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# Pierre Schaeffer today. Preliminary steps toward a renaissance of the Schaefferian approach to music

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## Abstract

This paper, in celebration of Pierre Schaeffer's hundredth birthday, examines the difficulties hindering a complete diffusion of the ideas of this French electroacoustic music inventor and theorist. In particular, Schaeffer's tabular and graphical thinking are analysed and critiqued in order to pave the way for a renewed understanding of his theory. In the second and third parts of the paper, work still to be done and a few musical cases are discussed.

Keywords: *Pierre Schaeffer, Traité des Objets Musicaux, Typo-morphology, 2D, 3D graphics, electroacoustic music.*

## Introduction

One hundred years after the birth of Pierre Schaeffer, one can study in great detail the impact the thinker and musician has had on contemporary music. Paradoxically, however, his influence is still limited to conceptual and esthetical fields. Indeed, for most people outside of France and probably Great Britain, Schaeffer's theories — not his practices — belong to the 'prehistory' of technological music. Schaeffer seems to have become a closed case.

A closer look at the current situation has brought me to another more personal proposal today — three generations after 1948, after many years of composing electroacoustic music, and after studying and teaching his ideas. The relative standardisation of digital sound techniques since 2000, the plain normalcy of electronic sound since 1970 and the increase of acousmatic or partly acousmatic situations — all these have, in my opinion, prepared a new cycle of impact in Schaeffer's approach.

Nonetheless, several important steps are still necessary before this impact can reach its peak. This paper analyses the current difficulties and problems that must be solved for a complete international understanding of Schaeffer and begins a study of the current musical situation in this light.

This is undertaken in three parts: The first concentrates on the barriers to an expanded diffusion of Schaeffer's proposals; the second points out key areas of work remaining to be accomplished to fulfil this end; and the last illustrates briefly the influence of Schaefferian sensitivity in several music styles.

## I Barriers and complexities

If one studies in detail the reasons for the limited impact of Pierre Schaeffer's ideas on the musical world outside of France, several important barriers can be ascertained:

1. The French language and cultural references in his writings and, until recently, the lack of a complete translation in English of the major works<sup>1</sup>;

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<sup>1</sup> As will be discussed below, a good translation is currently being prepared. In the meantime, no attempt has been made here to translate the Schaefferian vocabulary. The original French is retained in *italics*.

2. Schaeffer's particular use of vocabulary with its philosophical and technological positioning, as well as his partial refusal to use visuals;
  3. The compression of Schaeffer's truly multidimensional thinking into 2D graphics;
  4. The paradoxical impact of intervening evolution in sound technology<sup>2</sup>;
  5. More simply and disturbingly, 'lazy habits'<sup>3</sup> and a too linear view of history.
- The present section addresses these central problems in detail.

## I.1 Vocabulary and visual difficulties

### I.1.1 Vocabulary problems

Not taking into account for the moment important philosophical matters or cultural background questions, there are problematic words in Schaeffer's writings, even for French speakers. Some Schaefferian terms have lost the technological war. Words like *projecteurs*<sup>4</sup>, *profils*, *noeuds*, *frange* are now more widely understood as 'speakers', 'envelopes' or 'noise-bands', 'white noise', and so on. Here, Schaeffer pays the price of having worked very early, well before the synthesizer standardisation of the 1960s and 1970s. Those words can be easily 'updated', as there is little sense to fight such well-established use. Once given the 'Rosetta' stone, most musicians and students understand quickly. However, many electroacousticians keep up Schaeffer's vocabulary, for it has its own specific and poetic quality to it, once understood. This presents no problem.

Other significant words need some explanation to be really grasped: *concret*, *écoute réduite*, *epokhe*, *facture*, *poids* or even *instrument*. These call for rigorous pedagogy and proper translation of Schaeffer's writings. They require quite an effort, but Simon Emerson, John Dack, Marc Battier and others have already taken many important steps to reduce this barrier.

Thirdly, other words are really original Schaeffer and contribute much to a detailed discourse, in the opinion of several (Castanet 1995: 170-249). These special words need full discussion: *masse*, *allure*, *grain*, *son cannelé*, *site* and others. Since they are quite original, adding useful nuances to the usual English electroacoustic vocabulary, these terms should be put forward.

However, this vocabulary aspect may not be the worst type of problem.

### I.1.2 The visualisation problem

Indeed, in our inescapable visual and digital world, the complex relationship of Schaeffer with images and graphics causes many difficulties that must be addressed and resolved independently.

The causes of Schaeffer's graphical choices reside at two principal levels:

1. A technological limitation in the 1950s and 1960s. At the time, there was very little to see in the poor quality analogue sonographs or bathygrams, and such. Musical notation also had clearly revealed its limitations for describing "real-

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<sup>2</sup> Digital music, with its loss of analogue continuity and physical interfaces, can sometimes be seen as a 'false improvement'. Debates on 'too-clear hi-fi' vs. 'poetical lo-fi' come to mind. I wonder if Schaeffer would have found so many resemblances between apparently different sounds if he had heard them in a high fidelity environment.

<sup>3</sup> We note a frequent misunderstanding of the word *concrète*, even among good researchers (Dack and North 2006: 10) or, even worse, clichés along the lines of 'those disturbing French people don't do things like everyone else'.

