Expression and Meaning in *Tasol*: Hedonic Effects of Development vs. Chance in Resolved and Unresolved Aural Episodes

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Zusammenfassung

Der vorliegende Bericht beschreibt eine Studie, in der einzelne sowie kombinierte Effekte struktureller Parameter einer vollständigen theatralisch-musikalischen Performance (*Tasol*) experimentell überprüft wurden. Der Autor des Stücks war dabei gleichzeitig auch der Leiter des psychologischen Experiments.

Die Studie war speziell darauf angelegt, die Effekte einer klassischen (herkömmlichen) bzw. zufälligen Anordnung sowie der Darbietungsweise auf die Bewertung zu ermitteln. Vier Versuchsgruppen in Lahti, Amsterdam, Rotterdam und San Diego (N = 184), die aufgrund ihrer ästhetischen Erfahrungen in zwei Untergruppen klassifiziert wurden, beurteilten (in Kleingruppen) acht Versionen des Originals (2 × 2 × 2 between subjects design), die als schwarz-weiße Videos dargeboten wurden. Die orthogonalen Faktoren repräsentierten die drei konstitutiven Elemente des Stücks, wobei das im folgenden jeweils zuerst genannte für die Originalversion steht: (a) Entwicklung und Höhepunkt vs. zufällige Anordnung; (b) Tod vs. Nicht-Tod der Akteure; (c) respiratorische (Niesen, Lachen, Keuchen) vs. instrumentale (drei Spielzeuginstr.) Klangereignisse. *Quasi-Tasol*, die dem Original am ähnlichsten gestaltete Videoversion, wurde auf den beiden zentralen psychoästhetischen Dimensionen (Gefallen, Interesse) mit Abstand am höchsten eingestuft. Auf der Interesse-Skala galt dies für beide Untergruppen, auf der Gefallens-Skala nur für die ästhetisch Erfahreneren. Die partiell sich zeigenden Effekte auf weiteren Skalen könnten indirekt erklären, weshalb Zufallselemente, außer bei Minderheiten, kaum Akzeptanz finden dürften.

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Abstract

Reported here is a detailed experimental examination of the individual and combined effects of the structural elements of an entire and intact quasi-musical performance piece. The playwright of *Tasol* and the researcher were the same person. The study was especially concerned with the hedonic impact of classical vs. aleatory components of the piece and of its mode of presentation. Four samples of subjects in Lahti, Amsterdam, Rotterdam, and San Diego (N = 184), which were classified into two subsamples on the basis of aesthetic experience, rated, in small groups, the eight research versions of the original piece (a 2 × 2 × 2 between-subjects design), that were presented on black & white videotapes. The orthogonal factors represented the three constituent elements of the piece, with the first mentioned being the original: (a) Development + Climax vs. Chance; (b) "Death" vs. "No Death" of the players; and (c) Respiratory/Vocal (sneeze, laugh, cough) vs. Instrumental (three toy instruments) performance of the aural events. On the key psycho-aesthetic dimensions of pleasingness and interestingness, *quasi-Tasol*, the research version closest to the original, was rated by far the highest of the eight. This was true for both sub-samples on the interestingness scale, but only for the aesthetically experienced sub-sample on pleasingness and a number of other scales that helped explain the hedonic advantage of the original piece. These and auxiliary results indirectly explain the failure of aleatory and stochastic works to appeal to all but the most rarefied audiences.

1. Introduction

The seminal aleatory, stochastic, and other indeterministic works by composers such as John Cage, Iannis Xenakis, and Karlheinz Stockhausen can be regarded as attempts to step outside the rigidities of the Western musical tradition – in terms of compositional rules and devices, structure, meaning, expressiveness of both the musical material and performance parameters, and, significantly, audience expectations.

Two among many elements that especially the aleatory approach eliminates seem particularly important in terms of the traditional ideas of structure, meaning, and expression: (a) the developmental progression and (b) the final resolution or coda.

It is of considerable psycho-aesthetic interest to examine in detail, and experimentally, the nature and extent of the impact of this kind of elimination on the listeners' perceptions, emotions, and enjoyment. In planning research on such rather subtle problems in the psychology of music, however, one is faced with the considerable difficulty of finding satisfactory stimulus material. Typically, there is the choice between two barely palatable alternatives. In the "analytic" approach, in Berlyne's terminology (1971; 1974), one relies on authentic pieces of "real" music, and thus

acquires musical credibility, but at the expense of losing experimental control. Also, the altered, control versions of the pieces often end up lacking more than the element of experimental interest. In contrast, in the "synthetic" approach, control over the components of the different versions of the stimulus material is typically achieved at the expense of their being artificial and musically trivial or worse.

The present article is an account of the rather unconventional way in which the author grappled with the psycho-musical and methodological questions outlined above. It is therefore necessary to provide some background information about the source of the material used in the research.

