

**THE SOLO PIANIST:
A CRITICAL ANALYSIS OF CONCEPTS OF MUSICAL GIFTEDNESS**

Angela Chan

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By: Angela Po Yiu Chan

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_____ Chair

_____ External Examiner

_____ Examiner

_____ Thesis Co-supervisor

_____ Thesis Co-supervisor

Approved by _____
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_____ 1995.

Dean of Faculty _____

ABSTRACT

The Solo Pianist:
A Critical Analysis of Concepts of Musical Giftedness

Angela Po Yiu Chan

This thesis, proceeding from an interdisciplinary perspective, offers a critical analysis of the premises governing concepts of musical giftedness and their relevance to the understanding of the nature and development of the solo virtuoso pianist. Drawing on research in psychology, education and piano pedagogy, it examines the specific characteristics of the virtuoso performing experience with special reference to the relationship between the pianist and her¹ instrument, performing environment, and audience. In particular, it discusses the cognitive and physical demands placed upon the artist in preparing for and performing "live" in concert.

In examining the premises underlying representative theoretical frameworks as well as more widely used evaluative measures of music ability, the study identifies several major limitations. These include: (1) Concepts of giftedness have been considered by most researchers as domain general rather than domain specific. (2) A precise operational definition of pianistic giftedness

¹ To maintain a natural flow, the feminine pronoun "her" will be used instead of "his/her" throughout this text.

is not currently available. (3) Most of the studies reported in the literature have not adequately addressed the developmental realities and characteristics specific to any of the sub-discipline of musical performance. In particular, this thesis argues that the most significant inherent weaknesses in existing tests of musical performance abilities are their undue reliance on isolable and easily quantifiable components, such as acuity of aural perception and sight-reading accuracy, as the primary measures and predictors of high level musical performance skills.

The thesis concludes that researchers intending to study the nature of giftedness — or, for that matter, any aspect of the solo virtuoso pianist — must first address the web of interactions faced by the pianist aspiring to high level achievement. With this in mind, the thesis argues for a collaborative, interdisciplinary model upon which future research agendas might be established — a model that neither compounds the problem, nor trivializes the nature of the performing experience itself.

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TABLE of CONTENTS

List of Tables	x
Epigram	xi
Chapter 1. Introduction	1
<i>Operational Definitions</i>	3
<i>Keyboard Literature</i>	8
<i>Purpose of Thesis</i>	11
Chapter 2. Piano Performance "Live" — A Real-Time Performance	14
<i>"One-take" Event</i>	14
<i>Variability and Risk</i>	15
<i>Solo and Ensemble Performance: a distinction</i>	17
<i>The Recording Studio</i>	18
<i>Real-time Performance: an open skill</i>	18
<i>Summary</i>	19
Chapter 3. Physical Characteristics of the Piano & its Implications for the	Solo
I. <i>Standard Keyboard Length and Octave Span</i>	23
II. <i>The Linear Design of the Keyboard</i>	24

TABLE of CONTENTS

Chapter 3. Physical Characteristics of the Piano & its Implications for the	Solo
<i>III. Fixed Height of the Keyboard & Fixed Distance Between the Keyboard and Pedals</i>	28
<i>IV. Variable Resistances in the Weight of Piano Keys</i>	29
<i>V. Relationship of the Pianist with the Sound Source</i>	32
<i>VI. The Piano as a Stringed-percussion Instrument</i>	34
<i>VII. The Piano as a Harmonic Instrument</i>	36
<i>VIII. Use of the Pedals</i>	38
<i>Technological Development of the Piano and Emergence of the Solo Pianist</i>	39
<i>The Virtuoso Pianist</i>	46
<i>Physical Relationship of Pianist to Piano: Obstacle or Challenge</i>	49
Chapter 4: Concept of the Gifted Pianist	52
<i>Studies of Giftedness</i>	52
<i>Towards a Definition of "Musical Giftedness"</i>	54

TABLE of CONTENTS

Chapter 4: Concept of the Gifted Pianist (Continued)	69
<i>The Piano Competition</i>	69
<i>Perceiving Giftedness: Constraining Factors</i>	71
I. Social and Cultural Influences	71
II. Pedagogical Assumptions and Considerations	74
III. Evaluation Procedures	78
IV. Specific Measures of Musical Performance	83
<i>Summary</i>	88
Chapter 5: Conclusion	90
<i>Future Research: Suggestions for Inter-disciplinary Collaboration</i>	93
<i>Coda</i>	96
Bibliography	98

Table 1. Summary of the distinction between Live, Ensemble and Recorded I

Table 2. Relationships of Pianist to the Source of Sound 35

Table 3. Percussive Features of the Piano and their I

Table 4. Physical Characteristics of the Piano and its Implications for the Solo
Pianist (Summary Table) 43

Table 5. Listing of Studies of Musical Giftedness 55

The reasonable man adapts himself to the world.
The unreasonable man persists in trying to adapt the world
to himself.
Therefore, all progress depends on the unreasonable man.

George Bernard Shaw

Few tragedies can be more extensive than the stunting of life, few
injustices deeper than the denial of an opportunity to strive or
even to hope, by a limit imposed from without, but falsely
identified as lying within.

The Mismeasure of Man
Stephen Jay Gould

CHAPTER 1: INTRODUCTION

Speculation on the gift of making music has undoubtedly been one of
the most enduring pre-occupations of philosophers, poets, pedagogues,

educators, and in recent years, scientists. From ancient notions about possession by divine powers to contemporary investigations into the properties that define its elusive qualities, the musical gift has continued to intrigue, puzzle and challenge those who attempt to decipher its mysteries. Claude Levi Strauss' observations here are instructive:

... music is the only language with the contradictory attributes of being at once intelligible and untranslatable, ... and music itself [is] the supreme mystery of the science of man. (Storr, 1992, p. ix)

It is unlikely that music will ever reveal its innermost, untranslatable, secrets. There are however, attributes of the supremely accomplished performer that are not only amenable to study, but have the potential of focusing "intelligible" light on the nature of the musical experience and those who communicate it. While this light may not solve the "supreme mystery" it will, at the very least, illuminate our understanding of its power to move so many of us so profoundly.

In this regard, it is significant that for the past four hundred years performing musicians and pedagogues have made concerted efforts to better understand and optimize their powers of communication (Bukofzer, 1944). The reasons are both aesthetic and practical. Beginning with the emancipation of secular music in the sixteenth century, and the consequent growth of stage (opera) and court/art (vocal and instrumental) music, we get an inevitable increase in specialization. Increasing specialization obliged performers to become consciously aware of the means by which they were communicating their musical intentions, i.e., *means that were specific to each instrument and each performing situation* (Donington, 1970). How these means could most effectively

be communicated generated questions of technical fluency, taste, beauty of tone, articulation, tempi, expressive shaping of phrase and related aesthetic criteria. Over the years these criteria have been discussed, argued over, formalized, challenged and revised by influential theorists and pedagogues (Bukofzer, 1944; Donington, 1970; Gerig, 1974).

The result has been an enormous outpouring of analytical, theoretical, biographical and pedagogical works — in effect, a growth industry that continues to the present day. And by far the largest body of works in the literature that has emerged is that dedicated to keyboard performance. From Diruta (1597), C.P.E. Bach (1753), Hummel (1828), Czerny (1839), to Ortmann (1927) and Matthay (1905, 1913), we get an ever-growing compendium of published attempts to come to terms with the "gift" and its cultivation. In our own century, scientists, examining the issue of musical giftedness from a variety of perspectives, have initiated studies and devised tests aimed at making sense of its underlying properties. Typical are: psychology (Bamberger, 1985; Csikszentmihalyi, 1988, 1993; Palmer, 1992; Revesz, 1925; Richet, 1901; Shaffer, 1992; Shuter-Dyson, 1985; Sloboda, 1991; Stumpf, 1909) with considerable cross-over with education (Bloom, 1985; Feldhusen, 1986; Feldman, 1990; Gardner, 1982; Renzulli, 1978, 1986; Sosniak, 1985). It is curious, however, that few of these studies address the defining characteristics of the solo virtuoso pianist. For the most part, they confine themselves to conceptual frameworks capable of generating operational definitions, cognitive theories or empirical research. With a few exceptions, they have not concerned themselves with the origins,

nature, character, and unique abilities that specifically manifest themselves in *piano performance*. This no doubt reflects, in part, a concern for the universal elements that may underlie musical giftedness in general. However, as we will show, the omission of the domain specific aspects of giftedness (in this case — the solo virtuoso pianist) has seriously compromised our understanding of this universal phenomenon. To highlight these omissions, we turn now to a discussion of the premises underlying these approaches.

Operational Definitions

A number of interesting operational definitions on the general question of giftedness have been posited by various researchers. Renzulli (1978), for example, proposes that the interaction of three significant traits, namely (1) above average ability, (2) creativity and (3) task commitment are necessary for any high-level creative performance. By Renzulli's definition, average ability refers to either general or specific abilities. As he sees it, general ability involves ability in areas such as information processing and abstract thinking while specific abilities involve the capacity to acquire requisite skills necessary for high-level performance in a specialized domain. Creativity can be broadly summarized in terms of flexibility and originality of thought, receptiveness to innovative ideas, aesthetic sensitivity and the courage to take risks. Finally, task commitment refers to the individual's ability to remain totally immersed in an area of expertise for an extended period of time. Renzulli argues that while the above-average-ability trait remains relatively stable, creativity and task

commitment may fluctuate widely throughout the course of an individual's life. He also maintains that even though these three traits may differ considerably from each other in magnitude, case studies and research indicate that exceptional degrees of one trait can have a significant effect on compensating for weaker traits.

Feldhusen (1986), on the other hand, proposes that giftedness can be conceptualized within four principal components: (1) general intellectual ability, (2) special talent, (3) positive self-concept, and (4) achievement motivation. He argues that these four dimensions in conjunction with nurturing opportunities are integral to the development of high-level performance. In another study, Feldhusen (1984) proposes a "school-based" conception of talent which relates talent to specific domains such as (1) Academic-intellectual, (2) Artistic-creative, and (3) Vocational areas. Within each domain there are various categories of talent, each capable of being further divided into sub-categories. For example, the artistic-creative domain can be divided into areas such as music, dance, drama, sculpture, graphic and photography. Within the domain of music, talent may manifest itself through performance, composition, etc.

Haensly, Reynold and Nash (1986), proceeding from an integrative perspective, see giftedness as a product of the interaction of the individual and her environment. They also propose a four component scheme: (1) coalescence — the way in which the abilities come together and function in synchrony, (2) context — the situational factors that determine the worth of a particular achievement, (3) conflict — a factor which shapes and hones the development

of the individual, and lastly (4) commitment — willingness to preserve and adhere to the development of excellence.

Feldman (1990), on the other hand, identifies at least four different time frames which he claims must converge for prodigious talent to emerge. These four time frames are (1) the individual's life span; (2) the developmental history of the field or domain; (3) cultural and historical developmental processes of musically gifted individuals (Phillips, 1976; Sergeant & Thatcher, 1974; Sloboda & Howe, 1991). For example, Sergeant and Thatcher (1974) studied the interrelationships between four factors, namely: intelligence, musical abilities, home environment and socio-economical backgrounds, while Phillips (1976) investigated the relationship between musicality and intelligence by means of musical cognition tests administered to 194 children from four different social groups. Sloboda and Howe (1991), on the other hand, examined the effects of social and motivational influences on the development of children enrolled in a special school for the musically gifted.

A small number of longitudinal studies have followed up on the development of prodigies and professional musicians. Most notably, Revesz's (1925) *The Psychology of a Musical Prodigy* accounts for the early life and artistic development of pianist, Erwin Nyiregyházi (1903-1987) over a period of six years, (from 7 to 13 years of age). More recently, Manturzevska (1990) conducted an exploratory study of the development of 165 Polish professional musicians (ranging in age from 21 to 89). This study concentrated on background factors influencing the various developmental stages of their

musical careers.

Feldman (1980) departing somewhat from the widely held notion that musicality is a uniquely genetic entity, argues that musical prodigiousness results

from a rare coincidence of gifts and opportunities. He further argues that prodigies usually go through the normal sequence of learning in their chosen fields, but at an accelerated rate.

Sosniak's research (1985) into the development of twenty-four concert pianists records interesting aspects relating to the formation of this very special class of performing artists. Sosniak divides the developmental process into three broad phases — the early, middle and later years. The early years of development are characterized by playful moments at the instrument with immediate rewards from parents and teachers. The middle phase, which begins when the pianists are in their early teens, is marked by detailed training in performance technique and musicianship. The later years focus on the development of personal styles and aesthetic judgement. In progressing from one phase to another, the individual experiences changes in behaviour, perception and experience. Although these three phases are not discrete, the author suggests that they can be identified by studying the pianist's relationship with the piano and the musical environment; the roles of parents and teachers in the individual's developmental process; and the factors motivating success. Perhaps of greatest significance is Sosniak's observation that concert pianists on average spend seventeen years preparing for their careers — a time factor in the

learning process that had not been addressed in previous studies. It should be noted however, that Sosniak's observations are very general and, for the most part, self-evident: for example, while she notes the obvious importance of teachers and parents, she does not take into account the particular dynamics of these relationships - the interplay of interpersonal, socio-economic and cultural factors that enter into the cultivation of a solo virtuoso pianist. Perhaps of greatest importance, Sosniak does not acknowledge those factors in the relationship between pianist and piano that ultimately determine the development of virtuoso level skill and performance creativity.

Winn (1979) proposes that a critical period of transition occurs in the lives of musical prodigies during adolescence. Bamberger (1982) concurs with Winn and further suggests these cognitive changes are significant factors that contribute to a "mid-life crisis" or critical turning point in the musical prodigy's development. During this transitional phase, the young performers undergo a dramatic transition in their "internal representation of musical structure" — that is, from an intuitive or "figural" mode to a newly emerging, "formal" mode of musical representation. Unless they can successfully work their way through this career crisis, these hitherto prodigies are likely to find themselves dismissed as second-rate musicians or, tragically, to slip into artistic oblivion.

It is rather curious that virtually none of these studies identify the special underlying developmental and related factors that distinguish the solo concert pianist from other musicians. With the possible exception of Sosniak (1985) and Judd (1988), none seem to be aware of the distinction. In his study on specific

areas of musical talent (1988), Judd briefly addresses the different musical skills involved in composing and performing, and the fact that every musical instrument demands unique skills for its mastery. By way of example, he mentions the component skills required in playing the marimba in an African band, and playing the violin in a symphony orchestra. In any event, Judd approaches the problem from a purely neuro-psychological perspective, giving little consideration to the factors that — from the perspective of the performing artist — distinguish giftedness from self-evident generalizations.