<sup>4</sup> All the vocabulary discussed is taken from Schaeffer 1966 and Chion 1982.

world complex sounds” rather than “simplified notes”. Schaeffer was very aware of this as early as the 1940s (1952)<sup>5</sup>.

2. Even more strongly, there was a militant position by Schaeffer and his colleagues towards better listening to sound and a great disinclination, iconoclastic perhaps, for images and ‘false’ visual understanding of the sonic phenomenon<sup>6</sup>. He also was very dissatisfied with over simplifications made by acousticians and physicists of sound (cf. the Moles Schaeffer debates, 1952 vs. 1966). This led perhaps to a confusing rejection of 3D representation of the three main analytical dimensions of sound.

To study these difficulties in detail, let us turn to a few interesting and problematic cases.

#### False simplicity

Schaeffer is often deceptively simple. If we consider the seven steps progressing from the sine tone to white noise Schaeffer proposes for his category *masse*, this seems quite logical (ex. 1):

However, it is often presented in another way, revealing other symmetries (ex 2):

1. <i>Son pur</i>	7. <i>Frangé</i>
2. <i>Tonique</i>	6. <i>Noëud</i>
3. <i>Groupe tonique</i>	5. <i>Groupe nodal</i>
4. <i>Cannelé</i>	

Ex. 2 A ‘U’ shaped symmetry

This double symmetry creates a curious bending of the extremes, the sine tone and noise being interestingly related. Also note the similarity of the *son tonique* and *noëud*, being almost interchangeable in the typo-morphology discussed below. This is key for an enlargement of musical sounds, as we will see. The ‘U’ shaped presentation used in ex. 2 also gives dynamic movement to the categories. We will see another most interesting case below.

The figure also brings to our attention to the unfamiliarity of such words as *groupe tonique* rather than the common ‘chord’, *noëud* rather than ‘noise band’, *frangé* rather than ‘white noise’. In this case, quite convincingly, Schaeffer attempts to enlarge our conception of musical notes into a much broader and general sound object, at times partly or completely inharmonic or noisy. For instance, the complex sonic mixture of noises and recognisable pitches that is a *son cannelé* cannot be simply described by the usual vocabulary. A new word was necessary. In this case and several others, Schaeffer’s poetic sense<sup>7</sup> found interesting solutions. Also note that he refrains from the acoustical vocabulary for good reasons. A *masse tonique* is a sound object having a pitched quality and some richness but perceived as a whole, not as a decomposable fundamental with harmonics. The global musical perception is

<sup>5</sup> Note that his first impulse was to put together an ace-team of music notators to try to put complex sounds in traditional notes. In fact, Schaeffer had a rather paradoxical neo-classical bend, see Laliberté (2003a and 2011b.)

<sup>6</sup> I had several most interesting discussions on this subject with ‘veteran’ electroacoustic composer Beatriz Ferreyra. She often asks students to simply turn off the computer screen for a time.

<sup>7</sup> It must be remembered that Schaeffer considered literature his main art.

chosen instead of the quantitative analytic paradigm. Many of Schaeffer's choices depend on similar argumentation (1966).

We see that we can already understand much in such a small example. Let us consider a more complex one.

The *Tableau récapitulatif de la typologie*

The much-studied *Tartyp* is an apparent simple table (Ex. 3):

		Durée démesurée (macro-objets)		Durée mesurée Unité temporelle			Durée démesurée (macro-objets)	
		Facture imprévisible	Facture nulle	Durée réduite (micro-objets)			Facture nulle	Facture imprévisible
				Echantillons	Homogène continu	Tenue formée		
masse fixe	Hauteur définie Hauteur complexe	(En)	Hn	N	N'	N''	Zn	(An)
		(Ex)	Hx	X	X'	X''	Zx	(Ax)
masse peu variable		(Ey)	Tx Tn	Y	Y'	Y''	Zy	(Ay)
Variation de masse imprévisible		E (Echantillon) cas général	T (Trame) cas général	W (grosse note)	F (fragment)	K (cellule)	P (pédale) Cas général	A (accumulation) Cas général
-----				Sons tenus	Micro-sons	Sons Itératifs-----		

Ex. 3 *Tableau récapitulatif de la typologie*

In fact, this table hides a more complex organisation. It appears to have two dimensions, but is that really the case (Ex. 4)?

		Durée démesurée (macro-objets)		Durée mesurée Unité temporelle			Durée démesurée (macro-objets)	
		Facture imprévisible	Facture nulle	Durée réduite (micro-objets)			Facture nulle	Facture imprévisible
				Echantillons	Homogène continu	Tenue formée		
masse fixe	Hauteur définie Hauteur complexe	(En)	Hn	N	N'	N''	Zn	(An)
		(Ex)	Hx	X	X'	X''	Zx	(Ax)
masse peu variable		(Ey)	Tx Tn	Y	Y'	Y''	Zy	(Ay)
Variation de masse imprévisible		E (Echantillon) cas général	T (Trame) cas général	W (grosse note)	F (fragment)	K (cellule)	P (pédale) Cas général	A (accumulation) Cas général
-----				Sons tenus	Micro-sons	Sons Itératifs-----		

Ex. 4 Two main axes ?

The simplest reading uses indeed two dimensions. The vertical axis is a variation of the *masse* (spectral complexity): a pure sine tone goes at the top, a complex and ever moving noise at the bottom. The horizontal axis is a variation of time.