In 1994, wearing the hat of a playwright, the author wrote a performance piece called *Tasol*. The text of the piece is presented as Appendix 1, in the exact form in which it was originally circulated to several avant-garde theatres; the reader is urged to consult it before proceeding with the main body of the article.

One way of thinking about *Tasol* is as a quasi-musical chamber piece with a theatrical ("operatic") resolution. The para-vocal, respiratory aspect vaguely evokes the musical and theatrical uses of breathing in John Cage's "composition" *Solo for Voice 22* (1970), in Samuel Beckett's 1969 micro performance piece *Breath* (see Beckett, 1984), and in the author's earlier (1990) play *St. Jacques-en-Erlian*, 1989 (see Konečni, in press) – in which the character S. B.'s dying moments consist of performing *Breath*.

The first performance of *Tasol* took place in May of 1995 at the Studio 409 Theatre in San Diego, California, which was followed by other performances in California and three European countries. The San Diego performances are described in Appendix 2. As is clear from this description, all aspects of the piece as a quasi-musical composition were maximally emphasized, including the use of a conductor and a score, the manner of execution and delivery of the material, the formal elements of the presentation on the stage, and the comportment of the actors/players.

It seems self-evident which components of this wordless play, or performance piece, or *a cappella* composition for the respiratory system of a sextet of actors (or a six-person choir) are of interest with regard to the two attributes of traditional Western music, mentioned earlier, that the aleatory approach almost always eliminates. *Tasol* consists of four distinct segments, within each of which there is a clear "development" (in terms of frequency/density, urgency, and amplitude of the specified aural events), a climax, and a mini-resolution (codetta). The final segment, in addition to this formula, also contains brief aural references to the earlier segments, and ends with the "death" of the players – a resounding theatrical, rather than purely aural, coda. *Tasol* is thus almost pure abstraction, but with a classical structure.

Given these facts, the author put on the hat of a researcher in psychoaesthetics and decided to use *Tasol* as the source of stimulus material. Without a doubt, the intimate knowledge of the original piece greatly faci-

litated the preparation of the research materials (as described in the *Method* section). The present work is essentially an experimental case-study that explores the region of overlap between the musical and theatrical elements and means of expression from a psycho-aesthetic point of view. The experiment is unique in that it can be regarded as both an independent scientific endeavour that can be replicated by others to verify the psycho-aesthetic findings and as a new theatrical multi-media performance piece, an extension of the original *Tasol*.

Three factors were included in the experimental design:

(1) development/climax (in terms described above) vs. a random distribution of the aural events;

(2) "death" vs. no "death" of the players/instruments at the end of the piece; and

(3) the vocal vs. instrumental delivery of the aural events (the reason for including this third factor, with the instrumental control condition, is discussed below).

The experiment thus had a fully crossed 2 (Dev-Clim/Chance) × 2 (Death/NoDeath) × 2 (Vocal/Instrum), between-subjects, design. Please note that among the eight experimental conditions, it is the Dev-Clim × Death × Vocal combination that is the closest to the original *Tasol*, but with some modifications described in the *Method* section (therefore, "*quasi-Tasol*"). The remaining seven versions were various controls in which the original was modified in aesthetically and psychologically interesting ways.

Some words are in order about the psycho-aesthetic status of the three manipulated variables, specifically in reference to the widely acknowledged scheme of the three classes of stimulus characteristics defined by Berlyne (1960; 1971). With regard to the "psychophysical" stimulus dimension, it is clear that there was a difference in dynamics between the two versions representing, respectively, the two levels of the Dev-Clim/ Chance factor: The method of preparation of the stimulus material virtually insured that the Dev-Clim version was louder at climactic points than the control, Chance, version at the same points in time. On the other hand, the Chance version was by definition more complex and unpredictable (or containing more "uncertainty" in information-theory terms), and thus presumably higher on the "collative" stimulus dimension, than the Dev-Clim version.

In Berlyne's terminology (1971), the third, "ecological," stimulus dimension refers to associations between components of a work of art and biologically important outcomes (usually established by classical conditioning). The two versions representing the Death/NoDeath factor clearly differ on this dimension, for even a theatrical representation of this ultimate human event presumably contains a wealth of powerful, even painful, associations.

The instrumental-delivery control condition (the Vocal/Instrum factor) was included in the research design in order to determine whether the impact of the other two factors, and thus the impact of the original *Tasol*,

depended on the aural events being produced by the human respiratory system. The human mouth and nose, throat and chest, and the sounds (not just voice) emanating from this system – suggesting mirth and well-being (chuckle, laugh) or discomfort (sneeze) or illness (cough) – clearly have a special status for human listeners and are higher on the "ecological" dimension than are the instrumental sources of equally distributed aural events. It was worthwhile to submit the suspected psycho-aesthetic importance of this difference to experimental scrutiny.