Keyboard Literature

The literature on keyboard pedagogy is comprised of a vast and somewhat bewildering and contradictory repertoire of works stretching over some four hundred years. Beginning with Diruta (1597) through C.P.E. Bach (1753) to Matthay (1905, 1913), Fielden (1927), Ortmann (1962), Neuhaus (1972) and Sandor (1981) in the twentieth century, we get a massive collection of technical studies, theoretical treatises, methods, "how to" books, and journals covering virtually every aspect of keyboard performance from stage deportment to the minutia of physiological organization. In recent years, the literature has expanded to include periodicals such as *Etude*, *Piano Quarterly* and *Clavier* directed to the wider music loving public, as well as anecdotal biographical studies of historical figures and verbatim conversations with contemporary pianists (Loesser, 1954; Mach, 1980; Schonberg, 1983). Historical surveys covering the evolution of piano techniques, such as Gerig (1974) have also

proliferated, as have general overviews of the lives of prodigious musicians (Fisher, 1973). While in retrospect, the literature on the piano as a whole provides us with a useful guide to the thinking of master teachers, pedagogues, historians, biographers — and in some cases, the artists themselves — it tells us little about the nature of pianistic giftedness and the cognitive processes involved in its cultivation (Cohen, 1992).

Given the rather scattered, confusing and inconclusive conceptions of musical giftedness that have emerged from both the scientific and musical communities, it might be useful at this point to ask the following questions.

— (1) In their attempts to generate an operational definition of musical giftedness, have researchers paid adequate attention to those abilities that distinguish each of the various sub-disciplines within the general domain of music from one other?

— (2) Have researchers overlooked some of the major qualities that distinguish a virtuoso performer from the merely skilled musician? It seems that subjects selected for research studies on the basis of showing "musical giftedness" may range anywhere from concert pianists and music students to part-time professionals, dedicated amateurs and mono-savants (updated from "idiot savants").

— (3) Do we have any working operational definitions of pianistic giftedness,

and if so, do any of the existing concepts of musical giftedness provide a framework adequate for a meaningful investigation of the defining characteristics and development of the solo virtuoso pianist? Do they, for example, account for the dynamic complexities of the relationship binding the performer to the piano, the music and the audience? And most important, are they capable of dealing with textual deviations such as creative variability in timing, tone control, articulation and phrase patterning that are characteristic of the solo virtuoso?

On the basis of the foregoing, we may ask whether researchers are relying too heavily on aspects of musical activity that are incidental to an understanding of virtuoso level musicianship. We may also ask whether, for example, it is sufficient to confine oneself to the more self-evident quantifiable components (such as mechanical accuracy, simple aural discrimination or musical memory), on the assumption that one or the other represents a meaningful measure of musical giftedness. While the prevailing reductive approach may be adequate for the study of simple mechanical skills, the question here is whether it is equally appropriate for the study of a complex performing art (Priour, 1994).

Taken as a whole, these questions ask whether a comprehensive review of the pianistic experience might help deepen our understanding of the characteristics that identify the supremely gifted performer. There is an

interesting consequence that might follow from such a review. Given the complex nature of the experience and the very different perspectives that distinguish its study by scientists from that of artists and performance analysts (Cohen, 1992), it is hoped that this review may encourage research that is more collaborative and participatory rather than the more common practice of separating researchers from subjects.

Purpose of Thesis

This thesis will expand upon the premise that a phenomenon as complex and elusive as the nature of piano performance can only be effectively articulated through an interdisciplinary perspective. With this in mind, it will draw upon music pedagogy/performance theory and analysis, psychology and education in an effort to identify and elaborate upon certain interactive challenges that enter into the development of a solo virtuoso pianist. In the process, it will distinguish the solo virtuoso performer from musicians engaged in other musical endeavours. And since it will be examining the phenomenon from a critical, interdisciplinary perspective, it will draw inferences that might shed new light on concepts of musical giftedness. In the chapters that follow, we will:

- (1) Look into the unique characteristics of solo piano performance, the psychological demands imposed upon the performer in the context of a "one-take,

- live" performance, and the essential elements involved in the dynamic interaction between the pianist, the piano and the performing environment;
- (2) Examine the special physical demands imposed upon the pianist by the instrument. The examination will focus upon (a) the characteristic features of the piano, (b) the conditions under which the gifted solo pianist performs and (c) the technological development of the instrument;
 - (3) Critically examine the premises underlying representative studies of "gifted" performing musicians from the disciplines of psychology, education and piano pedagogy; identify their relevance to the understanding of high calibre pianism;
 - (4) Consider the difficulties involved in reaching a meaningful consensus on the nature of pianistic giftedness;
 - (5) Discuss some of the more influential measures used to identify musical (perceptual and performance)

ability; and

- (6) Examine the relevance and implications of current conceptions of musical giftedness to the development and performing experience of the gifted solo pianist.

CHAPTER 2: PIANO PERFORMANCE "LIVE"— A REAL-TIME EXPERIENCE

This chapter will begin by identifying certain features unique to the solo pianistic experience. By distinguishing live solo performance from all other musical activities engaged in by pianists, it hopes to set the stage for further discussion of the role domain specific characteristics might play in a theory of musical giftedness.

"One-take" Event

A live piano performance, unlike a recording, a composition, or for that matter a painting, is a "one-take" event executed and communicated in unreflected, unbroken "real-time" (Cohen, 1987, 1992; Nachmanovitch, 1990). A degree of variability under these circumstances is inevitable; once the first note is sounded, it and every subsequent sound becomes an irrevocably committed risk. Every live performance is, therefore an independently creative act. It follows that no two performances of the same piece of music — even by the same performer — can ever be identical in every respect. This remains true even though the player's aural signature imprints itself indelibly upon the music, and hopefully, on the listener's ear.

This spirit of dynamic unpredictability is very well articulated by the great American jazz saxophonist, Ornette Coleman (b. 1930 -) " ... the same note can be played night after night but differently each time." While Coleman's comment may be evident in jazz, it is equally true for even the most rigidly composed piece of classical music. Picking up on Coleman, Professor Philip Cohen (1988) concludes, "By its very nature, every real-time performance, whether notated or freely composed, is an improvisation in one form or another".²

Variability and Risk

² Work in progress. (Cohen, 1994)

A convincing live performance is more than a question of aesthetic sensibility or the ability to maintain a high order of aural concentration over a lengthy period of time. Neither can it easily be reduced to well-practised physical and mental co-ordination. While performing live the pianist must be alert to the constantly changing performing environment emerging from the instrument, the room, the audience and herself (Cohen, 1986). As concert pianist Joseph Banowetz (1992) describes it,

... no facet of piano playing is so much at the mercy of ever-shifting performance conditions — the instrument being played, the acoustics of the hall, and the inevitable moment-by-moment reactions of the performer. (p. vii)

Implicit in Banowetz's description is the ability to make sensed judgements, that is, to convey one's musical intentions by synchronising the relationship between these intentions and the sounds emanating from the instrument. The experience is more than a question of action and reaction, but rather of continuous feedback and response to a multiplicity of simultaneous events flowing in "real time". This sense of immediacy demands a level of attention capable of sustaining itself from moment to moment over long stretches of time in an unstable environment. By way of a rough analogy, we might compare a live musical performance to that of a climber attempting to negotiate a treacherous mountain terrain. No matter how well prepared the climber may be, he or she knows that there is no fail-safe prescription for making it to the top, no map, however detailed, capable of providing "step-by-step" guidance. In the act of climbing every step must be sensed, evaluated and acted upon anew,

no matter how many successful forays up the mountainside the climber has completed. This process of making sensed judgements at every step in response to the "feel" of an ever changing and often unpredictable environment is precisely what a pianist attempting to scale the heights of say a Transcendental Etude³ by Franz Liszt must contend with. And when the inevitable error in judgement does occur, the pianist, like the climber, must be capable of instantaneously sensing how, when and where to make the next move — that is, how to turn a potential disaster into a triumph over the odds. In both cases, the quality of interaction presumes a degree of intimacy between the performer and the open-ended environment that resists facile explanations about a well-practised skill. Composer Roger Sessions' sums up this point admirably:

The basic ingredient of music is not so much sound as movement ... I would even go a step farther, and say that music is significant for us as human beings principally because it embodies movement of a specifically human type that goes to the roots of our being and takes shape in the inner gestures which embody our deepest and most intimate responses. (Sessions, 1965).

In the section that follows we will expand further upon the stage experience of the solo pianist, with a particular emphasis on those aspects that distinguish it from the experience of the recording artist and the ensemble player. We would hope this exercise will point up the importance of addressing the interactive process in any discussion of the nature, cultivation and

³ Franz Liszt's monumentally difficult Transcendental Etudes are generally acknowledged as among the most technically demanding in the standard repertoire.

development of giftedness in the musical performer.

Solo and Ensemble Performance: a distinction

The most obvious difference between an ensemble player and a solo pianist is that the latter must face the audience alone. Actually, in a traditional stage situation, the solo pianist sits with her profile to the audience (Schonberg, 1987). There is little or no eye contact, and therefore little or no listener feedback until the piece ends, signalling (hopefully) a burst of applause. The implications of being denied normal face to face interaction cannot be overstated. In effect, for a performer to be alone on stage is to be the sole focus of attention, the potential idol or fallen hero of the evening. While the secure artist may revel in the creative challenge of risking all, for most others, having to deal with a host of internal and environmental distractions — doubt, anxiety, the audience, lights, an unfamiliar hall or instrument, sudden noises, etc — without support or feedback from other musicians can be a profoundly unnerving experience.

The Recording Studio

The experience of performing in a recording studio "cold" without an audience is somewhat more ambiguous. While some pianists find the relative isolation even more nerve racking than playing live, they at least have the option of taking as many repeats as are needed — with supportive feedback from the producer, director, and technical personnel. Apart from lack of audience feedback and "mike-fright", the excitement and potential anxiety of

performing under scrutiny is dramatically reduced from that experienced in a live concert hall performance. In any event, undesirable sounds can always be "engineered" out⁴.

Real-time Performance: an Open Skill

Allard and Starkes (1991) expanding upon Poulton (1957) distinguish between an "open" and a "closed" skill. A closed skill may be defined as a skill that is displayed in a consistently stable environment (Poulton, 1957), while an open skill is displayed in a moving and dynamic environment. In this sense, a live musical performance undoubtedly falls into the latter category (Segalowitz, in preparation; forthcoming; Segalowitz & Abrahamowicz, 1992). And, given the fact that even a change of setting from the practice studio to the concert platform may add factors capable of upsetting even the best prepared artist, it might be useful to think of the skill of the successful soloist as being particularly open to any contingency, whatever the environment. Therefore, the challenge for the solo pianist lies in internalizing strategies for optimal (creatively inspired) performance⁵ regardless of the constraints of a specific time, location

⁴ To Glen Gould, the challenge for the gifted performer resides in the need to re-create the musical text in a self-fulfilling manner, and in the process to transcend the limits imposed by the environment and within oneself. It was for this reason that Gould chose to confine himself to studio recordings rather than perform "live". No longer at the mercy of a "do-or-die" concert performance, he was now free to structure his ideal performance from as many "takes" and splices as he needed. (Page, 1984).

⁵ Csikszentmihalyi (1988) describes the optimal experience of "flow" as achieving a balance between the challenges encountered in a specific task and

and atmosphere. The dream of every performer, of course is a Saturday evening concert at Carnegie Hall, blessed with an eager audience and, hopefully, one or two equally receptive critics. Table 1 summarizes those factors that distinguish a live solo piano performance from ensemble and studio recorded performance.

Summary

In this overview of the unique nature of the solo pianist's performing experience, we have noted that a live performance is, by definition, a "one-take" event that must be executed in real-time while subject to contingencies in which a high degree of risk is inevitable. The pianist must therefore be prepared to anticipate these contingencies and respond accordingly. He or she must, in effect, make creative sense of the constantly changing performing environment emerging from the instrument, the performing space, the audience and oneself. This implies an ability to make instantaneous, sensed judgements with little margin for error and no opportunity for backtracking. Finally, in a live solo performance, the pianist must face the audience alone — a factor that can become a major source of distraction or anxiety at any level of competence.

As we shall see, these considerations have significant implications for any theory of musical giftedness broad enough to include the solo pianist. In particular they oblige us to ask whether the relative absence of domain specific distinctions in current theories has deprived researchers of the tools needed to

the skills the person brings to it.

address the issues involved with any degree of precision⁶.

⁶ While for example, virtuosity of a high order may enter into ensemble performance (e.g. concerto / chamber music), the fact of *interchange* between musicians differentiates these experiences from that of solo performance.

Table 1.

Summary of the distinction between Live, Ensemble and Recorded Performance

Solo Piano Performance (Live Performance)	Instrumental Ensemble Performance (Live)	Performance in the Recording Studio
One take, real- time performance.	One take, real-time performance.	Multiple takes are normal. "Rarely" a real time performance.
Complex physical and mental co-ordination skills involved.	Complex physical and mental co-ordination skills involved.	Complex physical and mental co-ordination skills involved.

<p>Requires constant instantaneous response to the performance environment (feedback from piano, physical sensations, extraneous sounds, audience, hall acoustics).</p>	<p>Requires constant instantaneous response to the performance environment (feedback from physical sensations, extraneous sounds, audience, hall acoustics, the instrument and in particular other ensemble players).</p>	<p>The performance environment remains more or less constant.</p>
<p>During a performance, the solo pianist is the centre of focus, performing under scrutiny.</p>	<p>Ensemble players perform as a musical unit. With the exception of concerto playing and certain accompanying situations, there is no particular focus on any one player.</p>	<p>Apart from lack of audience feedback and "mike-fright", the element of performing under scrutiny is dramatically reduced when compared to a live performance in a concert hall. The recording is a collaboration between the artist, engineer, director and producer. The final take is a consensus decision with "errors" engineered out.</p>

CHAPTER 3: PHYSICAL CHARACTERISTICS OF THE PIANO AND ITS IMPLICATIONS FOR THE SOLO PIANIST

Even a cursory examination of the piano keyboard will confirm why, at the basic level, it is generally regarded as an appropriate (and particularly simple) instrument with which to begin music study. One immediately notices that each of the eighty-eight keys (on a normal sized keyboard) is clearly separated from its neighbour, making visual identification relatively easy. If one decides to carry the examination further by depressing individual keys one after the other (anywhere on the keyboard) one will find that each of these keys is "fixed" in pitch i.e. the pitch cannot be raised or lowered by manipulating the keys. With a little experimentation, it will be clear that the ready identification of pitch position and its fixed nature make it possible for almost anyone to pick out a simple tune by eye as well as by ear.⁷

When, however, one attempts to move on to a more advanced level, performing difficulties directly related to the design of the instrument begin to enter into the learning equation. Indeed, at successive levels of pianistic complexity, these design related difficulties are experienced by the performer as a tug of war, increasingly at odds with the demands of the repertoire. At the

⁷ There is no need for the beginning pianist to "find" the correct pitch or to go through elaborate positional contortions to maintain it — unlike, e.g., a beginning violinist.

virtuoso level, the size of the piano keyboard, its shape, "action", acoustical and other properties (White, 1975) can prove to be a veritable obstacle course blocking many otherwise "promising" pianists from further progress. The web of complex interactions involved in the blocking process taxes the ability of ears — (no matter how sensitive) or muscles (no matter how strong or flexible) to harness the cognitive, physiological, perceptual, aesthetic and overall organizational challenges that the pianist must resolve from moment to moment over extended periods of time (Cohen, 1988).