However, this is already slightly misleading. In truth, time is divided into two halves rather than going from left to right. This depends on the *factures*: time has its shortest value in the centre of the table (*impulsions*) and becomes longer towards the edges. The *facture* goes on both sides of the table from a short *durée réduite (formée)* to a slightly too long<sup>8</sup> *facture*

<sup>8</sup> The 'overly long' quality refers to the attention span of the ear. According to Schaeffer (1966), a sound lasting 'too long' disinterests the musical ear. Note the normative judgement implicit here. More on this paradoxical aspect below.

*nulle* to a much too long *facture imprévisible*. The left side is for homogeneous sounds, such as continuous singing, the right is for ‘grainy’ or iterative sounds, such as a drum roll. This makes three dimensions: *masse* complexity, duration and *facture*.

A second organisation is also perceptible. This table contains a clear centre: the *objets équilibrés* (ex. 5):

		Durée démesurée (macro-objets)		Durée mesurée Unité temporelle			Durée démesurée (macro-objets)	
		Facture imprévisible	Facture nulle	Durée réduite (micro-objets)			Facture nulle	Facture imprévisible
				Echantillons	Homogène continu	Tenue formée		
masse fixe	Hauteur définie Hauteur complexe	(En)	Hn	N	N'	N''	Zn	(An)
		(Ex)	Hx	X	X'	X''	Zx	(Ax)
masse peu variable		(Ey)	Tx Tn	Y	Y'	Y''	Zy	(Ay)
Variation de masse imprévisible		E (Echantillon) cas général	T (Trame) cas général	W (grosse note)	F (fragment)	K (cellule)	P (pédale) Cas général	A (accumulation) Cas général
				Sons tenus		Micro-sons	Sons Itératifs	

Ex. 5 A table with a centre

And the centre impulses are the centre of the centre. However the table also contains a middle level: the *objets homogènes* (long held or iterative sound objects), particular *trames* (textures) and pedals (ex. 6):

		Durée démesurée (macro-objets)		Durée mesurée Unité temporelle			Durée démesurée (macro-objets)	
		Facture imprévisible	Facture nulle	Durée réduite (micro-objets)			Facture nulle	Facture imprévisible
				Echantillons	Homogène continu	Tenue formée		
masse fixe	Hauteur définie Hauteur complexe	(En)	Hn	N	N'	N''	Zn	(An)
		(Ex)	Hx	X	X'	X''	Zx	(Ax)
masse peu variable		(Ey)	Tx Tn	Y	Y'	Y''	Zy	(Ay)
Variation de masse imprévisible		E (Echantillon) cas général	T (Trame) cas général	W (grosse note)	F (fragment)	K (cellule)	P (pédale) Cas général	A (accumulation) Cas général
				Sons tenus		Micro-sons	Sons Itératifs	

Ex 6 Middle levels

Finally, it also has extremes: the *objets excentriques* and the general cases (ex. 7):

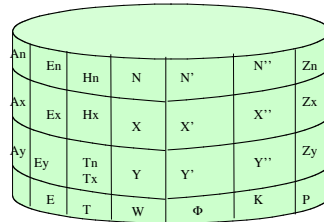
		Durée démesurée (macro-objets)		Durée mesurée Unité temporelle			Durée démesurée (macro-objets)	
		Facture imprévisible	Facture nulle	Durée réduite (micro-objets)			Facture nulle	Facture imprévisible
				Echantillons	Homogène continu	Tenue formée		
masse fixe	Hauteur définie Hauteur complexe	(En)	Hn	N	N'	N''	Zn	(An)
		(Ex)	Hx	X	X'	X''	Zx	(Ax)
masse peu variable		(Ey)	Tx Tn	Y	Y'	Y''	Zy	(Ay)
Variation de masse imprévisible		E (Echantillon) cas général	T (Trame) cas général	W (grosse note)	F (fragment)	K (cellule)	P (pédale) Cas général	A (accumulation) Cas général
				Sons tenus		Micro-sons	Sons Itératifs	

Ex. 7 Extremes

This second organisation gives another dimension or even two (extreme sides and extreme low). Is this table in four dimensions or more?

### N-dimensions

As shown, the *Tartyp* is really a multidimensional and dynamic analysis compressed into a 2D shape. In fact, it is even slightly more complex. If we listen to Schaeffer's commentaries (1967), there is a merging of the extremes *Echantillons* and *Accumulations*. The compressed 2D becomes a complex shape, a kind of cylinder within timbre-space (ex. 8).

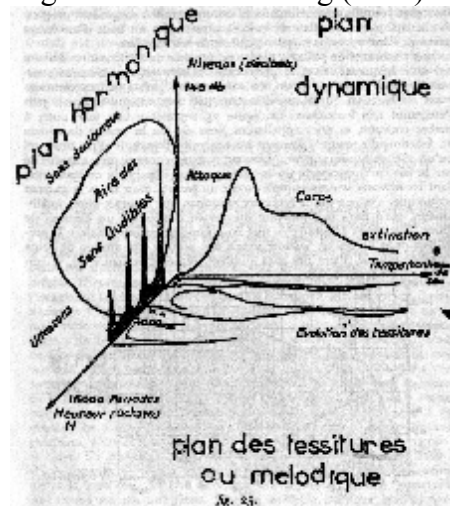


Ex. 8 A cylinder in timbre-space?