In preparing the instrumental version, however, as is made clear in the *Method* section, an effort was made – through the use of toy instruments and other means – to achieve an analogous degree of attributes like "playfulness," "surprisingness," "incongruity," and even "bizzareness," which seem amply to characterize the vocal version.

After viewing a videotape of one of the eight research versions, the subjects evaluated what they had seen on 19 standard psycho-aesthetic rating scales, including "pleasingness," "interestingness," "complexity," and so on. The main prediction, in terms especially of the "pleasing – not pleasing" and "interesting – not interesting" scales was that the version closest on all three of the manipulated dimensions to the original *Tasol* would receive the highest mean ratings. This prediction was made despite some past psycho-aesthetic findings that musical compositions and other artworks can withstand a considerable amount of structural alteration without a negative effect on their appeal (e.g., Cook, 1987, 1990; Konečni, 1984, 1994). *Tasol* is an authentic work for the theatre, but it is an elusive, intuitively-constructed performance piece. Its very short duration is likely to increase the fragility of its aesthetic structure. Perhaps the prediction was unduly influenced by the author's "playwright hat," but it proved correct.

Findings that supported the main prediction would empirically document – by analogy – some of the reasons for the dislike that general concert audiences have apparently continued to feel for musical compositions based on the aleatory and stochastic approaches. Of course, systematic deviations from the prediction would also be informative from musical, theatrical, and psychological points of view.

2. Method

2.1 Research participants

Logistical considerations and opportunities of access made possible the use of four subject samples, at four respective research locations, in three countries, on two continents:

(a) participants, of all kinds of nationalities and ages (25–63), at an international conference on philosophical aesthetics in Lahti, Finland (n =

15; each person was randomly assigned to one of six experimental conditions, which were randomly chosen from the total of eight);

(b) members of a student social club at the University of Rotterdam, the Netherlands, of different youngish ages (20–32) and from different faculties, but with theatre students predominating (n = 12; each person was randomly assigned to one of two experimental conditions, which were randomly chosen from eight; the author thanks Ingeborg Kruithof for carrying out this part of the study);

(c) students of various ages (20–35) at the Sweelinck Conservatorium, Amsterdam, the Netherlands (n = 49; each person was randomly assigned to one of six conditions, which were randomly chosen from eight possible; the author thanks Ton Hartsuiker, Director of the Sweelinck Conservatorium, for his help); and

(d) first-year students (with a modal age of 18) enrolled in introductory psychology at the University of California, San Diego (La Jolla), USA (n = 108; each person was randomly assigned to one of eight experimental conditions; the author thanks Christopher Morales for his help in carrying out this portion of the study).

Overall N was thus 184, with the eight cell *n*s ranging from 19 to 34 subjects. The reason for introducing a two-level aesthetic-experience factor in the statistical analyses, and the manner in which the classification was accomplished, are described at the beginning of the *Results* section.

2.2 Experimental materials

Differences from Tasol. In comparison to the San Diego production of *Tasol*, the analogous research version (i.e., the Dev-Clim × Death × Vocal combination) was simplified as follows: The length was shortened from ten to six minutes; the number of respiratory "products" or modes of expression was cut from four to three (*chuckle* was eliminated, while *sneeze*, *laugh*, and *cough* remained); the number of players was reduced from six to four; the conductor was eliminated, but there was "the first violin" who marked the key points in time; there was no entrance of the players. The performance was videotaped in an unremarkable corner of the author's psycho-aesthetic laboratory suite and the stimulus for the 34 subjects who had been randomly assigned to the Dev-Clim × Death × Vocal condition (*quasi-Tasol*) was a 6-minute black-and-white videotape.

Stimulus videotapes. The score. The first step was to prepare the score for the Dev-Clim × Vocal condition. After the elimination of the *chuckle* section, the remaining *Tasol* was proportionately shrunk into the six-minute format with three sections of approximately equal, 2-minute, duration – with the original order of *sneeze*, *laugh*, and *cough* preserved. Analogously to *Tasol* (where all six players performed all four respiratory modes; see Appendices 1 and 2), each of the four players in the research versions emitted each of the three respiratory products. Across all four

players, there was a total of 48 *sneeze* "attacks," 24 (of which 6 extended) *laugh* attacks, and 28 (12 extended) *cough* attacks. Equally preserved was the fact that within each of the three sections, there were a clear development and climax (as described earlier). The total number, length, and distribution in time of the three respiratory products in the score for the Dev-Clim × Vocal research version was proportional to these parameters in *Tasol*.