It is for the above reasons that this chapter will describe in some detail the complex relationship between pianist and piano, with an emphasis on certain technological anomalies that bear directly on the notion of the virtuoso performer. Viewed in its broader social and developmental context, this relationship raises provocative questions about the nature of musical performing abilities and the theories that purport to explain them. It is hoped that by addressing these questions, researchers may derive insights into the performer as artist that have hitherto proved elusive.

I. Standard Keyboard Length and Octave Span

(1) To begin with, pianists of all sizes and ages (from the three-year-old beginner barely able to stretch to an interval of a sixth⁸, to the physically mature

⁸ An interval of a sixth can be gauged by reference to the distance between any six consecutive white keys on the piano keyboard (e.g., from C to A). On

adult with a hand capable of spanning an interval of a ninth or more) are obliged to conform to a standardized keyboard length and octave span that is rigidly uncompromising in design. This fact has contributed to the common perception that individuals with small hands are not born to be concert pianists — a perception that continues to persist despite a long line of distinguished concert artists with exceptionally small hands (notably Josef Hoffman and Alicia de Larrocha) who have achieved eminence in their art.

It is nevertheless true that pianists with small hands are likely to encounter frustrating technical difficulties throughout their careers. Short of giving up hope of ever achieving their artistic goals, most will ultimately resign themselves to performing less demanding works. Others will spend tedious hours engaged in stretching exercises and repetitive drills, a regimen that can prove discouraging — and fruitless — for even the most dedicated musician. We may then ask, what is it about a Hoffman or a de Larrocha that allows these artists to succeed so magnificently despite an apparently prohibitive physiological disadvantage? A further examination of the piano-pianist relationship may offer some clues.

II. The Linear Design of the Keyboard

The traditional linear alignment of the keyboard (parallel to the body

the standard keyboard, the distance will be approximately thirteen centimetres (five inches).

with arms outstretched) is, by any measure, ergonomically primitive. Anything but "user friendly" it imposes physiological constraints on the pianist that are neither conducive to maximum comfort nor efficiency in performance. Indeed, at higher technical levels, it often obliges the pianist to make awkward physical adjustments requiring such great power and speed that her physical resources are taxed to the limit. Two examples should make this clear. In a loud, rapid passage involving repeated leaps to the extremes of the keyboard, the arms must move instantaneously from a contracted to an extended position (i.e. from a relatively secure state of muscular contraction to a weakened state of extension). The resulting strain and fatigue can be further exacerbated if the leaps involve loud, full, five-fingered chords (a not uncommon situation)⁹. Similarly, the rapid crossing and uncrossing of the hands in a changing texture (also not uncommon)¹⁰ can make enormous demands on the pianist's ability to maintain balance, let alone perform accurately. The obvious question follows: is all this effort necessary? A brief sketch of the technological development of the piano provides an interesting, albeit paradoxical clue.

From its invention in the early eighteenth century to the present day, the piano has enjoyed an unprecedented history of continuous technological

⁹ Refer to Scarbo from *Gaspard de la Nuit* by Maurice Ravel and Mazepa (Transcendental Etude) by Franz Liszt.

¹⁰ From Scarlatti sonatas in the eighteenth century to contemporary piano writing of Boulez et al.

innovation (Ehrlich, 1991). Ingenious modifications and improvements in rapidity of touch, depth of tone, power, resonance and durability have kept pace with the technical and aesthetic demands of generations of composers and pianists. The result has been an instrument capable of meeting virtually any musical task, from a simple one line melody that sings, to a massive piling up of sonorities rivalling that of a full orchestra. Yet, while these innovations have brought about vast changes in the internal mechanism of the piano — a modern concert grand has some 12,000 separate parts (Gaines, 1981; White, 1975), the physical design of the keyboard has remained essentially unchanged, other than the extension of range from four octaves in the early eighteenth century to the standard $7 \frac{1}{3}$ octaves in the latter half of the nineteenth century (Cohen & Faulhaber, 1992; Gaines, 1981; White, 1975).

The significance of the paradox here becomes evident when we realize that the technical problems faced by pianists as a consequence of the design of the keyboard have been recognized by builders since the emergence of the great romantic works of the early nineteenth century. Yet, despite considerable industry discussion and the occasional flurry of excitement, every attempt to introduce pianists to ergonomically sensible keyboards has met with failure. Typically the Concave, Clutsam, Janko (Sibyl, 1975) and other innovative keyboards, designed with maximum ease of execution in mind¹¹, were

¹¹ Concave Keyboard: The concave keyboard was first introduced in 1824. It was designed in crescent form to allow the player to maintain the same hand

dismissed by pianists as mere oddities and summarily rejected by piano manufacturers as unmarketable. As a result, pianists to this day continue to wrestle with the enormous technical challenges brought on by an uncompromising keyboard design.

On the evidence, then, one must conclude that rather than adopt an easier technical route to Parnassus, artists would prefer to exercise their skills the hard way. Perhaps the artistic temperament derives part of its inspiration from challenges imposed by restrictions — the more daunting the restrictions appear to be, the better (Cohen, in preparation). Igor Stravinsky, a pianist, and one of the greatest composers of our era, describes his own creative process as follows,

My freedom thus consists in my moving about within the narrow frame that I have assigned myself for each one of my undertakings. ... I shall go even farther: my freedom will be so much the greater and more meaningful the more narrowly I limit my field of action and the more I surround myself with obstacles. Whatever diminishes constraints diminishes strength. The more constraints one imposes, the more one frees one's self of the chains that shackle the spirit. (Stravinsky, 1947, p. 68)

Csikszentmihalyi — albeit from a somewhat more cautious perspective —

position through the compass of the keyboard.

Clutsam Keyboard: Invented by Australian pianist George Clutsam in 1907. Similar to the Concave keyboard, the keys of the Clutsam keyboard radiate in crescent form.

The Janko Keyboard: Invented by Paul von Janko in 1882. Keys were specially arranged in 6 terraced rows, sloping to the front. This gave "equal value to all tonalities". (Sibyl, 1975)

concur with Stravinsky. In his study of the "autotelic"¹² experience of flow, Csikszentmihalyi argues that

Maximum motivation is reached and gratification for accomplishments potentiated when a balance is achieved between our abilities and our responsibilities, when the skills we possess are roughly commensurate with the challenges we face, when our talents are neither underused nor overtaxed." (Csikszentmihalyi, 1988, p. 58)

If this is so, then the hard way, the way of shaping beauty out of a resisting medium may be essential for the virtuoso pianist. Why, he or she may ask, bother with an instrument anyone can play? This possibility raises questions that may go beyond piano performance to the nature of the creative process itself. At the very least, it should help clarify an important distinction between the creative performer and the skilled practitioner.

III. Fixed Height of the Keyboard and Fixed Distance Between the Keyboard and Pedals

In addition to the standardized length and linear design of the keyboard, other ergonomically primitive properties of the piano include (1) the fixed height of the keyboard, and (2) the fixed distance between the keyboard and the pedals.

These standardized properties of piano design are clearly incapable of adapting

¹² The "autotelic experience" or the state of "flow" is a specific experiential state achieved when the individual's skills are in balance with the demands of the task.

to the young pianist's normal growth and stages of physical development. Many pre-adolescents, for example, have difficulty reaching the keyboard and the pedals simultaneously without making awkward postural adjustments¹³. While artificial aids such as raised floor platforms¹⁴ are increasingly being employed, these are far from universal.

IV. Variable Resistance in the Weight of Piano Keys

¹³ These adjustments not only compromise the technical and musical needs of the moment, but may establish counter-productive habits of playing that could prove difficult to eradicate later on.

¹⁴ As background, it may be interesting to note that the raised floor platform is generally built in the form of a height-adjustable foot stool to be placed above the pedals. The use of floor platforms have been documented since the eighteenth century. In Czerny's (1839) treatise on piano playing Opus. 500 Volume 1, with regard to the position of the body and hands, Czerny states that "*... children must place their feet on a foot-stool adapted to their height.*"

A significant limitation of this device is that it prevents the pianist from using the pedals to articulate subtle musical nuances. This limitation immediately becomes apparent in the performance of more advanced repertoires, which, in order to achieve even minimal aesthetic credibility, use of the damper pedal is indispensable.

As a natural progression, a more sophisticated contraption called the "pedal platform" emerged to compensate for the inadequacies of the floor platform. This device has special attachments that connect the "extension pedals" of the platform to the three pedals of the piano, so that the movement of the pedals can be controlled via the extension pedals. In this case, even a young child can reach the pedals comfortably and be able to exploit the wide range of sonorities of the piano. Although the pedal platform appears to offer a better solution than the conventional raised floor platform, it does not seem to be widely adopted.

The weight necessary to produce minimal sound on a modern piano key can range anywhere from two to four ounces depending on the make and model of the instrument.¹⁵ When one compares the light key response (approximately one ounce) and narrow compass of the eighteenth century five-octave keyboard¹⁶ (well within the arm range of an average-sized child) with the much larger and heavier later keyboards, the developmental implications

¹⁵ The late eighteenth century Viennese fortepianos (the piano used by Mozart, Haydn and early Beethoven) required one ounce of weight to produce a sound. Of the pianos produced circa the late nineteenth century, the heaviest key resistance was approximately 4 ounces. In the twentieth century, the average key resistance has been reduced to roughly 2.5 ounces, however wide differences are still the norm. (Gaines, 1981).

¹⁶ It is interesting to consider these factors in the context of well-known examples of gifted solo performers. In his journal (1763) Melchior Grimm notes his impressions on first hearing the young Mozart play. After commenting on the prodigy's outstanding genius and superior training at the hands of his father Leopold Mozart, Grimm continues:

[Mozart], who will be seven years old next February, is such an extraordinary phenomenon that one is hard put to it to believe what one sees with one's eyes and hears with one's ears. It means little for this child to perform with the greatest precision the most difficult pieces, with hands that can hardly stretch a sixth; (Gerig, 1974 p.50)

We may perhaps wonder whether the light key resistance of the harpsichord, clavichord and early Viennese pianos may have contributed to Mozart's prodigious development. The open question is how he might have fared as a virtuoso had he been trained on a modern instrument in a contemporary repertoire?

become immediately apparent. For the young beginner, depressing a sequence of keys on a high resistance keyboard can be extremely tiring, making it all but impossible to negotiate a piece of any length and dynamic range with ease. As a consequence, the choice of an instrument with key resistance compatible with the physique, strength, flexibility and stage of development of the aspiring pianist would seem to be crucial¹⁷. Given the economics involved, this is rarely the case for the piano.

The problems of key action are compounded when the pianist begins to concertize seriously. A concert pianist on tour must be prepared to adjust her technical/musical approach to differences in touch between pianos¹⁸ that are often so marked that any attempt to prepare oneself in advance is futile.¹⁹ Since the question of key resistance can make the difference between a superb or

¹⁷ In the Suzuki Violin Method on the other hand, the youngest students may work themselves up progressively from an instrument that is 1/16 the size of a full violin.

¹⁸ A concert grand piano weighs one thousand or more pounds. While some concert artists (Vladimir Horowitz was a celebrated example) prefer to bring their personal instrument with them on tour, most pianists do not enjoy this luxury, since the transportation of a piano is a cumbersome and costly business. He or she must also contend with equally wide levels of technical expertise on the part of tuners — a potentially serious aspect that a string, wind or percussion player does not have to worry about. Given that these public concerts are often critically reviewed, the issue of portability is far from trivial in any consideration of the "adaptability dimension" of pianistic talent.

¹⁹ Every concert artist has his or her special preference for keyboard resistance. For example, Sviatoslav Richter prefers to play on a heavy action keyboard, while the late Vladimir Horowitz preferred an extremely light action.

mediocre — or for that matter, a passable performance — the issue is far from trivial. As much as heavy key resistance can "dampen" the brisk execution of musical articulations and running scale passages, say, in a Scarlatti sonata, a keyboard with little or uneven resistance can significantly limit the degree of tone control and depth of sonority that the pianist needs to communicate his or her musical intentions. For the artist the solution cannot be found in an adjustment adequate enough to get by, but rather in being able to modify or shape a meaningful alternative spontaneously on an unsympathetic tool.

V. Relationship of the Pianist to the Sound Source

The design of the piano is also unique in the way it obliges the pianist to relate to the source of sound production, that is, to a set of vibrating strings struck by a hammer. Unlike the string, brass or woodwind player who is in direct contact with the sound source, the pianist's fingers remain remote from the vibrating strings. This last point requires some clarification. The piano action consists of a complex system of lever mechanisms. When a key is depressed, the levers cause the felt hammer to hit the strings, thereby producing a sound of particular pitch and amplitude. Since the pianist is physically separated from the hammers and strings, there is a consequent loss of direct physical contact and control over the process of sound generation enjoyed by

most other instrumentalists.²⁰

While it is true that physically the dynamic level of a piano tone cannot be modified by means of touch once the keys have been depressed (Gaines, 1981), many artists claim that they can do precisely this, apparently by timing complex manipulations of the damper pedal to create the auditory illusion of a tone or chord swelling and decaying (crescendo/diminuendo). Some artists claim, as well, that they are able to raise or lower the pitch of a single tone by similar means. A study in progress being conducted in the Leonardo Project suggests there may be some merit to both these claims. Computer analysis of the wave form from a recorded trill performance on the piano²¹ shows that the perceived duration of tone decay and pitch modulation can be achieved by versatile manipulation of the damper pedal. Again, we see here how an artist may conceivably transcend a limitation built into his or her musical instrument by means that are difficult to rationalize purely in terms of aural perception or physical skill.

²⁰ Performers of woodwind, brass or string instruments are in intimate physical contact with the sound source. For example, a flautist holds the entire instrument in her hands, places it against her lips and blows into the mouthpiece. From the first sound, she feels herself to be an integral part of the instrument.