Why such a compression, so taxing to the reader? Communication technologies of 1966, mostly paper, and Schaeffer's thinking of the time<sup>9</sup> excluded such topological complexities of n-dimensional shapes as being "useless amusing physics" (1966:416). But time has passed and n-dimensional topologies are used daily in a broad community and studied in high school. Complex topologies are becoming more and more familiar. Logically, multi-dimensional representations of Schaeffer's ideas are emerging: cf. Adrea Valle's proposal of 2007. I, too, am working on a different type of presentation of the typomorphology. It will be published in the next few months.

### A semi-hidden 3D sensitivity

As is well known, Schaeffer was tempted at first to use the science of his time to analyse sound objects, as can be read in the joint chapter by Moles and Schaeffer in Schaeffer (1952). In that chapter, a 3D diagram is most revealing (ex. 9):



Ex. 9 Three dimensions of sound

This key representation unites the sound analyses in a single view. In a significant way, note that instead of the common acoustic axes 'frequency', 'time' and 'level', we find here *hauteur*

<sup>9</sup>

I will discuss another possible reason, a paradoxical conservatism, below.

(pitch), ‘time’ and ‘level’. That is the result of Schaeffer’s desire to base his analysis on perceptive musical qualities, rather than on acoustic ones. Also note that in this version, level is in decibels: the refusal of acoustics is not yet complete. After a time, however, the tools and methods of acoustics left Schaeffer quite dissatisfied. The Moles Schaeffer controversy led to an abandon of this 3D representation (1966: 415-416):

Quant à cette représentation à trois dimensions de l’objet physique, elle n’a guère qu’un intérêt de curiosité. Passé la satisfaction de voir ainsi l’accord parfait, ou le coup de gong, sous forme de sculpture abstraite, on ne peut que regretter ce coûteux passe-temps. L’auteur, qui s’y attarda naguère [...], ne saurait trop conseiller au lecteur de fuir cette physique amusante qui ne peut servir en rien la musique. Revenons à la cabine de prise de son : quelles sont les manipulations qui se présentent à notre portée ?<sup>10</sup>

And yet, this paradigm, *le trièdre de référence*, permeates all of the ulterior approaches in a semi-conscious way, further complicating the situation by not being clearly integrated, in my opinion.

#### Dynamic processes

As we have seen in example 2, Schaeffer’s thinking is dynamic, even in the temporal sense. Let us look at this familiar table, the four steps of listening (ex. 10):

*Je vous ai ouï malgré moi, bien que je n'ai pas écouté à la porte, mais je n'ai pas compris ce que j'ai entendu*

<p><b>4. Comprendre</b>          - pour moi : signes          - devant moi : valeurs (sens-langage)</p> <p>Emergence d’un contenu du son et référence, confrontation à des notions extra-sonores</p>	<p><b>1. E c o u t e r</b>          - pour moi : indices          - devant moi : événements extérieurs (agent-instrument)</p> <p>Emission du son</p>
<p><b>3. Entendre</b>          - pour moi : perceptions qualifiées          - Devant moi : objet sonore qualifié</p> <p>Sélection de certains aspects du son</p>	<p><b>2. O u ï r</b>          - pour moi : preceptions brutes, esquisses de l’objet          - Devant moi : objet sonore brut          - Réception du son</p>

1 et 4 : objectif

2 et 3 : subjectif

3 et 4 : abstrait

1 et 2 : concret

Ex. 10 Four steps of listening

The apparent 2D grid is really a cycle in time, as can be gathered by the numbers and the memorisation sentence, as well as from the discussion in Schaeffer (1966). Once again there is a dynamic movement included in the diagrams. This inclusion of time and cycles in a flat page of paper is quite striking: the more we go into the detail of Schaeffer’s ideas, the more complexity is revealed.

Lets now sketch another study in complexity.

<sup>10</sup> “Regarding this representation in three dimensions of the physical object, it has mostly a curiosity interest. The satisfaction of thus seeing the perfect chord or the gong strike as an abstract sculpture is passed; one can only regret this costly pastime. The author who lingered over it a time ago [...] can only counsel the reader to flee this amusing physics that cannot serve music in any way. Let us go back to the sound booth. What manipulations are available?” (my translation).

### Complex morphologies

If we look at the next important diagram of Schaeffer, the morphological summary, we find another multi-dimensional analysis compacted in apparent 2D. At first, it may appear straightforward: seven *critères de perception* meet nine analytical categories (3 *qualifications* and 6 *espèces*):


- 7 critères de perception musicale :
  - 1 Masse (généralisation de la hauteur)
  - 2 Dynamique (amplitude perçue)
  - 3 Timbre « harmonique » (enveloppe spectrale)
  - 4 « Profil » mélodique (enveloppe)
  - 5 Profil de masse (évolution de la masse)
  - 6 Grain (texture du son)
  - 7 Allure (vibrato généralisé)
- 9 catégories
  - Qualification :
    - 1 Type
    - 2 Classe (morphologie musicale)
    - 3 Genre (caractérologie musicale)
  - Espèces :
    - 4 Site tessiture (hauteurs)
    - 5 Calibre et écarts (hauteur)
    - 6 Site poids (intensité)
    - 7 Calibre relief (intensité)
    - 8 Impact (durée)
    - 9 Module (durée)