The score for the Chance × Vocal condition kept (a) the total number of attacks, (b) attacks in each of the three respiratory modes, and (c) attacks by each of the four players, all exactly the same as in the Dev-Clim × Vocal version. Sustained attacks were treated as individual units and preserved, while the transition sections (between *sneeze* and *laugh*, and between *laugh* and *cough*) were included in the range of possible outcomes. A thorough randomization procedure, performed with the aid of tables of random numbers, dice rolls, and coin flips, determined the onsets of attacks, the distribution of attacks in the three respiratory modes within the three respective 2-minute sections, and the location in time of the sustained attacks. The randomization procedure used for the Chance × Vocal version thus thoroughly destroyed the development and climax aspects of the Dev-Clim × Vocal condition (and, of course, of *Tasol*).

Instrumental versions. Great care was invested in the creation of the instrumental analogues of the vocal versions. The notion originally was to consider the four players as members of a string quartet – with violin, viola, and violoncello being used as instrumental counterparts of the *sneeze, laugh, and cough* respiratory modes, respectively. This initial conception was changed in part because musicians are not necessarily the best actors and also because of the cumbersomeness of all three of these instruments being played by all four players during the short, six-minute, session. The main conceptual reason, however, for the change away from the string instruments, was the idea that *toy* instruments, made for children, more closely conveyed the sense of playfulness and absurdity evoked by the respiratory modes. Toy instruments were also more practical and could be easily and properly used by non-musician players.

Three toy *wind* instruments were therefore used, all three played by all four players during the respective 2-minute sections in the Instrum versions. The instruments were: *saxophone* (the first section, as the counterpart of *sneeze*), *harmonica* (the second section, the counterpart of *laugh*), and *whistle* (the final section, the counterpart of *cough*). On the toy saxophone, the sounds are produced by means of a blown, vibrating, plastic "reed." The available pitches are a triad with an additional fifth on the bottom; with four playable notes, this is the least flexible of the three instruments and thus analogous to *sneeze*. A blown or drawn, vibrating, plastic "reed" produces the toy harmonica sounds. The number of pitches that could be produced varied somewhat across the four identical-looking harmonicas that had been purchased. The maximum was twelve pitches, which was frequently diminished due to duplication by means of blown

and drawn breaths; harmonica was the instrument of medium flexibility. The means of sound production by the whistle is a blown, vibrating air column; since it can produce the pitches of the full chromatic scale, with the range of approximately two octaves, this was the most flexible of the three toy instruments.

The whistle, instead of a "reed" instrument, was chosen as the analogue of *cough*, because its energy content and urgency provided a more effective and dramatic ending of the Instrum versions. This attribute of the instrument being able to convey the character of *cough* was considered more important than basing the instrument selection entirely on an approximate rendering of the relative pitch of the three respiratory modes.

As a further rough analogy to the vocal versions, it was decided that each of the twelve player × instrument combinations should be identified by a single, and unique, pitch. In other words, each of the four players had his or her own saxophone, harmonica, and whistle, and on each of these instruments the player could produce only one pitch – one that was not available to him or her on the other two instruments, and that was also unavailable to the other three players on any of their three instruments. (Performance ease and accuracy on all the instruments were insured by using masking tape to block the production of undesired pitches.) The pool of twelve pitches used across all players and all instruments in the Instrum versions consisted of A, Bb, B, C, C#, D, Eb, E, F, F#, G, and G#, with the assignment of the twelve pitches to the twelve player × instrument combinations being random except for the constraints of no pitch duplication and the limitations in terms of instrument type.

The actual pitch values for the instruments were (the author thanks Tom Alexander of the UCSD Music Department for this information and, generally, for his invaluable help with the selection and preparation of the toy instruments): The four *saxophones*: b4 −06 cents, c#4 +35 cents, g4 +14 cents, and d5 +54 cents; the four *harmonicas* : f#4 +38 cents, g#4 +28 cents, a#4 +00 cents, and c#5 −22 cents; the four *whistles*: a#5 −20 cents, b5 +11 cents, c#6 −44 cents, and d#6 −8 cents.

Given the described relationships between the three respiratory modes and the three toy instruments, it was a straightforward task to create the scores for the Dev-Clim × Instrum and Chance × Instrum versions: They were the exact translations of those for the Dev-Clim × Vocal and Chance × Vocal conditions, respectively.

Death/NoDeath factor. The Death endings in the Dev-Clim × Vocal and the Chance × Vocal conditions were the same, and similar to that in *Tasol*: All four players simultaneously collapsed. In the two analogous NoDeath conditions, the performances simply came to an end with the players' last coughs.

Even if the whistle is seen as an instrumental analogue of *cough*, the players using it, unlike the coughing ones, can hardly be suspected of suffering from a physical ailment, and therefore it seemed inappropriate for the Death ending in the Dev-Clim × Instrum and the Chance × Instrum conditions to

take place in the same way as in the two analogous Vocal versions. Instead, the Death ending in the Instrum conditions was vaguely conceptualized as "death of the instruments," which were vehemently thrown to the floor by the players after the last whistle sounds had been produced.

