality disorders, a group that was earlier thought to be refractory to the talking cure.

On the matter of training - psychiatrists, psychologists and social workers need to be informed about the interpersonal neurobiology of attachment, not only in early development, but also how these dynamics are playing out not only in the patient's psychopathology but in the relationship between the patient and the therapist. This information is relevant to more than the psychotherapeutic relationship. As you're well aware the relationship between the doctor and the patient is now being addressed not only in psychiatry but in internal medicine journals.

Current advances in our understanding of nonverbal communication, transference, unconscious motivation, right brain functions, and the central role of affects is relevant to all medical disciplines. Note that psychodynamic concepts are re-entering into all forms of psychotherapy. In fact recent research documents that long-term psychodynamic psychotherapy is effective in the treatment of patients with personality disorders, multiple mental disorders, and chronic mental disorders (Leichsenring & Rabung, 2008). But at an even deeper level, the reincorporation of updated psychoanalytic concepts and ideas about the impact of attachment trauma on brain development could allow for the integration of the deep split between biological psychiatry and dynamic psychiatry.

Halasz So with all you're saying are you suggesting that that not only science but psychiatry in particular is now open to a paradigm change?

Schore Absolutely. And let me add a few more thoughts on that. Psychiatry has a long-standing interest in the genetic contributions of the neurodevelopmental origins of psychiatric disorders. We're now looking at a real challenge to genetic reductionism by the current epigenetic model which is showing that the methylation of the DNA occurs post-natally and that the mother/infant interaction impacts that genetic mechanism. This area of ongoing research, plus the finding that the

amount of DNA and RNA increases substantially in the cortex over the first year of life challenges the long-held incorrect assumption that everything before birth is genetic and everything after birth is learned.

But I also want to point out that the paradigm shift will come in the shift from looking at genetics in terms of purely Mendelian mechanisms in the cell nucleus and moving into maternally-inherited mitochondrial DNA. It is often forgotten that all eukaryotic cells contains not one but two very different genomes, and that the mutation rate of mitochondrial DNA is much more rapid than nuclear DNA. Neurology is now actively looking into dysfunctions of mitochondrial DNA in Parkinson's and Alzheimer's diseases. I predict an expansion of current studies on mitochondrial DNA mutations in psychiatric disorders.

Halasz I think those trends would probably test the limits of the knowledge base of most neurologists on the one hand and psychiatrists on the other. Finally, I'll ask you to turn your mind to the paradigm shift's impact on society more widely, beyond the health professions?

Schore In *The Master and His Emissary* McGilchrist warns, "The left hemisphere is the emissary of the right which is its master. The emissary, however, is wilful; believes itself superior and sometimes betrays the master bringing harm to them both." I agree that especially western cultures are, even more so than in the past, overemphasizing left brain functions. Our cultural conceptions of both mental health and education continue to narrowly over-stress rational, logical, analytic thinking over holistic, bodily-based, relational right brain functions that are essential to homeostasis. We need to reflect more broadly on what is required, at levels of the individual, family, and culture, to provide an optimal context for mental and physical health. This includes not only culturally supporting certain intellectual and cognitive abilities but also fostering the capacity to relate socially and emotionally to other human beings via the right brain functions of stress regulation, affect processing, empathy and intersubjectivity. The recent findings about the critical survival functions of the right brain can be applied not only to individuals but to cultures.

The new information that science is providing on attachment, trauma, emotions and right brain development is directly relevant to the treatment of the social-emotional disturbances that lie at the core of a spectrum

of mental disorders. But beyond that this knowledge also has practical value in generating more complex models of human growth and development, that is for the optimisation of brain maturation and human potential. This is especially true for brain development in the critical periods of the brain growth spurt in infancy. Other professions would also greatly profit from this knowledge. Judges and attorneys in the area of family law are now becoming extremely interested in using current science in order to make informed “Solomonian” decisions about “joint custodies.” They need to be aware of what we now know about the enduring effects relational trauma in the first year of life.

We’re now seeing a continual stream of information from neuroscience entering into education, the humanities and the arts, which is also diffusing into the general public. This information can be used or misused. A case in point - about two years ago *Time* magazine reported on the frontiers of brain research, and the practical applications of the advances in neuroscience. In that article a number of interviewees described its relevance to neuroeconomics, and how brain centers involved in consumer habits and political decision making could be influenced by manipulations of unconscious processes. In contrast, in my portion of the article I spoke of affective and social neuroscience as potential sources of a deeper understanding of the interpersonal neurobiological origins of not only love and compassion, but also of relational trauma hatred, violence, depression, and suicide.