²¹ The trill is taken from concert pianist Anna Szpilberg's performance of Manuel de Falla's *Fantasia Baetica* (measures 196-201) immediately preceding the intermezzo movement. (*Shaping the Invisible: The Leonardo Project. Inside the Body*. Documentary Film, Discovery Channel, Canada. 2nd January, 1995.)

Since the pianist is relatively detached from the sound source, his or her kinaesthetic experience is of a radically different order than that of other instrumentalists. Having to sense and direct multiple levels of moving sounds filtered through a series of wooden levers requires imaginative resources unlike that of any comparable musical activity. Indeed, the integrating powers of imagination and aesthetic sensibility seem more related to the totality of how one senses, hears, adapts to, focuses and controls the flow of music at the piano than to simple musical perception and physical organization. This demonstrates again why generalizations about musical talent — particularly musical performing talent — must take into account the interactive relationship between the performer and the instrument.

Table 2 summarizes the factors which contribute to the separation of the pianist from the sound source.

VI. The Piano as a Stringed-percussion Instrument

As implied in Section V, the piano, by design, is a stringed-percussion instrument — that is, in the act of depressing a key, the pianist releases a series of lever mechanisms that allow a felt-covered hammer to strike a set of strings, thereby producing a sound of fixed pitch and amplitude. Once the hammer strikes the string, there is no way in which the pianist can alter or modify the sound by manipulating the key. The mechanics of key stroke action quite naturally suggest that the piano is a digitally operated instrument best equipped

to perform percussively conceived music.

The percussive nature of the piano is further characterized both musically and visually by the following:

- (1) The separation of individual keys, and the binary coding (black and white) of the keyboard suggest the isolation of tones rather than a flowing, linear musical relationship. In contrast, stringed instruments in which all musical tones fall in a continuum do not suggest a discrete separation.
- (2) The vertical movement of the keys conveys the notion of a non-flowing, or "binary / on-off" technique of performance. Because the vertical action

Table 2.

Relationships of Pianist to the Source of Sound.

(a) The pianist is not in direct contact with the strings (the sound source).

This separation of the pianist from the source of sound can be described as follows:

(i) the pianist is physically detached from the hammers and is obliged to project her intentions by manipulating a complicated series of levers at a distance from the vibrating

strings, which

(ii) in turn activate the hammers which strike the strings

(b) Once a key has been activated, it is impossible to alter its dynamic level.

(c) The pianist must depend on indirect tactile feedback filtered through a performing space that consists of a complex mechanism separating her from the hammer striking the vibrating strings.

is experienced as digital and discontinuous rather than as horizontally flowing, much of piano technique wrestles with a conflict between digital independence and the harmonious integration of musical intention with sound, sense and body. It can be argued that the apparent contradiction between a "digital technique" and "analog" musical motion may be a factor blocking the ability of the pianist to visualize and explore the linear motion that is integral to musical flow.

— (3) The fact that the piano is played from above further reinforces the idea of a vertical attack which disrupts a smoothly flowing musical line. In

contrast, a horizontal flow is implied in the movements in performance of the stringed instruments (e.g. the bow glides smoothly over the strings).

VII. The Piano as a Harmonic Instrument

The essentially harmonic (chordal) nature of the piano's multi-stringed "voice" presents us with a related conflict between a fixed property of the

Table 3.

Percussive Features of the Piano and their Implications for Performance.

Characteristic features of the Piano (as a stringed-percussion instrument)	Implications for Performance	In contrast to other instruments (for example: the violin)
(1) Individual keys are separated in pitch from one another. (Keys also come in either black or white).	Separation of keys suggest the isolation of tones rather than a flowing, linear musical relationship.	There is no discrete separation of musical tones. All musical tones fall on the strings in a continuum.
(2) The digital, vertical movement of the keys conveys the notion of a non-flowing, or "binary / on-off" technique.	(a) Emphasis on the digital independence rather than a harmonious integration of all parts of the body.	(a) Rather than suggesting a percussive attack, a horizontal movement is implied.

	<p>(b) Emphasis on vertical and discontinuous motions rather than a horizontally flowing musical line.</p> <p>(c) Vertical key movements may indirectly suggest a static experience. This may potentially inhibit a performer's ability to visualize the piano's capacity for tone colors in motion.</p>	<p>(b) The performer is always in contact with the strings, therefore is able to make tonal and color adjustments in accordance with one's musical intentions.</p>
<p>(3) The instrument is played from above.</p>	<p>Further reinforces the idea of a vertical attack which may disrupt a smoothly flowing musical line.</p>	<p>Rather than suggesting a percussive attack, a horizontal movement is implied.</p>

instrument and the need to communicate the normal linear flow of music. This conflict becomes particularly acute in the performance of polyphonic²² music (a major staple of the repertoire). Here, the sympathetic vibrations of the piano's strings, uniquely designed to integrate and blend separate musical lines into a vertically experienced whole, present a complex organizational physical challenge to achieving clarity of execution that cannot be easily resolved by practice alone.

VIII. Use of the Pedals

The piano is rich in harmonics (upper sympathetic partials) which are positive integral multiples of the fundamental tone. Its unique qualities of harmonic resonance, amplified and "mixed" when activated, particularly by the damper pedal²³ contributes, more than any other design factor, to its expressive versatility and unsurpassed range of sonorities.

The synchronization of the pedals, however, with the flow of music

²² Polyphony refers to music in which there are two or more parts each having an independent melodic line (These lines may or may not harmonize). By way of comparison, the solo repertoires for woodwind, brass, and string instruments are for the most part confined to single line melodies. (J.S. Bach's keyboard fugues are prime examples of instrumental polyphony.)

²³ The soft (*una corda*) and sustaining (*sostenuto*) pedals have more narrowly specialized functions).

involves an exceptionally high degree of judgement and motor control. At any given moment, one may be articulating between pedals or employing full, half, quarter, eighth, direct, synchronized, or damping pedallings in a variety of combinations. And, most significantly, neither the musical score, nor one's past experience with the piece can be relied upon for guidance. Banowetz (1984) notes that "Pedalling, admittedly, is one of the most difficult aspects in piano playing. Literal adherence to the pedal indications on the text may not always be the best solution." (p. 9). More specifically, there are no ironclad rules for pedalling, no formulae, no prescriptions to follow. Tempo, dynamics, tone color, articulation, balance of parts, the style and the historical period of composition, the particular piano, environmental acoustics, not to say the pianist's overall conception — all these enter into the choice of pedalling at any one moment during a performance.

Technological Development of the Piano and Emergence of the Solo Pianist

As mentioned earlier, since its invention in the early eighteenth century, the piano has undergone a technological development unparalleled in the history of musical instruments. Despite certain characteristic features and anomalies (described in some detail earlier in this chapter) that have prevailed over the centuries, numerous modifications and additions to the instrument (which are still being "improved" upon) have spawned pianos so radically different from each other that it would perhaps be more accurate to speak of a

family of more or less look-a-likes rather than a distinctive instrument that has survived unchanged for over three centuries. (Gaines, 1981). What is most significant for the purpose of this thesis is that the technological developments that have paced the history of the piano and its repertoire can be attributed to the longevity of a remarkable collaboration between builders, composers and pianists — a collaboration that has been a key factor in defining changing musical styles, taste and performing criteria for generations (Gerig, 1974).

To begin with, early pianos, constructed almost entirely of wood, with a pitch range of approximately 4 to 5 octaves,²⁴ were physically smaller and lighter than their modern counterparts. When one compares the sound qualities of these instruments with those of a modern piano, one is immediately struck by the thin tone and markedly weaker powers of projection of the former — qualities that limited their usefulness as solo virtuoso instruments, particularly in a large hall. As a consequence, the eighteenth and early nineteenth century piano most often appeared in an intimate salon setting as either an accompanying or a chamber music ensemble instrument.²⁵ It is important to

²⁴ The piano, which was called a *gravicembalo col piano e forte* was invented by Bartholomew Cristofori (1655-1731) in the early eighteenth century (circa 1709).

²⁵ As Schonberg (1987) notes, "*Early piano performances were generally in a potpourri style. It was customary for the pianist to present his/her own compositions with an orchestra, interspersed with shorter ensembles with other instrumentalists, and concluding with an improvisation*". In this case, competence of the pianist was primarily evaluated on the basis of his/her skills in accompaniment, ensemble playing, composition and improvisation.

note here that it was not until the early nineteenth century that the piano began the transformation from a primarily all-purpose ensemble/accompanying device to a major virtuoso solo instrument for performance in a concert hall. With the improvements in its construction, such as the introduction of the cast iron frame developed by Alpheus Babcock in 1822 (White, 1975) and cross-stringing²⁶ (perfected by Steinway in the late 1850's), the piano's dynamic range and powers of projection were dramatically increased. In addition, by the latter half of the nineteenth century, the seven and one third octave range (88 keys) was finally standardized on most pianos, completing the main features of the contemporary instrument.

It might be useful at this point to expand upon the special relationship that has grown up between pianist and piano as a consequence of this collaboration. This should not only contribute to a better understanding of the qualities that distinguish the virtuoso solo pianist, but should help prepare the way for the related issues that follow. To recapitulate: the process of cross-fertilization has inspired performance practices contingent on technical²⁷ adeptness and creative ingenuity that, by stretching the limits of performance

²⁶ Cross-stringing involves a system of crossing the lower (bass) strings over the higher (treble) strings, producing a much richer palette of overtones than the straight stringing of earlier pianos. (Gaines, 1981).

²⁷ By technical (or technique) I am not only referring to display calisthenics, but to every possible variety and combination of tone control, which, the collaboration suggests may be a bottomless reservoir.

musicianship compels us to reflect on what we mean by pianistic talent. The implications of this become clear when we consider how the coupling of an evolving instrument with dynamic musical, cultural and aesthetic trends fuels a body of practices that has increasingly challenged fundamental notions about musical perception and its role in performance. It is inevitable that a relationship such as this will lead to a new specialization with its own standards of excellence and criteria of talent. In short, what we observe here is an interaction between the environment provided by the piano itself as a physical object and the notion of musical "giftedness" as manifested by the virtuoso pianist. Table 4 summarizes these unique physical characteristics and their implications for the solo pianist.

Even a cursory examination of the chart will reveal contradictions between the design of the piano and certain aesthetic criteria which one normally identifies with the performance of Western art music. Indeed, for at least two hundred years before Bartolomeo Cristofori's invention, instrument builders were attempting to design a keyboard instrument capable of simulating the human voice, i.e. — of producing a "singing" tone. Leonardo da Vinci, in the course of speculating upon and experimenting with new instrumental designs, provided a model sketch for just such an instrument in the early sixteenth century²⁸ (Winternitz, 1990). Attempts to improve the piano's ability to produce

²⁸ Leonardo invented the *viola organista* (a stringed instrument with keyboard), in which *"the strings are set into vibration by a mechanical device — a wheel, a bow with a back-and-forth motion, or a belt of hair moving across the strings as*

a convincing singing (cantabile, legato) tone continue to this day to be the primary occupation of builders (White, 1975). And most telling, the contradiction between the mechanical realities of the piano, and the aesthetic ideals governing its performance — remains a major concern of pianists, pedagogues, performance theorists and analysts (Gerig, 1974).

Characteristics of the Piano	Implications for the Pianist
The linear design of the keyboard, its uniform keyboard size and range.	(1) Poses potential physical problems for the performer. For example: extension and tone control. (2) Assumes that a high level of achievement in performance is independent of age and physical size. (3) Raises the question of the developmental effects of the uniform sized keyboard on aspiring pianists with apparent physical limitations — particularly those of small stature.
Fixed height of the keyboard and fixed distances between keyboard	Pre-adolescent performers often cannot reach the keyboard and pedals simultaneously. This generally

a sort of endless bow. " The viola organista is the first instrument to have a number of strings under the control of ten fingers. (Winternitz, 1990)

Table 4.

Physical Characteristics of the Piano & their Implications for the Solo Pianist.

and pedals.	involves making postural decisions that may technically compromise the performance. ²⁹
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Variable resistances in the weight of keys (varies from 1 to 4 ounces of weight necessary to produce minimal sound).	<p>(1) Practising for a length of time on a fixed resistance instrument may reinforce habits of playing that lack adaptability.</p> <p>(2) A high resistance instrument (heavily weighted keys) may render performance difficult in the formative periods and may contribute to laborious, tiring performance and possible injury — particularly in the unformed pianist.</p>
Separation of the pianist from the sound source (the strings).	(1) Unique to keyboard instruments — and in particular to the piano.

²⁹ Despite devices such as floor platforms and raised pedals, designed to assist individuals who cannot reach both the keyboard and pedals simultaneously. The use of these devices is, in any event, relatively uncommon.

Table 4.

Physical Characteristics of the Piano & their Implications for the Solo Pianist (continued).

	(2) Loss of direct and intimate physical control over the process of sound generation.
The damper pedal and cross stringing.	Provide the pianist with a rich vocabulary of harmonic resonances and upper partials. The control of these harmonies through the damper pedal and finger articulations involves highly complex integration of physical, cognitive, musical and related factors.
The harmonic (chordal) nature of the instrument favours the vertical integration of lines of music.	This presents a challenge for the pianist in the performance of linear, polyphonic compositions and passage work.
Wide variations in "action" and sound quality between pianos.	(1) Obliges the pianist to adapt and make compromises that may affect the communication of her musical intentions. (2) This presents particular problems when one also considers wide differences in acoustical environments.
Lack of portability (An average grand piano can weigh over 1000 pounds).	Unlike other instrumentalists, the pianist cannot physically carry her personal instrument to performances.
The piano is a stringed-percussion	As a whole, these reinforce the idea

Table 4.

Physical Characteristics of the Piano & their Implications for the Solo Pianist (continued).

<p>instrument. This reinforces the idea of percussive attacks:</p> <p>(a) the instrument is normally played from above</p> <p>(b) individual keys are separated in pitch from each other</p> <p>(c) the pianist is separated from the sound source (strings).</p>	<p>of music making as a digital operation involving the hammered action of separate individual strokes, a situation at odds with fundamental aesthetics of a singing (cantabile), and flowingly connected (legato) melodic line.</p> <p>Also poses serious challenges in tone control since the pianist no longer has control of the sound once the hammer has struck the string.</p>
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The Virtuoso Pianist

In a very real sense, the solo piano virtuoso culminates the remarkable longevity of a marriage between technology and a performing art. It is for this reason that the tradition of the solo piano recital is of relatively recent vintage. Indeed, the notion of a pianist performing before an audience alone, and by memory, for upwards of an hour was almost unheard of until Franz Liszt initiated the practice in the mid-nineteenth century (Schonberg, 1987). This, and Clara Schumann's performance of Beethoven's monumental *Appassionata* Sonata from memory — an unheard of feat at the time — set precedents, for better or worse, that have defined the role of the virtuoso soloist to the present day.