In contrast, the Dev-Clim × NoDeath × Instrum and the Chance × No-Death × Instrum versions had simple endings analogous to those in the two NoDeath × Vocal conditions.

Preparation of videotapes. To insure that the appearance of the players (in terms of make-up, hair-style, and clothes) did not change from condition to condition, all eight research versions were videotaped in one session in the author's laboratory (the author thanks David Demsey for the camera work). The four players, students in their early twenties, wore simple, uncoordinated clothes, and were seated in a semi-circle facing the camera. From left to right, from the viewpoint of the camera, male and female players alternated: Tom Alexander ("first violin"), Brigitte Elfman, Kenneth Cerniglia, Amy Keenan (the author thanks them all).

The performances were carefully rehearsed by Tom Alexander and Kenneth Cerniglia (the author also thanks Amy Stewart for her help as the acting coach). In front of each player there was a music stand on which stood the score, a stopwatch, and – for the four Instrum versions – the three toy instruments. The camera distance and angle were such that the entire figures of all four players, as well as the music stands, were recorded on videotape throughout all eight six-minute versions. If a mistake was made, the condition was recorded again from the beginning (no splicing was used). The "first violin" signaled the beginning and end of a version; otherwise, the players followed their own lines in the score and timed their entrances with the help of stopwatches.

2.3 Procedure and the dependent measures

At all four research locations, the potential research participants were recruited by written notices inviting people of unspecified attributes "to participate in research in psychological aesthetics," in which they would "watch a videotape and anonymously give evaluations of it." At all locations, the viewing took place in a comfortable, dimly-lit room, with widely spaced chairs. Subjects watched one six-minute version (in black-and-white) – to which they had been randomly assigned prior to their arrival – after being asked not to talk to each other, make comments, or otherwise be expressive during the viewing. They watched the videotape in small groups ranging from two to seven participants. At none of the viewings was there any untoward event that could have affected the results.

After the viewing, the research participants were again asked to refrain from talking and given sheets with nineteen 100-mm rating scales. The respective end-points of the unsectioned 100-mm lines had the following designations: Pleasing – Not Pleasing; Interesting – Not Interesting; A

Lot of Structure – Very Little Structure; With Many Climaxes – No Climaxes; Musical – Not Musical; Theatrical – Not Theatrical; Rhythmic – Not Rhythmic; Sensitive – Insensitive; Disturbing – Not Disturbing; Irritating – Not Irritating; "Human" – "Not Human;" Orderly – Disorderly; Predictable – Unpredictable; Complex – Simple; New – Familiar; Powerful – Lacking Power; Planned – Random; Strange – Ordinary; Exciting – Relaxing.

These designations were used for the international sample at the conference in Finland and, obviously, at the University of California, San Diego. For the Rotterdam and Amsterdam samples, the designations were translated into Dutch.

All 19 scales were listed above for the sake of completeness of description of the subjects' task. Much of the discussion, however, will focus on two of the scales, "pleasingness" and "interestingness." These have been generally recognised as the main dimensions of hedonic appeal and consequently the main prediction, specified earlier, was in terms of these two scales. The findings on the other scales will be used as aids to interpretation of the main results and as checks on the success of the experimental manipulation (regarding the construction of the seven control versions).

3. Results

Because of the exploratory nature of the work, the principal interest was in robust effects that could be obtained with "mainstream," reasonably well-educated, youngish adults. An initial decision was therefore made in this research project not to treat systematically the subjects' experience in the arts, and their musical and theatre background, as formal experimental variables. This would, of course, increase "error" variance, but also the confidence that the statistically significant results would generalize to a relatively broad audience spectrum (cf. Swain, 1994, and Konečni's *postscript* in Konečni & Karno, 1994).

However, for the available data, already the preliminary analyses of the pleasingness and interestingness responses using different samples revealed a massive and, moreover, *differential* (comparing the two scales) effect of what is probably best called "the amount of aesthetic experience." It became obvious that without an at least two-level classification of subjects (samples) on this dimension, too much substantively important information would be lost in error variance.

The aesthetically experienced (AE) level was comprised of the total of 76 subjects in the Lahti (aesthetics conference participants), Rotterdam (mostly theatre students), and Amsterdam (Sweelinck Conservatorium students) samples, whereas the aesthetically less-experienced (ALE) level contained the 108 first-year psychology students at the University of California, San Diego. It goes without saying that the Aesthetic Experience factor is completely confounded with both the subjects' continent of origin

and age (see *Method*). Yet the chosen factor designation and the manner of classification are defensible on both intuitive and statistical grounds that one does not need to belabour here.