Ex. 11 Seven criteria by nine categories

This generates a very dense 7 \* 9 table, plus arrows and interdependent sectors (ex. 12a and b):

	1	2	3	4	5	6	7	8	9										
	Qualification			Espèces															
Critères	Types Rappel typomorphologique	Classes Morphologie musicale	Genres caractérologie musicale	Hauteur		Intensité		Durée Des variations d'émergence											
				Site tessiture	Calibre écart	Site poids	Calibre relief	Impact	Module										
1	Masse	Tonique type N Complexe X Variable Y Quelconque W, K T	1. Son pur 2. Tonique 3. Groupe tonique 4. Cannelé 5. Groupe nodal 6. Nœud (son nodal) 7. Frange (bruit blanc)	Textures  caractéristiques de masses	7 8ves * 12 = 84 degrés Harmonique ou Couleur Registres -1 surgrave 0 très grave 1 grave 2 mezzo grave 3 diapason 4 mezzo aigu 5 aigu 6 très aigu 7 sur-aigu	Harmonique : Intervalle  Couleur : Epaisseur	Poids d'une masse Homogène  1 <i>ppp</i> 2 <i>pp</i> 3 <i>p</i> 4 <i>mf</i> 5 <i>f</i> 6 <i>ff</i> 7 <i>fff</i>	Profil de la texture de masse	(seuil de reconnaissance des masses pour les sons brefs)										
2	Dynamique	Nulle : homogène H Itérative X Faible : trame n,x, t Formée : note N, X N'', X'' Impulsion : N', X' Cyclique : Zk Réitérée : E Accumulée : A	Anamorphoses: Profils Chocs V Résonants  Decrescend o > Delta <> Creux >< Mordant ^... Amorphe : Profil plat	Attaques (timbre dynamique) : 1 abrupte 2 raide 3 molle 4 plate (pseudo-mordant) 5 douce 6 appui 7 nulle			Poids d'une masse profilée en fonction de son module : 1 <i>ppp</i> 2 <i>pp</i> 3 <i>p</i> 4 <i>mf</i> 5 <i>f</i> 6 <i>ff</i> 7 <i>fff</i>	Module du profil  Faible Moyen fort	Variation du profil  Modéré Lent Vif <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>7</td> <td>8</td> <td>9</td> </tr> </table>	1	2	3	4	5	6	7	8	9	Sons brefs  Sons mesurés  Sons longs
1	2	3																	
4	5	6																	
7	8	9																	
3	Timbre harmonique	Soit : timbre global Soit : masses secondaires M <sub>1</sub> , M <sub>2</sub> , M <sub>3</sub> , ... Timbre des masses Th <sub>1</sub> , th <sub>2</sub> , th <sub>3</sub> , ...	(lié aux masses) Nul 1-7 Tonique 2 Complexe 6 Continu 3-4 Cannelé 4-5	Caractère du corps sonore Creux-plein Rond-pointu Cuivré-mat ...	Couleur  Sombre Claire	Ampleur Étroit Ample <table border="1"> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4	Richesse  Timbre pauvre Timbre riche	Variation : d'ampleur, de couleur de richesse  no 1 à 9	(seuil de reconnaissance des timbres pour les sons brefs)						
1	2																		
3	4																		

Ex. 12a Morphologies (1st part)

	1	2	3	4	5	6	7	8	9																									
		Qualification				Espèces																												
Critères	Types	Classes	Genres	Hauteur		Intensité		Durée	d'émergence																									
	Rappel typomorphologique	Morphologie musicale	caractérologie musicale	Site tessiture	Calibre écart	Site poids	Calibre relief	des variations	Module																									
								Impact																										
4	Profil Mélodique (variations)	(notes y seulement) podatus torculus clivis porrectus 	Caractère du profil : pizz., mélodique, trainage, etc.	ou site du profil (voir masse)	Ecart mélodique : faible moyen fort	Liaison du profil mélodique : au profil dynamique	fil mélodique : Modéré Lent Vif	<table border="1"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> </table>	1	2	3	4	5	6	7	8	9	Partiel (voir col. 3) début corps chute ou total																
1	2	3																																
4	5	6																																
7	8	9																																
5	Profil de masse (variations)	Evolutions typologiques : fluc. N/X ou X/N évol. Y/W ou W/Y modul G/W ou W/G	(épaisseur seulement) dilaté < delta > aminci > en creux ><	Evolution caractéristique : en masse en timbre harmonique	Incidence sur la tessiture ou sur la couleur (masse et timbre harmonique)	Ecart d'intervalle ou d'épaisseur : faible moyen fort	Liaison du profil de masse : au profil dynamique	fi l de masse : Modéré Lent Vif	Partiel (voir col. 3) début corps chute ou total																									
6	Grain (entretien)	Pur ou mixte de : résonance, frottement, itération	<table border="1"> <tr><td>Frémis. rugueux</td><td>Fourmill. mat</td><td>Limpi. lisse</td></tr> <tr><td>gros</td><td>net</td><td>fin</td></tr> </table>	Frémis. rugueux	Fourmill. mat	Limpi. lisse	gros	net	fin	Harmonique Compact-harmonique	Grain apprécié en Couleur du grain	masse ou timbre Epaissur du grain	Poids relatif Grain – masse liés	Texture dyn ami du grain faible moyenne forte	Variation de grain ampleur / vit esse no 1 à 9	<table border="1"> <tr><td>serré</td><td>ajusté</td><td>lâche</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> </table>	serré	ajusté	lâche	1	2	3	4	5	6	7	8	9						
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7	Allure (entretien)	Pur ou mixte de : mécanique vivante naturelle	<table border="1"> <tr><td>ordre</td><td>fluct.</td><td>désord.</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> </table>	ordre	fluct.	désord.	1	2	3	4	5	6	7	8	9	régulière vibrato progressive irrégulière chute raide, amortie, incident		Ecart en hauteur d'allure faible moyen fort	Poids relatif allure/dyna-mique	Relief dyn. d'allure : faible moyen fort	Variation d'allur e ampleur / vit esse no 1 à 9	<table border="1"> <tr><td>serré</td><td>ajusté</td><td>lâche</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> </table>	serré	ajusté	lâche	1	2	3	4	5	6	7	8	9
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Ex. 12b Morphologies (end)