Implicit in the new role of the solo concert pianist was the expectation that she play an entire recital, including works of surpassing difficulty, by memory on an instrument that, in itself presents unique musical and physical

challenges. In addition to the requisite musical virtues, the qualities sought for in the new virtuoso were those of a multi-talented super-hero: a prodigious memory embracing intense powers of concentration, physical endurance, flexibility, stamina, charisma, technical acumen, aesthetic insight, imagination, spiritual maturity, originality, daring and resolve.

The artist as super-hero is identified by her unique musical signature³⁰; a distinctive aural quality that cannot be "seen" by reference to the musical score. However its imprint is powerful enough to transfix an audience of thousands for upwards of an hour or two — indeed to remain as a cherished memory long after the event.

³⁰ Consider, for example, the experience of being moved by music, a topic that has occupied performance theorists for generations (C.P.E. Bach, 1753; Gerig, 1974; Mach, 1973, 1980). Most people would probably agree that while the experience of being deeply moved by a musical performance resists analysis, there can be little doubt that a "spellbinding" experience is indeed shared between gifted performers and their audience. The familiar concept of suspension of disbelief extends beyond transforming musical notation from text to sound. Take for instance, the question of producing a singing tone on the piano. How eloquently the pianist shapes tone is more than a matter of her auditory signature, or ability to rise above the constraints of the instrument. What really counts is how the quality of tone contributes to a quasi-shamanistic experience that binds audience and artist in wordless communion. Competent physical execution by itself does not guarantee a stirring performance. Neither can it be explained by simplistic references to abstract musical talent, digital facility or the make of the instrument. The underlying processes are highly complex, blending as they do the individual's biological and mental/aesthetic resources into a remarkably focused — and convincing — whole. How else can one explain how a sequence of discrete tones on a percussive instrument can be experienced by the performer as "*flow[ing] like oil*" (Mozart), or "the piano seemed to be a continuation of my arms"? (Claudio Arrau, in Mach 1980, page 2). The ability to transcend physical limitations through an act of imagination may perhaps be at the core of pianistic talent.

With the advent of the solo virtuoso pianist, improvisation (as spontaneous composition), previously an essential aspect of keyboard musicianship, gave way to the ability to perform a pre-composed score from memory with great flair. This led inevitably to increased specialization, with performers no longer expected to compose, and composers no longer expected to perform. By the early twentieth century, specialization had reached a point where one might question the ability of a musician to demonstrate abilities in areas outside of her chosen field³¹. As the great pianist Arthur Schnabel put it, " Franz Liszt was a creative virtuoso; he composed, he conducted, he taught, he wrote, and he kept in contact with some of the best brains of his generation. ...

³¹ How do we account for the existence of outstanding composers who were uninspiring performers, and first-rate performers who were totally ineffective composers? A classic example is Richard Wagner (1813 - 1883), one of the greatest composers of the nineteenth century. Wagner was an embarrassing pianist despite his monumental composition skills. By the same token, Arnold Schoenberg (1874-1951), the originator of the twelve-tone composition technique, and a major force in twentieth century composition, was restricted to demonstrating at the piano with one finger (as recounted by Nathalie Limonick, Schoenberg's teaching assistant at the University of Southern California). Despite the evidence of his contemporaries and his recordings, the great French composer, Maurice Ravel (1875 - 1937) remains something of an enigma. Ravel has composed some of the most technically and musically challenging works in the piano repertoire, yet his pianistic skills barely allowed him to perform the simplest of his compositions. On the other hand, the great Russian pianist, Sviatoslav Richter (b.1915 -) celebrated for his monumental technique and musical insight, refuses to compose. In his own words, "There are enough inferior composers around."

Though we may consider that Richter's interest may not lie in composition, as Schoenberg and Wagner and Ravel's were not in performance, we cannot exclude the possibility that musical giftedness is neither an "all-or-none" trait, nor a general attribute that extends across all areas of musical expertise.

The virtuoso of today does not correspond to the Franz Liszt type. Our keyboard and string virtuosos do not, as a rule, either compose, or teach, or conduct, or write, or meet each other or equals in other fields." (Schnabel, 1988, p. 148).

On the face of it, any one of these factors would contribute to an exponential increase in performance anxiety for a pianist contemplating a solo career. The mere fact of being judged on intangibles such as one's originality and character, let alone showmanship, charisma, and the other "essential" attributes should be enough to give an aspiring soloist second thoughts. The intriguing question here is why, despite the evidence, so many artists feel compelled to face the challenge presented by this complex web of intangibles (Cohen, 1992).

Physical Characteristics of the Piano and the Pianist: Obstacle or Challenge?

We have argued that a clue to the nature of virtuoso pianism may be found in the way one perceives one's physical relationship to the instrument. This is particularly so when received wisdom, authority and common sense conspire to convince us the problems that must be faced may prove to be insurmountable. The normal response, for example, to the self-evident fact of one's tiny hands, weak fingers and chronic stage-fright would be to abandon one's dream of becoming a concert pianist. However, an intrinsically motivated individual (Csikszentmihalyi, 1987) might perceive the "insurmountable" obstacles to a career as an exciting — even enjoyable — challenge to be

overcome.

The problem, of course, is that intrinsic motivation may be insufficient or even counter-productive. For example, an over zealous, immature pianist might easily over-exert or injure herself. By the same token, the developmental process may be approached unrealistically through poor practice habits, or premature attempts at technically demanding repertoire — tendencies not uncommon even among the most celebrated pianists. Artist-teacher Leon Fleisher, explains how he permanently lamed a finger in his right hand, "I'm quite clear how this happened to me: I practised stupidly for many years. One of the main reasons was that, at that time, the macho idea of practising through pain was very popular ..." (Attinello, 1993, p. 31).

It is not uncommon for ambitious teacher/advisors to recommend "quickie" solutions that can prove dangerous to the health of the developing pianist. An experience of my own may serve to illustrate the potential consequences of one such solution.

My first piano teacher, advised my parents to have my tiny hands surgically enlarged. I was six years old at the time. While I could play very musically, my hands could barely reach an interval of a sixth. My teacher's rationale for this abomination was that a simple surgical incision between the thumb and index finger would extend my hand to a full octave range, thereby setting me on the road to artistic stardom. My parents fortunately remained unconvinced and let nature take its course.

During my undergraduate years, another teacher put it bluntly: " Face it! You have small hands and you'll never be able to play the 'big' stuff. Get any ideas of playing Liszt, Rachmaninoff, Scriabin and Tchaikovsky — all the big stuff — out of your little head. Be content with playing simpler pieces like the easier Mozart and Haydn sonatas."

My experience is far from unique. In a recent documentary film³² the Polish-Canadian concert pianist Anna Szpilberg describes how one of her first piano teachers advised her to give up all thought of a career as a pianist, and switch to the harpsichord (a lighter action, smaller compass instrument with a different repertoire). The reason given: despite her evident musicality, Anna Szpilberg's hands were too small. The effects of advice such as this coming from an authority figure responsible for directing one's future, can permanently devastate the resolve of even the most intrinsically motivated young pianist.

As we have demonstrated repeatedly throughout this thesis, the solo virtuoso pianist develops and performs in a dynamically interactive environment. To begin with, it is clear that there are physical challenges intrinsic to the piano - pianist relationship that are not encountered in most other instruments. This in itself would seem to require a consideration of domain specificity, whatever the conceptual framework of giftedness may be. When we consider the input of parents, teachers and other key authority

³² *Shaping the Invisible*. (Part 1 of the documentary series Inside the Body) The Discovery Channel, Canada. 2nd January, 1995.

figures, singly and collectively, the complex nature of the gift and its exercise becomes more apparent. This would suggest that the ability of the pianist to successfully exploit the affordances of her environment is a measure of her creative potential. We must then conclude that an investigation into the creative processes involved is imperative to an understanding of pianistic giftedness.

CHAPTER 4: CONCEPT OF THE GIFTED SOLO PIANIST

In the previous chapter, we examined the relationship between the pianist and the contemporary piano, with a particular emphasis on certain physiological and related demands imposed by the instrument upon the pianist aspiring to a career as a solo virtuoso. We have argued that these demands strongly suggest that virtuoso pianism is a highly specialized creative endeavour involving factors independent of those subsumed under most current theories of musical giftedness.

The aim of this chapter is to clarify the relevance of current concepts of musical giftedness as they apply to the solo concert pianist. In the process, I will (a) critically review the nature of selected studies from the psychological, education and pedagogical literatures, (b) examine the assumptions underlying these studies, and (c) discuss their implications for our understanding of

"pianistic giftedness". In particular, I will draw attention to problems that arise when we attempt to arrive at a consensus on whether and how these assumptions may provide insights into musical giftedness in the solo concert pianist.

Studies of Giftedness

Scientific studies on the question of musically gifted individuals have been conducted from a variety of perspectives. For purposes of this investigation, these studies, conducted for the most part by psychologists, educators, and performance theorists fall generally into the following categories, with considerable overlap:

questionnaire (Csikszentmihalyi, 1993); interview (Manturzewska, 1990; Sloboda & Howe, 1991; Sosniak, 1985); longitudinal (Csikszentmihalyi, 1993; Feldman, 1986; Revesz, 1935); experimental (Freeman, 1974), neuropsychological (Charness, 1988; Judd, 1988); cognitive (Bamberger, 1986; Csikszentmihalyi, 1993; Gardner, 1993; Shuter-Dyson, 1985); educational (Bloom, 1985; Horak, 1981); theoretical (Renzulli, 1986; Tannenbaum, 1986); bibliographical (Alink, 1993; Fisher, 1973; Loesser, 1954; Schonberg, 1983; Weisberg, 1992); experiential studies (Csikszentmihalyi, 1993); musical ability tests (Gordon, 1976; Seashore, 1939; Wing, 1962); and measures of musical performance (Farnum, 1969; Watkins & Farnum, 1954, 1962). For a tabulated listing of relevant studies, please refer to Table 5.

For the most part, the current literature defines musical giftedness in terms of general musical competence. The relationship between musical giftedness and personal characteristics including factors like intrinsic motivation, concentration (Csikszentmihalyi, 1993), the significance of the physical and cultural environment (Horak, 1981; Manturzevska, 1990), the influence of parents, teachers, schools, musical institutions and competitions on the developing individual (Alink, 1993; Bloom, 1985; Feldman, 1986; Sosniak, 1985) have been extensively investigated. In addition to these studies, a number of musical ability tests which purport to identify musically gifted individuals by measuring perceptual acuity have been devised (Gordon, 1976; Seashore, 1929; Wing, 1962). With few exceptions, these studies and tests do not distinguish between various manifestations of musical ability, notably composition and performance. Neither do they address the specific characteristics of highly specialized disciplines such as virtuoso pianism in anything but a cursory manner. They tend, rather to treat musical ability as an all embracing trait — with the unfortunate consequence that a substantial body of literature exists that confines for the most part, to aspects of musical competence that are difficult to reconcile with the reality of the musical performing experience. In the case of the solo (virtuoso) concert pianist, we find a notable absence of studies that address the multiplicity of variables and their interaction which constitute technical and musical competence. The handful of investigations on the solo concert pianist that have emerged are not only of

limited scope but are, notable for their absence of follow up research. In this regard, while individual studies have been conducted by musicians, psychologists, sociologists and educators, few show evidence of interdisciplinary co-operation — a curious state of affairs when one considers the multi-faceted nature of musical experience.

Towards a Definition of "Musical Giftedness"

As was noted earlier, the question of musical giftedness has remained elusive despite years of speculation by musicians, educators, philosophers and scientists. Over the past several decades, there has been a marked upsurge of interest by researchers attempting to come to grips with the problems of identifying, classifying and evaluating musical abilities. Here, we will continue

Type of Study	Author	Topic of study
1. Interview - Biographical Studies	Manturzevska (1990) Sosniak (1985)	A study of the life course of professional musicians; and the factors influencing their development and achievement. The roles of the home, teachers, school and other factors that affect the development of high levels of competence in

Studies Relevant to "Musical Giftedness".

	Sloboda & Howe (1991)	concert pianists. An examination of the backgrounds of promising student musicians and how they successfully progress towards high levels of competence.
	Freeman (1984)	An examination of the relationship between aesthetic development in fine arts (music and visual arts), family encouragement and financial support in 24 English children enrolled in a primary school.

Type of Study	Author	Topic of study
2. Questionnaire	Csikszentmihalyi (1993)	The significance of intrinsic rewards in the attainment of high level achievement of 120 talented teen-agers.
3. Longitudinal - Case Studies	Revesz (1925)	6 year study covering the formative years of piano prodigy Erwin Nyiregyházi.

Table 5.
Studies Relevant to "Musical Giftedness" (continued).

	Feldman (1986)	2 year study following the development and ultimate decision to specialize in composition by violinist Nils Kirkendahl (pseudonym).
	Csikszentmihalyi (1993)	Study on the long term benefits of positive experience in the development of jazz saxophonist Ron Schwartz.
4. Experimental	Freeman (1974)	(a) The initial contact with music and graphic art, and (b) how outstanding children differ from their peers.
	Miller (1987)	A 7-year-old mono-savant's sensitivity to various dimensions of musical structures in simple melodic patterns.
5. Neuropsychological	Charness (1988)	Suggestion of a framework for examining expert performance in domains requiring an extensive knowledge base for superior performance (e.g. chess, music).

Table 5.
Studies Relevant to "Musical Giftedness" (continued).

	Judd (1988)	Examination of the critical and peripheral componential skills involved in performing various musical tasks.
6. Cognitive (Psychology of the creative process) - Observational Study - Experimental Study	Bamberger (1986)	Cognitive re-organization of musical representations of pre-adolescent violinists.
	Csikszentmihalyi (1993)	Identification of musical talent, its characteristics and environmental influences on its development.
	Shuter-Dyson (1985)	A study of the nature of musical talent, personality structure of musicians and its relationship to other intellectual abilities.
	Palmer (1992)	Explores the ways performing pianists interpret a score and indicates that timing is an important variable for understanding communicative expression in music.
	Shaffer (1992)	Studies the relationship between expressive timing

Table 5.
Studies Relevant to "Musical Giftedness" (continued).

		and musical interpretation in piano performance.
<p>7. Education</p> <p>I. Theoretical Models of Intelligence</p>	<p>Gardner (1993)</p> <p>Clarke (1992)</p> <p>Renzulli (1986)</p> <p>Tannenbaum (1986)</p>	<p>The theory of Multiple Intelligences: i.e. that human intelligence can be broadly classified into 7 relatively distinct categories: i.e. musical, bodily-kinaesthetic, logical-mathematical, linguistic, spatial, intrapersonal and interpersonal.</p> <p>Identification of gifted performers in the visual and performing arts.</p> <p>The "three-ring" conception of giftedness: (a) above average ability, (b) creativity and (c) task commitment.</p> <p>Giftedness as a social construct. Classified into 4 sub-categories in order of prevalence: (a) scarcity, (b) surplus, (c) quota, and (d) anomalous talent.</p>

Table 5.
Studies Relevant to "Musical Giftedness" (continued).