3.1 Pleasingness

A 2 × 2 × 2 × 2 ANOVA on the "pleasing – not pleasing" responses revealed a number of statistically significant effects. The results are best presented with reference to the three panels of Table 1. In the top panel are given the eight means from the three-way interaction of the manipulated experimental variables: Dev-Clim/Chance × Death/NoDeath × Vocal/Instrum. In the middle and bottom panels, respectively, are the simple interaction effects for these three factors at the AE and ALE levels of Aesthetic Experience.

Table 1

Mean "Pleasingness" Ratings By Experimental Condition (*N* = 184)				
	Development + Climax		Chance	
	Death	No Death	Death	No Death
Vocal	42.8	29.3	39.2	30.6
Instrumental	36.7	30.9	30.4	23.8
Mean "Pleasingness" Ratings By Experimental Condition (76 Aesthetically Experienced Subjects)				
	Development + Climax		Chance	
	Death	No Death	Death	No Death
Vocal	51.6	21.5	45.6	31.0
Instrumental	44.4	38.1	42.5	30.3
Mean "Pleasingness" Ratings by Experimental Condition (108 Aesthetically Less Experienced Subjects)				
	Development + Climax		Chance	
	Death	No Death	Death	No Death
Vocal	34.0	37.1	32.7	30.3
Instrumental	28.9	23.6	18.3	17.4

Both the Death/NoDeath [$F(1,168) = 7.10$, $p < .008$] and the AE/ALE [$F(1,168) = 10.26$, $p < .002$] factors were significant: The "death" ending was rated as more pleasing, M = 37.3 mm, than the no-death one, M = 28.7 mm (here and throughout with reference to a 0–100 mm scale, with measurements from the "negative" end; the bigger the number, the more "positive" the rating). The pleasingness ratings given by the AE group were considerably higher, M = 38.1, than those given by the ALE subjects, M = 27.8.

The main effects of Dev-Clim/Chance [M = 34.9 for Development + Climax, 31.0 for Chance, $F(1,168) = 1.46$, $p = .23$] and Vocal/Instrum [M = 35.5 for Vocal, 30.4 for Instrumental, $F(1,168) = 2.42$, $p = .12$] were not statistically significant, but the latter factor was involved in a significant two-way interaction with the AE/ALE variable [$F(1,168) = 3.95$, $p < .05$]. A cogent interpretation of this effect is that the strong finding of lower pleasingness ratings given by the ALE subjects, compared to the AE group, was far more pronounced in the case of instrumental, as opposed to vocal, versions, thus making the Instrum-ALE cell by far the lowest of the four (M = 22.1).

The Death/NoDeath factor also interacted significantly with AE/ALE [$F(1,168) = 4.99$, $p < .03$]. In this case, the versions with the "death" endings, when viewed by the AE subjects, produced by far the highest pleasingness ratings (M = 46.1), with the means of the other three cells in the 27–30 region. All other two-way and higher-order interactions did not approach statistical significance.

Keeping the above results in mind, it is instructive to scrutinize the three panels in Table 1. Exactly as had been somewhat optimistically predicted, the "*quasi-Tasol*" version, that is, the three-factor combination most resembling the original theatre piece, received by far the highest pleasingness ratings among the eight versions [top panel; *quasi-Tasol* = 42.8; M of Ms of the other seven conditions = 31.6; $F(1,168) = 7.78$, $p = .006$, for the planned weighted contrast). The implication of including the Aesthetic Experience factor in the analysis is obvious when the middle and bottom panels are compared to the top one and to each other. The unique pleasingness status of *quasi-Tasol* was due entirely to the ratings by the AE subjects [in the middle panel: 51.6 compared to the average of 36.2 for the other seven versions; $F(1,168) = 7.67$, $p = .006$]. In sharp contrast, the ALE subjects (bottom panel) showed no special preference for *quasi-Tasol* [$F(1,168) = 1.48$, $p = .23$, for the weighted comparison].

Nevertheless, it is also informative to examine the data with the Aesthetic Experience factor omitted from the analysis. With no interaction terms approaching statistical significance, the main effects of all three experimentally manipulated factors are significant or marginally significant in the direction favoring the constituent elements of *quasi-Tasol*: For the Dev-Clim/Chance factor, $F(1,176) = 2.83$, $p = .09$; for Death/NoDeath, $F(1,176) = 5.19$, $p = .02$; and for Vocal/Instrum, $F(1,176) = 5.23$, $p = .02$. The three variables thus additively contribute to *quasi-Tasol* – that is, the Development + Climax × Death × Vocal factorial combination – being rated the most pleasing of the eight versions [$F(1,176) = 10.47$, $p = .001$, for the weighted contrast].

3.2 Interestingness

The 24 ANOVA of the results on the "interesting – not interesting" response scale revealed that here the Aesthetic Experience factor had no statistically significant impact either as a main effect [F(1,167) = 1.40, p = .24] or in any interactions. However, since the AE subjects did again give somewhat higher ratings (M = 41.3) than the ALE subjects (M = 36.6), and for ease of comparison with the pleasingness results, the contents of Table 2 are analogous to those of Table 1.