This table contains a true treasure of ideas, although it is difficult to read<sup>11</sup>. The seven “perception criteria” are by themselves quite interesting. The first five are mature proposal of useful criteria, despite the sometimes unfamiliar wording. As discussed above, the concept of *masse* does bring an interesting unification of pitch and noises. Dynamics are presented in a straightforward manner. The concept of *profil*<sup>12</sup> applied to *masse*, generalised ‘melody’<sup>13</sup>, *timbre harmonique* and, more indirectly, to dynamics. As pointed out above, the terms ‘grain’ and ‘allure’ bring interesting tools for studying the more or less stable parts of sounds, while the different elementary profiles proposed for the various classes and genres are full of insight and eminently applicable to real musical situations.

The studies of the *espèces* are also mostly useful. The idea of *site*, of loosely defined scales and of perceptual weight (*calibre*) generalised to inharmonic and noisy sounds, as well as pitches or the other perceptive criteria, are all very relevant. They achieve much of the proposed enlargement of musical sound by giving auditory handles by which the composer can ‘grasp’ the sounds and their details. In a similar way, the various ‘local’ tables, uniting the different local scales, are interesting and mostly practical, if a bit hard to decipher at first.

These local tables illustrate once again the richness of Schaeffer ideas, another multi-dimensional analysis. Each main cell of the table really is an analytical dimension of its own. And there are several interactions between the cells, as the local tables and arrows show. A strict traditional scientist might complain that this is the result of variables that are not independent enough but for a musician in the twenty-first century, interested in complex timbre, fuzzy logic and complex processes, this is not too troublesome. Once again, this

<sup>11</sup> The problem is even worse, as the page setting of the original table split it in four pages.

<sup>12</sup> Now better known as an ‘envelope’.

<sup>13</sup> The traditional notion of melody, that is movement of pitch in time is generalised by Schaeffer, with the concept of *masse*: complex sounds and varying sounds can also be followed melodically, after a fashion.

multi-dimensional approach begs for another kind of representation, since the original 7\*9 table requires perhaps too much discussion.

However, I am less convinced by the term *timbre harmonique*, probably used to avoid the usual acoustic ‘spectrum’. The proposed term puts a bit too much emphasis on ‘proper’ harmonic spectra, as opposed to ‘improper’ inharmonic spectra. This is in contradiction to the successful enlargement of pitch into *masse*. This element, combined with the centre-to-extremes organisation of the *Tartyp*, leaves me in doubt. Could Schaeffer really have preferred ‘well equilibrated sounds’, in plain contradiction to his main success, a renewed importance of non-pitched and complex timbres? The use of a very French and normative word, *sofège*, goes in the same strangely conservative way, as well as his distaste for overly artificial sound treatment and, even worse, his complete about-face in the late 1980s disavowing his musical work<sup>14</sup>. It could also be the case of a man from a certain generation, mostly neoclassical in taste, distrusting serialist avant-garde, and struggling with an entire new realm of music in a hidden hesitant manner. In my opinion, Schaeffer is a somewhat reluctant messiah, like Arnold Schoenberg was, a fact I will soon document in publication (2011b).

These paradoxical aspects of Schaeffer have been troubling me for some time (1994, 2003a, 2008), but have not at all caused any disinterest. Indeed, despite this criticism, let there be no misunderstanding: I am very strongly convinced by most of Schaeffer’s proposals and find them relevant and useful. My criticism seeks to be a healthy one: lively and deep ideas generate debates and dynamism. I intend to spend still more time on my proposals of a renewed graphical presentation.

## II Towards a renewed impact of Schaeffer?

After this friendly critique, let us consider a few elements that leave me optimistic concerning a renewed impact of Schaeffer’s ideas. One can ascertain several current elements that will probably help it.

The first is an evident normalisation of technology for the composer. There has been no profound change<sup>15</sup> since 2000 (arguably since 1996) in the sound technology, only improvement of detail (faster and cheaper computers, high sonic definition of 64 bits and 128kHz, multichannel) and the opening of global and local networks. This relative stability allows the musician to go much deeper into the sonic work than ever before.