	Monsaas & Engelhard (1990)	relationship between home environment and competitiveness. Subjects were selected from four unrelated domains: award-winning concert pianist, world-class tennis players, Olympic swimmers and eminent research mathematicians.
9. Bibliography	Loesser (1954)	Gender relationships in the evolution of the piano and its performing styles.
	Schonberg (1987)	A distinguished critic examines the socio-cultural and philosophical background of eminent pianists through history.
	Gerig (1974)	A critical examination of the evolution of piano techniques.
	Fisher (1973)	A historical overview of the lives, careers and personalities of musical prodigies (ranging from J.S. Bach to contemporary jazz artists).
10. Experiential Account	Csikszentmihalyi (1993)	A comparative study of

Table 5.
Studies Relevant to "Musical Giftedness" (continued).

		academically gifted and "non-gifted" students. The study focuses on intrinsic motivation.
11. Musical Ability Tests	Seashore (1939)	Measures of Musical Talent
	Wing (1936, 1962)	Musical abilities in school children (1936) Standardized tests of musical intelligence (1962)
	Gordon (1976)	Tonal and rhythmic pattern discrimination.
12. Musical Performance Tests	Watkins & Farnum (1954;1962)	Scale of performance accuracy (for wind and snare drum players).
	Farnum (1969)	Scale of performance accuracy (for orchestral stringed instrumentalists).

our critical examination of the most influential of these studies from an interdisciplinary perspective — one that acknowledges the developmental realities of the solo concert pianist.

As I have intimated throughout, the psychological and educational

literatures pose serious questions as to whether this issue has been adequately addressed. To begin with, there seems to be a lack of consensus among researchers about the population to be studied, let alone evaluated. Some idea of the distribution of subjects selected by various researchers can be gauged from below:

- (1) Pre-teen children who demonstrate unusual ability in music performance and/or composition. Note: one child in each of the following studies. (Revesz, 1925; Feldman, 1986)
- (2) Children admitted to a school for the "musically gifted" on the basis of informal tests of general musical aptitude. The selection procedure for entry into the school is based on informal assessment of musicianship, aural awareness, creativity, musicality, technique, literacy and musical personality. These evaluation criteria are loosely described rather than defined. As a consequence they are as elusive in themselves as the term "musical gifted". (Sloboda, 1991).
- (3) Mono-savants, capable of reproducing a piece of music on an instrument after a single hearing, with fair digital accuracy but limited or non-existent expression. (Bergman & Depue, 1986; Miller, 1987; Sloboda, 1985; Treffert, 1989)
- (4) Career professional performers (ensemble instrumentalists) predominantly from families with a musical tradition. (Manturzevska, 1990)
- (5) Celebrated winners, runners-up³³, and losers in international (solo) piano competitions. (Alink, 1991; Monsaas & Engelhard, 1990; Sosniak, 1985)

³³ Finalists in one of six following international piano competitions (Chopin, Leventritt, Leeds, Queen Elizabeth of Belgium, Tchaikovsky, and Van Cliburn.)

Taken with the studies listed on Table 5 the above suggests the following questions:

- (1) What, if any, are the evaluative criteria shared (or generally employed) by these researchers? On what basis do these criteria distinguish the musically gifted from the general population? In what ways (if at all) and to what degree do these criteria apply to the solo virtuoso pianist ?
- (2) What, if any, are the assumptions underlying these criteria? Are these shared by all current researchers?
- (3) If shared, how do these assumptions enter into the methodological process in studies relating to virtuoso pianism? If not shared, what are the implications of these differences?

When examining the above in the context of the present study, the most consistently striking fact that presents itself (with the possible exceptions of Judd and Sosniak) is how few scientific studies have hitherto made any clear-cut distinctions between the performer, the composer, and the musically perceiving listener. In short, giftedness has most often been treated as an all-embracing ability identified by facility in aural perception. We must assume then, that this focus indicates both a shared assumption and a governing factor in the design of evaluative criteria — independent of the aim of a particular study or its population. That this is not only naive but potentially counter-productive as a basis for developing an understanding of virtuoso pianism, has

been the primary aim of this thesis. A brief review of specific studies may serve to illustrate this observation.

In Sloboda and Howe's (1991) study of the musical life of forty-two children prior to acceptance in a music school for the gifted, the authors do not identify

[a] the specific musical focus of each child, that is, his or her main instrument or voice

[b] a second instrument or voice (if any)

[c] other musical interests or activities, e.g. composition.

There is, as a consequence, no indication of involvement or general competence in music of these children to support a global concept of musical giftedness.

Neither is there any distinction made in competence between areas e.g. piano and trumpet. As noted earlier (see table 5 and above) admission to the music school was based on informal assessment of six general qualities.

In another study, Sloboda (1991) commenting on representative studies on general musical ability (e.g. sight-reading skill), concludes that "every member of a culture is a musical expert, but the expertise is usually hidden and tacit. It may not exhibit itself in the ability to sing or play." Sloboda continues on to focus on the perception of musical structures (e.g. aural discrimination of melodic sequences) and goes into great detail describing similarities between musicians and non-musicians in ability to recall excerpts heard. His frame of reference, as a consequence does not identify characteristics unique to high level

performers that can tell us how and why they are able to perform as well as they do — in addition to, and apart from — listening ability.

In Gardner's (1993) discussion of musical talent, there are only superficial and rudimentary distinctions made between musical performance and perception. For example, in his "musical production activity", Gardner confines himself, for the most part, to an assessment of the child's ability to sing a song in pitch and rhythm. The "musical perception activity" on the other hand, assesses the child's ability to discriminate pitch through activities such as the recognition of a song and the detection of errors. In neither case is there any indication of how these activities qualify as reliable predictors of performance potential.

As we have noted earlier, it is of paramount importance for us to consider the calibre of achieved performance at every level in the development of the apparently gifted individual. This presents problems when we realize that the term "musically gifted" is applied equally to a recognized prodigy (Revesz, 1925; Feldman, 1985), mono-savants (Treffert, 1989; Bergman and DePue, 1986) who can barely feed themselves but can play a few tunes from memory, to informally tested children designated as "musically gifted" (Bamberger, 1986; Sloboda & Howe, 1991), and to finalists in international piano contests (Sosniak, 1985). In effect, the distinction between the prodigiously successful performer and the marginally competent becomes nebulous. Clearly, the term "musically gifted" is neither an equal opportunity gift nor is it a gift unsullied by

circumstances. Seen from this perspective, the mono-savant's apparent "gifts" would relate more to the demonstration of a quality that exceeds our normal expectations of one who is otherwise disadvantaged. (The quality itself seems to be a function of specific areas of the brain that may be involved in music making but do not comprise all the factors that identify the gifted musical performer.) This becomes evident when we realize that neither the level nor the quality of a mono-savant's performance will improve over time — indeed it is unlikely that it will show any evidence of development. Clearly, the facility displayed by a mono-savant is not equivalent to that of the high-order musical and aesthetic development evident in the performance of a virtuoso pianist. We must then question whether proficiency, however modest, should be considered a gift, since the level of accomplishment relative to both the normal and expert population has become secondary.³⁴

³⁴ I once had the opportunity to listen to a mono-savant who had been exhibited as "an extraordinary musical talent (one who also improvises)". This intellectually challenged, nine-year-old girl performed a simple Bach minuet and Beethoven's Für Elise by memory on the piano. After listening to her performance, I agreed that this was certainly a remarkable accomplishment when one considers the child's limited abilities in other spheres. However, calling her "an extraordinary musical talent" is certainly an overstatement. The performance was mechanical and unmusical. Pieces were played through (with rhythmic inaccuracies, and occasional incorrect notes) without the slightest musical expression — no variations in dynamics, tone colour, or mood. Her "improvisation" on familiar tunes were harmonized with the most basic chord progressions in simple keys. Again, incorrect harmonies were often used. On the positive side, she seemed to derive enormous pleasure banging away mercilessly on the keys. By even the most generous criteria, however, her performance would have to be considered mediocre at best.

On the other hand, we could argue that an otherwise normal individual living in an environment not particularly conducive to fostering outstanding achievement but who nevertheless demonstrates a certain capacity could also be designated as "endowed" with a gift for music. For instance, a nine-year-old child, who, with minimal instruction is capable of giving even a passable rendition of Chopin's *Fantasia-Impromptu* from memory, is clearly a significant achiever. Though the performance may not be comparable to that of a Juilliard graduate, it would undeniably be outstanding in its own right. Similarly, a late-achiever who had not "arrived" via the prodigy route, yet could perform Ravel's monumentally difficult "*Gaspard de la Nuit*" with exquisite sensitivity and technical control would qualify as a gifted virtuoso pianist.

The Piano Competition

In recent years, piano competitions³⁵ have helped launch the careers of a number of celebrated artists. In the process, competitions have become a generally accepted evaluation standard for pianistic giftedness. This last point, however, needs to be qualified.

³⁵ The first formal piano competition took place in 1892. Prior to this, most "competitions" were in the form of rivalry — amicable or otherwise — between established, often eminent composer/pianists who exchanged improvisations on given themes. The contest was not a career move, but rather an opportunity for the best artists to "play off" each other, e.g. Mozart / Clementi, Beethoven / Wolff and Liszt / Thalberg. (Alink, 1992; Cohen and Faulhaber, 1992)

To begin with, we must ask whether a performer's standing in a competition (e.g. first prize, finalist, semi-finalist etc.) is a reliable measure of future artistic success (Alink, 1992). Alink's findings — distilled from a comparative examination of major national and international competitions from 1892 to 1988 — are instructive here. The examination compares competition objectives; acceptance criteria; contestant and juror profiles; adjudication criteria; decision making procedures and most significant, the relationship between a contestant's final standing(s) and her subsequent career. On the latter point, Alink found that many winners and finalists did indeed continue on to high profile careers.³⁶ However, so did many semi-finalists and outright losers who achieved eminence and became household names.³⁷ Most interesting is the fact that some of the most illustrious virtuoso pianists of our century never competed.³⁸

In his discussion of "irregularities" in juror profiles and their effect on the decision making process, Alink notes items such as the complaint that "*many of the contestants who did pass had their teacher on the jury*" or the "*possible influence of politics, relationships or even bribery on the jury's verdict*" (Alink, p.7). These, taken

³⁶ Claudio Arrau, Emil Gilels, Michelangeli, Van Cliburn, Maurizio Pollini (Alink, 1993).

³⁷ Arthur Rubinstein, Paul Badura-Skoda, Peter Frankl, and Tamas Vasary (Alink, 1993).

³⁸ Rachmaninoff, Cortot, Horowitz, Serkin, Richter, and Kissin.

with similar instances and the mixed results of the contests, have persuaded Alink to concur with Badura-Skoda (1987) that piano competitions are "not to be taken seriously".

Perceiving Giftedness: Constraining Factors

The following is intended to illustrate the range of possible constraining factors that may enter into a researcher's perception of pianistic giftedness:

- (1) Social, cultural values and influences, such as: gender bias, late-bloomers;
- (2) Pedagogical assumptions and considerations, such as: musical ability as an innate gift, an ideal chronological age, speed of acquisition of performing skills, dependence on innate intellectual abilities, environmental affordances (Segalowitz, in preparation; forthcoming; Segalowitz & Abrahamowicz, 1992);
- (3) Evaluation procedures, such as: standardized tests purporting to measure musical abilities, piano examinations, auditions, competitions, admission into musical institutions.

These factors will now be elaborated upon.

I. Social and Cultural Influences

I have attempted throughout this thesis to show how the phenomenon of virtuoso pianism cannot be separated, even for purposes of discussion, from its social and cultural influences. As in any other socio-cultural environment, prejudices and stereotypes can profoundly affect the course of a particular

individual's development as well as the perception of their "gifts" — acquired or otherwise.

Gender bias is no exception to the ingrained prejudices that limit the virtuoso development of women pianists. The most celebrated examples are of course, Nannerl Mozart (sister of Wolfgang Amadeus Mozart) and Fanny Mendelssohn (sister of Felix Mendelssohn). It is also interesting to note that, of the 58 professional musicians of the various generations in the Bach family, virtually none were women (with the possible exception of Anna Magdalena Bach). It is an open question whether J. S. Bach's daughters (of the twenty children he sired) were by nature less musically capable than their brothers, given the fact that all the children were presumably brought up under a musically inspiring environment. The Bach family is not unique in this respect. One would be hard put to find outstanding female composers / performers from any family before the nineteenth century no matter how musically distinguished the family was.

However, this is not to say that women were denied the opportunity to learn to play the piano. On the contrary, it seems that the ladies were destined to play the piano as a culturally desired pastime, or more to the point, as a lure in the more practical game of snaring a suitable husband³⁹ (Loesser, 1954;

³⁹ It was believed that a woman who plays the piano would provide musical entertainment for house guests and would therefore be considered a better hostess.

Gaines, 1981). Women pianists, as a consequence, were rarely encouraged to develop their abilities beyond the dilettante level. And those who persisted in establishing a career and may even have achieved a degree of celebrity generally encountered formidable road blocks on the way to the top.

Clara Schumann (1819-1896), Teresa Carreño (1853-1917), Myra Hess (1890-1965) and others may have been remarkably brilliant pianists and may have toured widely, yet none were considered by reviewers or the public as the virtuoso equals of their male counterparts. In our own century, others such as Marguerite Long, Rosina Lhevinne, Annette Essipoff, and Yvonne Hubert settled for renown as piano pedagogues. While questions about whether women have the physical, let alone emotional stamina to handle the challenges presented by the virtuoso repertoire are still heard on occasion, over the past thirty years, a growing number of women pianists, notably Alicia de Larrocha (1923 -) and Martha Argerich (1941-) have achieved Horowitzian stature in the public eye. While complete acceptance is still some distance away, women for the first time in history are playing virtuoso masterpieces tailored for the man with muscles and confidence.⁴⁰

⁴⁰ Even in the relatively open jazz society, where women singers are accepted as creative equals to men, prejudice against their role as pianists still prevails. This is perhaps due to the early association of jazz pianists with brothels. Therefore, women pianists have traditionally a difficult time establishing major reputations for themselves. (Cohen, 1994).