Table 2

Mean "Interestingness" Ratings By Experimental Condition (*N* = 183)				
	Development + Climax		**Chance**	
	Death	**No Death**	**Death**	**No Death**
Vocal	56.0	30.9	41.1	46.3
Instrumental	39.9	36.9	32.1	28.4
Mean "Interestingness" Ratings By Experimental Condition (75 Aesthetically Experienced Subjects)				
	Development + Climax		**Chance**	
	Death	**No Death**	**Death**	**No Death**
Vocal	62.8	25.4	44.1	49.1
Instrumental	38.1	37.7	36.6	36.5
Mean "Interestingness" Ratings by Experimental Condition (108 Aesthetically Less Experienced Subjects)				
	Development + Climax		**Chance**	
	Death	**No Death**	**Death**	**No Death**
Vocal	49.3	36.5	38.1	43.5
Instrumental	41.6	36.2	27.6	20.3

Several important findings were obtained in the four-factor ANOVA. The vocal versions (M = 43.6) were rated as more interesting than the instrumental ones [M = 34.3; F(1,167) = 5.47, p = .02]; endings involving "death" were found somewhat more interesting (M = 42.3) than the uneventful ones [M = 35.6; F(1,167) = 2.81, p < .10]; and, moreover, the Death/NoDeath variable was involved in two important, easily interpretable, higher-order interactions.

The Dev-Clim/Chance × Death/NoDeath interaction [F(1,167) = 3.47, p = .06] showed that the subjects found versions in which development resulted in a climax, followed by "death," as far more interesting (M = 47.9 for the Dev-Clim × Death combination) than the other three conditions (Ms ranging from 33.9 to 37.3); however, this result is more completely understood in the light of the significant three-way interaction in-

volving these two factors and the Vocal/Instrum variable [$F(1,167) = 3.85$, $p = .05$; see the top panel in Table 2].

Quasi-Tasol emerged again as the by far most highly rated version. Unlike the results for pleasingness, however, this was true for the sample as a whole, and for *both* the AE and the ALE sub-samples [the top panel in Table 2: $F(1,167) = 15.27$, $p < .001$, for the planned weighted contrast; the middle panel: $F(1,167) = 12.45$, $p < .001$; and the bottom panel: $F(1,167) = 4.08$, $p = .045$]. The Vocal/Instrum and Death/NoDeath factors contributed additively to the interestingness of *quasi-Tasol* – with the Vocal/Death combination the highest – while the Dev-Clim level of the Dev-Clim/Chance variable essentially multiplied the sum in the three-way interaction.

To summarize the results on this rating scale: Sneezing, laughing, and coughing were interesting only when they gradually developed into a climax followed by "death." A developing and climactic, dreadfully-sounding, coughing fit *not* followed by "death" was almost the *least* interesting of the eight versions ($M = 30.9$). Respiratory activities in which there was no development and no climax were, in fact, somewhat less interesting when they ended in "death" than when they did not. Finally, all of these findings were especially pronounced in the aesthetically experienced sample.

3.3 Quasi-Tasol on other rating scales

The prediction that the research version closest to the original, authentic theatre piece would be rated as the most pleasing and interesting was confirmed. The correlation between the two responses was quite high, especially for the aesthetically less experienced sample ($r = .60$ for 183 subjects; $r = .51$ for the 75 AE subjects; $r = .67$ for the 108 ALE subjects), but well within the range characteristic of past psycho-aesthetic studies on a wide variety of artistic stimuli (e.g., Sargent-Pollock & Konečni, 1977).

What follows is a summary of how *quasi-Tasol* fared on the other 17 rating scales, based on the weighted contrasts between this condition and the other seven versions. In these comparisons – for the entire sample of 184 subjects –*quasi-Tasol* was rated as more musical, more theatrical, more rhythmical, with more climaxes, more sensitive, more "human," and more powerful than the aggregate of the other versions (ps ranging from .001 to .03). In addition, with the exception of the "sensitive – not sensitive" scale, where its mean was the second highest, *quasi-Tasol* was in fact the most highly rated condition on all of the above seven scales.

Such results for the sample as a whole conceal a profound difference between the AE and ALE sub-samples. When comparisons between *quasi-Tasol* and the other seven conditions were performed for the two sub-samples separately, *quasi-Tasol* was rated significantly more highly than the aggregate of the other seven versions (ps ranging from .001 to .02; for "sensitivity," $p < .04$) *only by the AE subjects*, who also gave it the highest

rating on six of the seven scales (the second-highest on "sensitivity"). For the ALE sub-sample, on the other hand, the contrast between *quasi-Tasol* and the other seven conditions did not reach even the 10 % probability level on six of the seven scales ($p < .07$ on the seventh, "sensitivity" – in favor of *quasi-Tasol*). Even on the "climaxes" dimension, the only one of the seven, other than "sensitivity," on which these ALE subjects rated *quasi-Tasol* the highest, the probability was .12.