This relative stabilisation has permitted a consolidation of the habit of the electric sound for the listener. Music has been coming out of speakers for more than seventy years now. It is, for most people, the normal musical situation. Indeed for my students, long used to recorded and processed sounds, say of a drum kit, the normal acoustic sonorities seem strange or even disturbing. An unprocessed ‘messy’ high-hat cymbal or snare drum can be quite a discovery to them.

This leads to another habit. Music teachers and professors have been using electroacoustic music of all kinds for quite some time. Perhaps not everywhere or always with the same reverence as classical instrumental music, but still various types of electric music have been listened to regularly. Three or four whole generations have been exposed to it. Such an exposure prepares the musician and the listener for a natural understanding and use of electroacoustic music, even in an unconscious way, as will be discussed below.

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<sup>14</sup> I personally heard him denouncing all this research as “pointless” and “unmusical” in Quebec City in 1986, describing the digital synthesizer in the studio, our much loved main instrument, as “the atomic bomb of music”. See Laliberté (1994, 2003a and 2008).

<sup>15</sup> Actually, this can be disturbing as well: most digital developments have been to recreate former analogue equipment and concepts. We could be much more adventurous, as Dahan (2005) argues convincingly.

Another sign of interest and accelerating factor, besides the anniversary celebrations and seminars, is the reissue of Schaeffer's main music works in French around the 1998 anniversary: *A la recherche de la musique concrète, De la musique concrète à la musique même, Les machines à communiquer...* A new generation of researchers has easy access to those important works. The multilingual reissue of *Solfège de l'objet sonore* is also a boon, both because it revives this exceptional work by Schaeffer, Reibel Ferreyra and the others, but also because of its multilingual aspects. Schaeffer can be studied outside of the French community, as has been the case for some time in Argentina, Portugal, Italy and Croatia.

Lastly, the normalisation and habit of n-dimensional representations has at last been rendered practical with the help of high-speed computers and interactivity. Several new graphic and multimedia techniques will allow other possibilities.

In my optimistic opinion, therefore, now is the time for Schaeffer to reach a greater level of impact on the musical world.

## II. 1 Further help

In that case, what is still missing? What can be done now to carry on with this task?

First, the full impact of Schaeffer strongly calls for complete translation in English of the most important book, the *Traité des Objets Musicaux*. A few interesting attempts have been made but they are still incomplete. However, quite recently, the fundamental *A la recherche de la musique concrète* and the companion *Guide des objets sonores* have been very competently translated by John Dack and Christine North, of the University of Middlesex. *In Search of a Concrete Music* is soon to be published by the University of California Press, while the *Guide To Sound Objects. Pierre Schaeffer and Musical Research* was published online in 2009. As some may know, the same team is now far advanced in its complete translation of the *TOM*.

Further down the road, a critical bilingual edition of the *Traité des Objets Musicaux* would be necessary, taking the personal archives of Pierre Schaeffer now deposited at IMEC, close to the University of Caen, in Normandy as its point of departure. This formidable task necessitates an interdisciplinary/international team and a willing editor; but, if the English translation of the *TOM* achieves its potential success, one can be optimistic.

## III Electroacoustic sensitivities. A few musical cases

To finish this paper, a rapid study of a few musical cases shines hope for future developments. Just as Schaeffer proposed, the numerous *Monsieur Jourdain*<sup>16</sup> of electroacoustic music — often self-thought, art-school thought, practitioners of rock, jazz, techno, hip-hop, film and media music — are actually listening very attentively to sound and now have great tools at their disposal. This goes with a post-modern weakening of the barriers between so-called popular and high-art music. One can now detect a true electroacoustic listening of much popular electric music.

This is not the first time. The popular music of 1967-1975 with a psychedelic and a certain rock'n roll creativity<sup>17</sup>, composed at the peak of the analogue recording studio, already had an important electroacoustic side. How could one forget Jimi Hendrix or Pink Floyd and their advanced live-electronics in a rock setting? The same can be argued for much of the Progressive Rock movement (King Crimson, Yes, Genesis, Soft Machine, Gentle Giant, Mike Oldfield...).

We can suggest that this came about for a series of converging reasons:

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<sup>16</sup> Who "wrote prose without knowing it", Molière (1670).

<sup>17</sup> This has not lasted too long, however. The industry came back to power around 1976 with the Disco machine.

1. First, a general curiosity and taste for ‘something different’ in the counter-culture musical world of the late 1960s pushes open-minded musicians toward increasing complexity of all musical dimensions.
2. This is contemporary with rock music’s shift from a working class public to a middle or upper class public. The higher classes have larger musical references and better musical preparation; and this culture affects musical projects. The bands Yes or ELP are significant in this sense, after the Beatles started the tendency.
3. The more commercial need for developing a personal sound recognisable on radio and records coupled with the fact that not all pop musicians are instrumental virtuosos leads to important research in studios, starting with Elvis, Jerry Lee Lewis, the Beatles or Beach Boys and not forgetting Motown or Stax Records. Might this be compared to Pierre Bourdieu’s *Distinction* (1979): a “new sound” for a sonic “distinction”?
4. By 1970, the commercial studio, financed for the above reasons, becomes a sophisticated tool, truly encouraging experimentation. Again the Beatles, Hendrix and Pink Floyd come to mind. Such studios almost mechanically converge with sophisticated research electroacoustic studios. Thus a McLuhanian (1964) effect appears: a common electroacoustic media brings comparable results in the two former separate fields of popular and art music.
5. Right on the limit between classical music and popular music, records like W. Carlos’ *Switched-On Bach* (1968) or Morton Subotnick’s *Silver Apples of the Moon* (1967), are very influential for the diffusion of an electroacoustic tool that is becoming a popular instrument: the analogue synthesizer<sup>18</sup>. The sound of popular music has become electroacoustic.