It is interesting to note here that in traditional Ethiopian culture, pianists, regardless of gender, are stigmatized as outcasts — since the piano is considered

It is therefore evident that related social and cultural assumptions play a significant role in acting as a powerful selective force in a particular culture and as a consequence may impose relentless constraints on the potential of the pianist in achieving a high degree of proficiency.

II. Pedagogical Assumptions and Considerations

Two inter-related and generally unchallenged pedagogical assumptions seem to be central to theories of musical giftedness and its development. The first assumes that pianistic accomplishment is a consequence of a genetic musical predisposition. This predisposition blends specific physical attributes (e.g. size and flexibility of the hands) with acute aural perceptual ability (i.e. hearing). The second is that "giftedness" seen from this perspective is an independently stable characteristic. One may therefore conclude that individuals who demonstrate exceptional promise at an early age will naturally develop into excellent pianists.

Historically, these premises have generally been supported without question by some of the most distinguished concert pianists and pedagogues over the past two centuries (ranging from C.P.E. Bach in the eighteenth century, to Franz Liszt, Arthur Schnabel, and others). Evidence supporting the notion of

to be a foreign musical instrument. (Franzel, 1994).

innate predisposition as a predictor of success in musical performance has focused almost entirely on exceptional early promise (Fisher, 1973; Manturzevska, 1979; Revesz, 1953; Scheinfeld, 1956).

The case is closed if we accept the premise that giftedness is a "pure", immediately recognizable indicator of a player's potential — we are in effect excluding all those who do not easily rise to the occasion at the "appropriate age" and stage. At best these individuals will be written off as "limited" or "moderately gifted" talents. They may, as a consequence, find themselves deprived of developmental opportunities capable of helping them realize their potential to the fullest.

The implication of this has been recognized by Sosniak. As previously noted, her study (1985) of twenty-four finalists in international piano competitions under the age of forty, shows that even though these individuals demonstrate an affinity for music at an early age, their "talents" were by no means prodigious — they were, perhaps only considered to be outstanding neophytes when compared with children of the same age in the neighbourhood. In a similar vein, prior to commencing his studies with Leschetizsky at the age of 23, Paderewski was, by all accounts, a mediocre pianist (Schonberg, 1987). Sviatoslav Richter did not "bloom" until his twenties when his "hands were freed" by his teacher Heinrich Neuhaus (Schonberg, 1987), while Alfred Brendel admits that he was not a child prodigy. Even more dramatic is the case of Vladimir Leyetchkiss who did not begin the serious study

of the piano until the age of forty (Cohen, in preparation). This, therefore calls into question the stereotype that prodigiousness is an essential pre-requisite for high level pianistic achievement.⁴¹

More importantly, questions are being raised as to whether precocious manifestation of pianistic talent guarantees subsequent accomplishment or recognition. Although no systematic studies have hitherto been conducted on the development of prodigious pianists, there is sufficient documented evidence of adolescent decline (Bamberger, 1982; Feldman, 1991; Winn, 1979) to challenge the premise that precocity is a reliable predictor of subsequent achievement, or for that matter, is a positive indicator of musical potential. Recognising that giftedness is a variable and a function of time, educator / philosopher Israel Scheffler (1985) states that

" Possession as well as realization [of human potential] may, in other words, vary over time. A student now possessed of a given potential may or may not realize it in the future; but, also, a student now lacking such a potential may or may not come to possess it later on." (p. 10)

From a related perspective, as mentioned earlier, Bamberger (1986) has shown that during the adolescent phase, a musical prodigy may go through a period of self-examination with a consequent restructuring of her career goals. She attributes this search to a perceived loss of one's ability to maintain the ease

⁴¹ Rachmaninoff is often cited as a "late-blooming" pianist who did not begin his career as a virtuoso until the age of forty-five. However, he was known as a highly accomplished pianist as well as composer well before that age.

of execution that formerly served one so well. According to Bamberger, as prodigiously outstanding musicians approach adolescence, they begin to experience difficulties in performing and may encounter serious obstacles in the course of their careers. During this transitional phase, these musicians become so self-conscious of their performance that they begin to consider the various dimensions of music separately. The once well integrated musical components are teased apart and agonized over interminably. Unless they succeed in the "*cognitive re-organization*" of their musical perception, their "gifts" are likely to falter. Bamberger, describes this career crisis as a "mid-life crisis" — a block that seems to afflict the majority of ex-prodigies between the ages of nineteen and twenty-one. This is a period of "cognitive re-organization in their musical development" — i.e. they are reconsidering the whole matter. The unstable emotional climate within the performer, according to Bamberger, is probably exacerbated by the clash of normal developmental growth with an inner need to reflect and take stock. Essentially, the musical resolution of the crisis begins to take shape when a cognitive re-organization of one's resources becomes a mature reality.

Consistent with Bamberger's observations, the celebrated Chilean pianist, Claudio Arrau (1903-1991) disclosed in an interview that at the age of eighteen or nineteen, he underwent psychiatric treatment as a consequence of an emotional block that prevented him from expressing himself musically (Mach, 1980).

Another case in point is that of the Hungarian pianist, Erwin Nyireghazi portrayed in the 1920's as "the greatest musical prodigy since Mozart". According to Revesz (1925), Nyireghazi was already an outstanding pianist and composer at the age of seven. Listeners were impressed not only by his impeccable technique, but also by the unique musical quality of his interpretations. Nevertheless, with the exception of occasional performances and a few recordings, Nyireghazi's performing career, for all intents and purposes, ended in his early twenties. Suffering from severe performance anxiety, he spent most of his remaining years living in poverty and seclusion with few performances and without a piano of his own.

It would therefore seem that the demonstration of prodigious skill at an early age is not, in itself, a reliable indicator, or for that matter, the only predictor of subsequent pianistic achievement. It may perhaps be more useful to consider whether the exhibition of pianistic talent is the result of a pattern of specific circumstances converging at a particular time in the individual's life. If so, what are these critical factors and how do they interact?

As indicated previously, Feldman (1991) proceeding from a global perspective, identifies at least four different time frames which he argues must converge for prodigious talent to manifest itself. These four time frames include (1) the individual's life span; (2) the developmental history of the field or domain; (3) cultural and historical trends that bear on the individuals and their corresponding fields; and (4) evolutionary time. Sosniak (1990), while focusing

entirely on pianists, concurs with Feldman by proposing that outstanding pianistic talent should be examined in the light of the educational, environmental and experiential factors that shape the individual's development. In sum, the postulates of both Feldman and Sosniak suggest that studies focusing on various interactive factors and their developmental stages will provide a more comprehensive framework for the understanding of the nature of virtuoso pianism than is presently available.

III. Evaluation Procedures

As noted previously, a substantial number of well-established and periodically updated tests have been developed which purport to assess musical abilities (Bentley, 1966; Gordon, 1976; Kwalwasser & Dykema, 1930; Seashore, 1939; Wing, 1962). As in most of the other studies we have examined, these, do not address any particular musical discipline. As a consequence, none concern themselves with the specific nature, the conditions of development or the potential of the aspiring solo virtuoso pianist. However, since these tests are used extensively as evaluative tools, it is important that we review their premises and methodological procedures. This should help clarify their value and limitations in the context of this thesis.

To begin with, there are three inter-related assumptions governing the evaluative criteria employed in these tests:

(1) The ability to deal with musical material — whatever the sub-discipline — is

largely innate.

(2) This innate musicality can be identified and its developmental potential predicted through tests that rely almost entirely on measures of auditory discrimination.

(3) The tests are designed to exclude aesthetic, affective, creative and organizational considerations that are specific to any sub-discipline of music.

The limitations of these assumptions become immediately apparent when they are used as the *sole predictor* of future accomplishment in musical performance, independent of instrument and related developmental factors.

Note for example the following:

Most tests focus on the ability to *detect* differences between isolated tones and/or simple melodic fragments. They do not, however, deal with the ability to *execute complex works over a sustained period of time*. At best, they identify auditory discrimination at an elementary level which tells us little, if anything, of the individual's ability to reach an advanced level of pianism. This last point is particularly relevant since the tests, for the most part, fail to distinguish empirically between trained musicians and individuals without prior musical knowledge.

The most striking deficiency, however, in these tests as predictors of future accomplishment is the absence of aesthetic and musical content. Seashore's Tests of Musical Ability (1919), the most respected and widely used measure of auditory discrimination, is a case in point. To begin with, Seashore

relies on beeps generated from an oscillator rather than excerpts sung or performed on a musical instrument. Most significantly, musical content is deliberately excluded in the interest of "objectivity". In the few tests where musical instruments are used (Gordon, 1965; Wing, 1961), only short, simple melodic fragments or elementary harmonic structures are presented in rudimentary permutations.⁴² Here again, the focus is on identification rather than execution.

In an early attempt to measure execution, Seashore (1919) graphically demonstrates the underlying problem inherent in studies purporting to measure musical performing skills. For example: the subject is required to "grasp a telegraph key with the thumb and the tips of the first two fingers and to hold the entire arm in free suspense *under tension*, leaning his body forward and in this position to tap as fast as possible with the key" (Seashore, 1919, p. 174). Apart from the fact that a telegraph key is not a piano keyboard of 88 individually articulated keys across a 5-foot span, no musician on any instrument would attempt to perform in this manner — at least publicly.

Recent versions of musical aptitude tests do actually require musicians to perform on their chosen instrument (Farnum, 1969; Farnum & Watkins, 1954, 1962). However, the emphasis is on mechanical factors which are

⁴² For example, in Wing's Standardized Tests of Musical Intelligence (1961), short melodies and chords are played on the piano whereas in Gordon's Musical Aptitude Profile (MAP) (1965) melodic fragments are performed on the violin and the 'cello.

at best tangential to advanced performing skills.

It is clear that Seashore's testing conditions bear little resemblance to the act of musical performance. The tests confine themselves to isolating the fundamental constituents of pitch, intensity, time, rhythm, consonance and memory. Seashore assumed that the ability to identify fine differences between paired examples of each of the above constitutes the ability to convincingly integrate all these components into a superior performance. Subjects are required to discriminate up to a limit of 1/200 of a tone. It is questionable whether precision of discrimination to such a degree is ever required for actual performance on any string or wind instrument, let alone on the piano. In this regard, Lowery's (1929) comment is instructive, "... a passage of music involves numerous factors which, in general, are not readily isolated from one another ..." (p. 397)

This thesis has shown that while musical perception is undeniably an important aspect of musical performance, tests based entirely upon isolated factors of auditory discrimination can by no means be considered as accurate predictors of an individual's potential as a performing artist.⁴³ This is particularly so in the development of pianistic virtuosity. As Mursell (1937) (cited in Wing, 1968, p. 3) writes, "Music depends essentially not on the stimuli

⁴³ A substantial number of eminent musicians including Joseph Haydn, Robert Schumann, Hector Berlioz and Igor Stravinsky did not have absolute pitch (Cohen,1994).

which reach the external ear, nor on the response of the inner ear, but on the organization and transforming operation of the mind." It therefore follows that auditory discrimination as employed by Seashore and others is inadequate as a predictor of "pianistic talent". Simply put, the synchrony of auditory, tactile and neuro-muscular skills, the cognitive organization and creative dimension, preclude the reliance on perception or appreciation or any other one factor by itself.

Indispensable as well to a convincing musical performance are the following:

(1) The ability to make instantaneous kinaesthetic and proprioceptive adjustments on the keyboard and pedals in response to a constantly changing performing environment. This includes the ability to utilize internal and external sources of interference to creative advantage.

(2) The ability to transform organized sounds into a musical whole that communicates one's intentions to the listener.

In summary, we can say that these tests deal with the assumed ability to detect differences between isolated tones or simple melodic fragments. They do not, however, deal with the ability to execute complex works over a sustained period of time. In particular, they do not account for the precisely timed

"sensed" judgements that the artist must make in real-time. Central here are questions of balance, often in multiple parts with shifting tempi at great speed across the entire keyboard, each part with its own centre of balance, its specific movements and gestures, which may or may not be synchronized with complex pedallings and movements of the upper body. Most crucially, the tests ignore the signature of the potential master — the emotive tone that defines the character, shape, plasticity of rhythm and flow — are those factors that bring skill to the level of high art.

IV. Specific Measures of Musical Performance

The most frequently used performance measures are the Watkins-Farnum Performance Scale (1954; 1962) for wind instruments and the snare drum, and the Farnum String Scale (1969) for orchestral stringed instruments (Boyle and Radocy, 1987). While neither of these test pianistic ability, their underlying assumption is instructive in the context of this paper.

Watkins and Farnum assume that musical performance can be measured by virtue accuracy in sight-reading in which strict fidelity to the written musical text is considered to be absolutely essential. (It should be noted that sight-reading is a skill that is not necessarily consistent with the ability to communicate musically.) Therefore, the criteria for evaluation in both tests are based on the performer's ability to sight-read with minimum note and time "errors". The six categories of "errors" as defined by these two tests consist of the

following:

- (1) Pitch errors: The addition, omission of tones; or incorrect tones.
- (2) Time error: Tones that are not sustained in plus or minus one full count; or failure to observe a fermata, that is to sustain a tone beyond its indicated length.
- (3) Change of time error: Whether the piece is played in correct tempo (as specified).
- (4) "Expression" error: Failure to observe dynamic markings and terms like "*ritard, a tempo, crescendo*" etc.
- (5) Articulation error: Failure to observe a slur, staccato marking, etc.
- (6) Failure to observe a repeat sign.

As already stated, results from the Watkins-Farnum Performance Scale (1954; 1962) and the Farnum String Scale (1969) are based upon the evaluation of one's ability to sight-read a musical text with precision. However, they fail to recognize that sight-reading, even when "error free" is a very limited indicator of musical performing ability *as understood by musicians*. To the musician, any test premised solely upon sight-read deviations from a score is totally inadequate as an indicator of musical potential. On the contrary, under certain circumstances, these deviations may even indicate a high-level of performance creativity. More to the point, genuine musicianship involves a capacity to articulate a well-rehearsed piece of music (generally from memory), or to improvise a spontaneous composition spiced with a personal touch. From this

perspective, the measures designed by Farnum and Watkins are of doubtful predictive value.