Halasz Do you think that the larger culture is ambivalent about delving more deeply into these fundamental problems of the human experience?

Schore I do. We speak of intrapsychic defenses against pain as existing in individuals. But defenses such as repression and even dissociation are collectively used by the culture to avoid more directly confronting the serious stressors we’re now facing. My colleagues and I are now working on two upcoming books on this matter: *The Impact of Early Life Trauma on Health and Disease: The Hidden Epidemic* (Cambridge University Press) and *Human Nature and the Environment of Evolutionary Adaptedness* (Oxford University Press). These volumes reveal a number of serious psychological and social problems behind our cultural blindspots. But more than that, in these books contributing

scholars from multiple disciplines examine what types of early-life care are essential for optimal development of human brain and body systems—in order to promote greater understanding in scientific research and theory, public policy, and family practice.

At the very beginning of my 1994 book I stated, “The understanding of early development is one of the fundamental objectives of science. The beginnings of living systems set the stage for every aspect of an organism’s internal and external functioning throughout the lifespan.” This principle is now accepted, and it refers not only to the origins of a predisposition or resilience to mental disorders, but also to the pre- and postnatal precursors of physical diseases such as cardiovascular disease, stroke, diabetes and hypertension. At this point in time there is converging evidence that we can maximize the short and long term effects of our interventions by concentrating on the period of the brain growth spurt – from the last trimester of pregnancy through the second year. Whether or not our governments will fund such sorely needed efforts remains to be seen.

Halasz As a scientist yourself, your primary job is to promote the developmental sciences. And it is up to culture generally to see what it decides to do with the new information that’s made available by the scientists.

Schore Exactly.

Halasz Now as a final theme could I round off on a more personal note. In the dedication of your last book to Judy, your wife, you stated, “wing to wing, oar to oar.” Would you like to comment where that quote came from?

Schore Actually the real source is Robert Frost, one of my favorite poets. Some years ago our family was travelling in New England and we came upon Robert Frost’s family grave in Bennington, Vermont. Below Frost’s name was his wife’s Elinor, and beneath that was the inscription, *Together Wing to Wing, Oar to Oar*. I was instantly struck by the elegant message about the essential qualities of a long term relationship. The idea that their intimate bond had the breadth and depth to share their toil and struggle, yet also the soaring and elated moments of life, had great meaning to Judy and I. And still does for some 45 years.

Halasz Over the delightful lunch Judy prepared, you mentioned that you have a joint invitation next year (2010) to present a day at New York

University. What a fitting way to acknowledge this joint venture.

On this note, I thank you for sharing your extraordinary journey, bringing about a paradigm change to which you, as you always do, bring a personal vitality to that word. After our conversation I feel this paradigm change with an even greater sense of immediacy. So I thank you so much.

Schore Thank *you*, George.

REFERENCES

1. Etkin, A., Pittenger, C., Polan, H.J., Kandel, E.R. Toward a neurobiology of psychotherapy: Basic science and clinical applications. *Journal of Neuropsychiatry and Clinical Neuroscience* 2005; **17**: 145–158.
2. Glass, R.M. Psychodynamic psychotherapy and research evidence. Bambi survives Godzilla? *JAMA* 2008; **300**: 1587–1589.
3. Kazdin, D.A. Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology* 2007; **3**: 1–27.
4. Lane, R.D. Neural substrates of implicit and explicit emotional processes: a unifying framework for psychosomatic medicine. *Psychosomatic Medicine* 2008; **70**: 214–231.
5. McGilchrist, I. *The Master and his Emissary*. New haven: Yale University Press, 2009.
6. Schore, A.N. *Affect Regulation and the Origin of the Self. The neurobiology of Emotional Development*. New Jersey: Lawrence Erlbaum, 1994.
7. Schore, A.N. *Affect Regulation and the Repair of the Self*. New York: W W Norton, 2003.
8. Schore, A.N. *Affect Dysregulation and Disorders of the Self*. New York: W W Norton, 2003.
9. Schore, A.N. The paradigm shift: The right brain and the relational unconscious. Invited plenary address to the American Psychological Association 2009 Convention. August 8, 2009, Toronto, Canada, 2009.
10. Schore, J.R., Schore, A.N. Modern attachment theory: the central role of affect regulation in development and treatment. *Clinical Social Work Journal* 2008; **36**: 9–20.
11. Shedler, J. The efficacy of psychodynamic psychotherapy. *American Psychologist* 2010; **65**: 98–109.