On the high-art side, these pop experiments had an impact as well. The two musical genres are now as two mirrors facing each other. The music not only of the electroacoustic composers but also of the mixed music spectralists (Grisey, Murail, Dufourt) cannot be conceived and realised without the electroacoustic experience combined with the live rock *instrumentarium* of electric guitars, synthesizers and sound treatment (Laliberté 2003b, 2011a), as well as the better known examples of Stockhausen or Subotnick. This ‘unlikely’ encounter is not unrelated to Schaeffer opening of music to more popular genres<sup>19</sup>. It also constitutes an interesting side effect of a paradoxical neo-classical attitude. Not an accident at all, the opening of electroacoustic music to popular music was further developed by Schaeffer’s successors: Bayle, Teruggi, and Zanessi.

One might also point out that by 1970, serialist or post-serialist avant-garde was getting “worn” (Laliberté 2006). A new approach, fresher, more open, closer to the 1968 ideals was sought out. In New York City, the repetitive school (Riley, Reich, Glass) succeeded around 1967 in creating a new aesthetics largely dependent on the discovery both of the tape loop and of African or Eastern music. These are two important Schaefferian results, as Chion (1982) points out. In Rome and Paris after 1974, the spectralist school, in an attempt similar to the Philip Glass Ensemble or Steve Reich’s, founded the *Itinéraire* ensemble that included both classical instruments with the most recent avant-garde

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<sup>18</sup> A curious parallel can be drawn between Carlos and the synthesizer: Walter Carlos was an electroacoustic student of Ussachevsky and became world famous in the popular world for his synthesizer versions of Bach, just before becoming Wendy Carlos and a noted film music composer (*Clockwork Orange*, *Tron*, ...).

<sup>19</sup> And to a most important ethnological music — he had a hand in the famous Ocora recording collection of ethnic music — more than twenty years before the ‘world music’ fashion of the 1980s until today.

techniques, and electric instruments quite similar to the progressive rock band. This was for clear reasons. Anyone really listening to rock records at the time could hear some very satisfactory sounds, a true enlargement of the sonic palette, even for avant-garde composers. Pieces like Dufourt's *Saturne* (1978-79) or in a lesser degree Murail *Treize couleurs du soleil couchant* (1978) are good examples of such a fusion (Laliberté 2011a). Another interesting case is the first success of Mike Oldfield's *Tubular Bells* (1973). This avant-garde pop piece was composed after the folk guitarist heard a repetitive composition of David Bedford, an English follower of the repetitive school. In turn, because of its important success, both musically as a great new orchestration mixing electric and acoustic instruments, and commercially, this piece influenced Bedford himself and many others towards an electrified repetitive avant-garde music.

The digital revolution did not stop this effect of facing mirrors. The advent of the digital sampler, taking over the imitative synthesis functions of the previous generation of equipment like the Mellotron, further opened the sonic palette of composers and allowed them a second generation *musique concrète*, even unknowingly. In the 1980s and later, records and compact discs of Peter Gabriel, Kate Bush, The Art of Noise, Brian Eno, David Bowie, and many others display a strong electroacoustic influence, going further than the mostly 'tip of the hat' exhibited by the Beatles<sup>20</sup> and the early 1970s pop musicians. For instance, a second generation of King Crimson produced a series of recordings in the early 1980s that made use of an interesting affinity with repetitive music and the finesse of the better electroacoustic compositions. About ten years later, artists like Björk or Sonic Youth kept up this often-complex fusion of pop music and electroacoustic sensitivity. Recent artists like BT, Camille, Emilie Simon and others carry on in a comparable manner. In a complementary way, artists like Bobby McFerrin, the Zap Mama or, even more recently Eluveitie display an interest for the expanded noises and ethnic sounds and contrasting methods of making music quite close to Schaeffer's expansion.

### Conclusion

This paper proceeded in three parts. The first studied in detail the main difficulties in the graphical approaches of Pierre Schaeffer, which cloud an easy understanding of his most important ideas. Unfamiliar vocabulary, multidimensional and dynamic analyses render his tables complex, despite their great usefulness. The second listed the tasks that remain to be accomplished before Schaeffer's work can reach its full impact. The main task remaining is a complete translation of his *Traité des objets musicaux* followed by a critical and bilingual edition of the same. The final brief section presented a few cases of popular and contemporary music in which a clear electroacoustic sensitivity is perceptible. This sort of half-wild or unconscious electroacoustic composition fills me with great optimism, for now there is a whole new generation of musicians ready to learn more about Schaeffer.

With this newly found sensitivity to sound and the undeniable quality of today's common studio, there is great reason for hope — and a lot of work remaining to realize it!

I wish to thank the organizers of the *Pierre Schaeffer: MediArt* symposium for a memorable few days in Rijeka and Ms Joyce Shintani for the help in putting these ideas in a good English language.

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