This is not to say that fidelity to the musical score is unimportant, only that accuracy⁴⁴ in itself does not necessarily constitute a convincing, or for that matter, a skilled virtuoso performance. It may be of value in the process of mastering the text, but it is certainly not an end in itself for the artist/performer. Indeed some of the most celebrated concert pianists (I include here, Alfred Cortot, Artur Rubinstein, Vladimir Horowitz, Claudio Arrau and Rudolph Serkin) were as much noted for their "wrong notes" as they were for their magnificent technique and their highly individualized "interpretations".⁴⁵

⁴⁴ With the advent and development of recording techniques, the comparative measure of performing skill began to shift in the public mind from live to recorded performance. The inevitable result: note accuracy and metrical consistency take on an importance rivalling the artist's musical signature.

⁴⁵ Researchers interested in cultural perceptions of "correctness" in musical performance might well consider the following:

(a) Artur Rubinstein's humorous reflections on highlights of his career as a virtuoso pianist. "When I played in the Latin countries — Spain, France, Italy — they loved me because of my temperament. When I played in Russia there was no trouble because my namesake Anton Rubinstein, no relation, had conditioned the audiences there to wrong notes. But when I played in England or America they felt that because they paid their money they were entitled to hear all the notes. I dropped many notes in those days, maybe thirty percent, and they felt they were being cheated." (Schonberg, 1987, p. 440)

(b) Harold Schonberg's comment on Vladimir Horowitz's interpretations of works in the romantic repertoire, "He did not consider the printed note sacrosanct. He had no hesitation, for example, in completely rewriting Mussorgsky's Pictures at a Exhibition to make it pianistically more effective.

As far as timing and change of tempi are concerned, the Watkins-Farnum Performance Scale (1954; 1962) and the Farnum String Scale (1969) reveal the authors' confusion about the distinction between metre and phrase rhythm. Metre refers to the measurement of the number of beats within and between bars of music, not their execution. On rhythm, the following is instructive,

"A sense of rhythm is, however, a necessary attribute to all performers of music. It is not easy to define as it requires something more than the ability to reproduce accurately and mechanically the instructions expressed in the notation — a pianola, for example, sounds different from a skilled pianist because the former has no intrinsic sense of rhythm whereas the latter has."

(Isaacs & Martin, 1982, p. 318)

Secure in his knowledge of the Liszt style, he would add cadenzas to Liszt rhapsodies and other works, knowing full well that the composer would have raised no objections to contributions on such a transcendental level. With Beethoven and Schumann, of course, Horowitz was much more careful, and if he made any textual changes he did them with the utmost discretion." (Schonberg, 1987, p.438)

(c) On Anton Rubinstein, Harold Schonberg writes, " He [Anton Rubinstein] looked like Beethoven and he played like Beethoven, making the piano erupt volcanically and not always being very disciplined about it. Wrong notes, broken strings — these did not matter." (Schonberg, 1987, p. 269)". "When carried away, Rubinstein did not care how many false notes fell under the piano and wiggled on the ground." (Schonberg, 1987, p. 274)

Schonberg also cites Amy Fay (student of pianist, Carl Tausig), "Rubinstein doesn't care how many notes he misses, provided he can bring out his conception and make it vivid enough. Tausig strikes every note with rigid exactness, and perhaps his very perfection makes him at times a little cold." (Schonberg, 1987, p. 274)

To Watkins and Farnum, on the other hand, precision in timing is equated with the mechanical, metrical and "rigid" division of beats. By these criteria, the most "gifted" performer would be one whose playing sounds most like a pianola.⁴⁶ To a musician, on the other hand, the ability to "keep time" relates as much to "expressive timing" or "phrase breathing" as it does to the observation of temporal divisions. When the expressive context demands it, the artist/performer naturally encourages the music to "breathe" by introducing fluctuations in the tempo or through "pulling and pushing the beat" and other vitalizing techniques. Indeed, the frequently discussed *rubato* identified with the music of Chopin, Schumann, Liszt, Rachmaninoff, Scriabin, and most other major composers, is precisely this ability to breathe life into a piece of music. The jazz musician will similarly vary and juxtapose beat relationships into surprising and unexpected patternings.

In addition to flexibility in rhythm and timing, it is also important to emphasize that musical expression, which encompasses a number of intangible qualities (not always easy to quantify) is not confined to dynamic changes or rigid adherence to notated articulations⁴⁷ as Farnum and Watkins assume, but

⁴⁶ A pianola (player piano) is a reproducing instrument that performs by itself through mechanical means.

⁴⁷ Articulation encompasses much more than the performance of a slur. It has to do with an infinite number of durations, from staccatissimo to legatissimo and sostenuto, including durational relationships that cannot be notated with any degree of precision.

rather to a totality of factors that add up to more than the sum of their parts.

Summary

This chapter has attempted to clarify the value of current concepts of musical giftedness, as they apply to the virtuoso pianist. It begins by reviewing a number of representative studies from the psychological, educational and pedagogical literatures involving gifted pianists and musicians. With rare exceptions (Judd, 1988), the studies reviewed do not distinguish piano performance from other musical abilities. This lack of precision in current operational definitions of musical giftedness is a limiting factor that impoverishes the predictive value of these research efforts.

Section two of this chapter reviewed constraints of a non-musical nature imposed upon the individual. These may range from ingrained social biases and cultural stereotypes, to traditional pedagogical assumptions and standardized evaluation tests of musical abilities. All have the potential of inhibiting the pianist's ability to develop a high level of musical confidence.

In this regard, it is important again to mention two prevalent assumptions that have made a significant impact on theories of musical giftedness and their development: the assumption of (i) a genetically predisposed gift for music, and (ii) the stability of this musical gift.

In examining the assumptions and testing procedures which purport to measure musical abilities, we have shown that these are based almost

exclusively on ability in auditory discrimination of discrete tones — hardly a reliable predictive measure.

By the same token, in reviewing a specific measure of musical performance (Farnum, 1969; Watkins and Farnum, 1954, 1962) we found that the sole criteria employed for evaluation was the individual's ability to sight read a piece of music with a minimum number of errors i.e. deviations from the notated score: given the nature of higher order musical communication, sight reading facility, particularly when premised on strict adherence to a text, can hardly be considered a reliable measure of virtuoso potential.

From the above observations, we may therefore conclude that (1) the majority of studies reported in the literature have not adequately addressed the nature of virtuoso pianism, its developmental realities and performing experience i.e. they have demonstrated neither the precision nor depth necessary to enhance our understanding of the phenomenon and (2) as a consequence, there is no current operational definition of musical giftedness capable of accounting for the qualities unique to the solo virtuoso pianist. This argues for a reconsideration of present thinking and research aims.

CHAPTER 5: CONCLUSION

Throughout this thesis, we have noted that despite a substantial body of

studies that touch on the nature of musical giftedness, surprisingly few have dealt with the question of giftedness as it relates to the virtuoso solo pianist. Those that do attempt to explore the phenomenon have confined themselves, for the most part, to historical and anecdotal accounts of the lives and works of musicians. How the virtuoso concert pianist can be distinguished from the merely competent is rarely addressed, let alone studied in any measure of depth. As a consequence, we find ourselves with no existing conceptual framework capable of providing a basis for the analysis of the nature and the developmental realities that must enter into any discussion of the maturation of the virtuoso pianist. As we have shown, the central issue here involves, and *must begin*, with a consideration of the complex dynamic interactions that exist between the performer, instrument, audience, learning and performing environment.

A successful performance, from the perspective of this thesis, begins with the recognition of certain unique features of live piano performance. A "live" performance on the piano is a "real-time" activity that demands high-order physical organization, concentration, and artistic sensitivity. As an "open skill" (Allard & Starkes, 1991; Segalowitz, in preparation), it obliges the artist to make sensed judgements instantaneously in response to a dynamic and unstable environment. This means being fully in tune with one's changing internal sensations while engaging in a formal situation under the scrutiny of an audience, critics, aspiring pianists and other musicians.

The pianist's relationship to the piano has occupied the greater part of this thesis. We have attempted to show how contingent this relationship is on the unique peculiarities of the piano's construction and its technological history. Essentially, the pianist is the inheritor of an instrument that poses challenges capable of either serving as a barrier to progress or as an opportunity for creative achievement. How effectively the pianist transcends the former would seem to be one of the distinguishing characteristics of the virtuoso.

The current tendency to globalize musical giftedness falls short of addressing the complex nature of pianism as a performing discipline. The limitations of this tendency are clearly evident when we review representative studies. Musicians in these studies are generally considered as a homogeneous group. No clear-cut distinctions are made between instrumentalists and vocalists, solo concert pianists, composers, improvisers or ensemble players. By the same token, the mono-savant, the child prodigy, the aspiring professional pianist and the veteran concert pianist are considered together without regard to individual performance capability, repertoire or experience.⁴⁸

A related assumption, even more pervasive than the above, is the conventional notion of musical giftedness as an all-embracing and stable genetic pre-disposition. This received "art will out" wisdom shared by researchers with

⁴⁸ It is important to note that a thorough knowledge of the musical status and background of each participating subject would seem to be mandatory in any study of this nature.

many pedagogues, professionals and the lay public is undoubtedly at the core of definitions of musical giftedness that minimize the formative roles played by socio-cultural and pedagogical factors.

A case in point would be the well-established tests which purport to assess musical abilities. These tests neither address the nature of various sub-disciplines of music nor the conditions (socio-economic, cultural, pedagogical, etc) that enter into the formation of musical — let alone pianistic — giftedness.

It might be useful here to note two pertinent manifestations of the above:

- (1) Current research tends to isolate certain easily apprehensible aspects of skill and/or perception, and to assume these are reliable indicators of a global musical ability. By extension, it is assumed that performing ability itself can be measured in terms of single factors such as skill in aural discrimination or mechanical accuracy in sight-reading — two highly questionable premises.

- (2) Current research does not adequately recognize, let alone address the nature of performance creativity. This is admittedly a highly complex - even contentious - issue. However, given its central place in the development of the solo pianist, to neglect the creative dimension is, in effect, to not only deprive ourselves of the opportunity to better understand the inner-workings of the artist-performer, but to miss a cue central to the understanding of

affective communication.

The thesis concludes that, given the complex web of interactions involved in the virtuoso paradigm, and the present state of knowledge that these issues raise, the most useful first step would be to examine these interactions from an interdisciplinary perspective. To be optimally effective, the effort would necessarily be collaborative and integrative. In the section that follows, we will propose potential areas of investigation that integrate cognitive and educational perspectives with that of musical performance.

Future Research: Suggestions for Inter-disciplinary Collaboration

The issues that follow seem to be particularly amenable to interdisciplinary research since they ask that the musical performing experience be collaboratively examined and integrated from both a cognitive and developmental perspective. Interdisciplinary collaboration would make it possible to examine:

[a] The inter-relationship between kinaesthetic, auditory, tactile and related factors that coalesce into a single performing entity (perhaps a phenomenon roughly analogous to synaesthesia⁴⁹) (Cohen, in preparation).

⁴⁹ Synaesthesia is a condition in which the stimulation of one sense elicits a perception of another sense. The most widespread synaesthesia is 'color-hearing' in which a sound elicits a specific color sensation. For example, color hearing was observed in a number of distinguished musicians including Nikolai

[b] Those factors that disrupt, interfere with or block the organizational process.

We will begin by offering general suggestions on how inter-disciplinary collaboration might develop research initiatives in the latter area. Keeping in mind the importance of the complex web of interactions involved in shaping a virtuoso performance, researchers may ask:

- (a) What are the conditions and processes involved in musical performance "*blocks*" and interferences?
- (b) What are the specific errors in strategic organization involved in generating performance blocks? Are the occurrences of such performance blocks predictable and preventable? What clues can such predictors provide to the internal organization of the performer?
- (c) What theoretical significance does the understanding of blocks in high-level musical performance have on the understanding of human creativity in general?

Perhaps the most prevalent and psychologically intriguing block experienced by highly accomplished performers is a phenomenon that can be loosely described as stylistic or genre incompatibility (Cohen, in preparation). Why, for example, is a virtuoso pianist equipped with highly developed

Rimsky-Korsakov and Alexander Scriabin. (Petrovsky & Yaroshevsky, 1987).

musical, physical, intellectual and creative powers incapable of performing certain genres or pieces of music that fall easily under her hands? Why play Chopin well and Liszt badly? Why Mozart and not Bach? Why Rachmaninoff and not jazz? Why improvise masterfully and be incapable of performing from a given notated score? Why suffer inhibiting blocks when there are no interpretive or related challenges in the particular work that one has not met successfully in other contexts? The over-riding question here, of course, is the apparent inability of even the most celebrated pianist to convincingly perform, let alone master, more than a few musical genres (Cohen, in preparation). For the researcher, it offers a wealth of opportunities to examine cognitive and developmental issues (such as attention, automaticity, and musical memory) in a context that is both fresh and of potential theoretical significance.

Inter-disciplinary collaboration would be particularly useful in examining the nature of virtuoso pianism as an "open skill" in which the artist demonstrates an exceptional ability in exploiting the "affordances" (Segalowitz & Abrahamowicz, 1992) offered by the environment. Researchers may ask questions such as: How does a performer make continuous real-time judgements in an unstable environment? What real-time cognitive processes are employed by the performer in relation to the music, the instrument and the audience during a performance? Is there a synergistic relationship, if any, between the performer's psychophysiological state and the demands of the music that enables her to translate a score into a moving performance?

For the artist, however, the over-riding question remains: How does one collaborate in investigating a complex performing experience without compounding the problem or, more to the point, trivializing the nature of the experience itself?

Coda

By reviewing the complex of factors — social, cultural, historical, developmental and technological — involved in the cultivation of high level pianism, this thesis hopes to open up discussion of the premises underlying current concepts of musical giftedness. While the focus has been on the virtuoso soloist, the thesis suggests that an interdisciplinary investigation into each of the sub-disciplines of music will provide a more comprehensive understanding of the whole. In effect, once intra-disciplinary lines of communication have been established, cognitive, educational and other theories will have more tangible measures of giftedness to work with.

The thesis has emphasized the interactive nature of the musical experience. It follows that in order to understand the dynamics of pianistic virtuosity (or any other musical discipline), one must account for its interactive realities. Certainly, at both the theoretical and practical levels, to ignore these realities is to impoverish our understanding of a performing artist's internal resources, in particular the aesthetic sensibility and performance creativity that distinguish the artist from the merely skilled.

The thesis therefore suggests that a re-evaluation of existing assumptions about talent may contribute to a more productive understanding of the higher reaches of creative endeavour — one that cues into the developmental realities, affordances and interferences experienced by the budding artist. This approach to creative potential may possibly be extended to analogous fields in the performing arts and related disciplines (e.g., dance, acrobatics⁵⁰) in the hope that by identifying the properties unique to each discipline in a context where common properties can be integratively evaluated, an enriched understanding of the performer in all of us will begin to emerge.

⁵⁰ Personal communication and work in progress (Prieur, 1994).

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