While it is true that the ALE subjects did not rate *quasi-Tasol* lower than third on any of these scales (fourth on "theatricality"), clearly their preference for it was far less pronounced than in the case of the AE subjects. "Interestingness" thus remained the only of 19 scales on which the aesthetically less experienced subjects rated *quasi-Tasol* higher than the aggregate of the other seven conditions at the 5 % probability level.

It is self-evident that high scores on dimensions such as musicality, rhythmicality, theatricality,"human-ness," sensitivity, and power are very desirable if a theatre piece of a quasi-musical type is to "work," that is, in the context of the present experiment, to be rated as highly pleasing and interesting. Without, of course, imputing causality or even resorting to formal factoring and clustering methods, one can state confidently that there exists among these scales a web of judgments that helps understand the great hedonic advantage that *quasi-Tasol* – as an *artwork* – has over the seven control versions, at least for the aesthetically experienced sub-sample.

The correlations between pleasingness and interestingness, respectively, and the above six scales were all positive for the sample as a whole (in the case of pleasingness, the range was .13 – .32; for interestingness, .27 – .37). For the AE sub-sample, the correlations were somewhat higher, on the average,than for the ALE sub-sample, and with a greater range (AE-pleasingness: .04 – .59, M = .29; ALE-pleasingness: .13 – .32, M = .22; AE-interestingness: .21 – .62, M = .40; ALE-interestingness: .25 – .38, M = .30). "Powerfulness," in the AE sub-sample, was correlated .59 with pleasingness and .62 with interestingness – the only correlations that exceeded .44 and equaled the correlation of pleasingness and interestingness with each other.

On the 10 rating scales where *quasi-Tasol* did not differ significantly from the aggregate of the other seven conditions, there was also no systematic preference for any of the control versions. Furthermore, the pattern of correlations between pleasingness and interestingness, respectively, and many of these 10 scales directly or indirectly supported the conclusion of a special hedonic status of *quasi-Tasol.* Both pleasingness and interestingness had significant negative correlations with "irritatingness" and "disturbingness" (-.29 to -.45), and both had correlations around zero with "strangeness," as well as with a block of four correlated dimensions consisting of "structuredness," "orderliness," "predictability," and "plannedness." Such findings not only make sense and help interpretation, but also suggest that the subjects were alert throughout the rating task.

3.4 Some auxiliary findings

On the scales of "sensitivity" and "climaxes," there were statistically significant (at $p < .05$) three-way interactions between the experimentally manipulated variables of the form that almost exactly matched the "interestingness" results in all three panels of Table 2 (that is, for both sub-samples). The latter result, on the "climaxes" dimension, is of particular interest.

If one views the "climaxes" scale as providing a "check on the experimental manipulation," it is clear that the orthogonality of the three factors in the experimental design did not insure the orthogonality of the subjects' *perceptions* of the occurrence of climaxes. Instead of there being obtained a single main effect – such that a greater number of climaxes is perceived in the Dev-Clim-half of the design and equally so in all the Dev-Clim versions – the various statistically significant interactions lead to the following conclusions: (a) In conditions where the climaxes actually occurred (the Dev-Clim versions), subjects reported hearing more climaxes in versions that ended in "death" than in the "no-death" versions, and this difference was especially pronounced when the material was vocal – all this despite the objective equivalence of these versions in the number of climaxes; (b) where the climaxes were, in fact, eliminated (the Chance versions), subjects again claimed to have heard more of them in conditions with "death" endings, but only when the material was instrumental: The reverse finding was obtained in the vocal versions, so that the Chance/No-Death/Vocal condition was the second-highest of the eight for the sample as a whole [47.1; the Dev-Clim/Death/Vocal version (*quasi-Tasol*) was the highest, 48.5, and the Dev-Clim/Clim/Instrum version the third, 41.2].

In short, the subjective perception of the occurrence of climaxes was highly malleable and depended more on other manipulated factors (that is, in what medium the material was presented and what it ended with) than on either the objective existence or frequency of the climactic events. (To complicate matters further, the AE and the ALE sub-samples differentially perceived the frequency of climaxes as a function of context – there were two significant two-way interactions involving the AE/ALE variable that need not be discussed further here.)

The Dev-Clim/Chance factor was also involved in an interesting interaction with the Death/NoDeath variable on the "human – not human" dimension. For both the vocal and instrumental versions, and in both sub-samples, the significant two-way interaction ($p < .05$) indicated essentially that climaxes were perceived as more human than their absence *only when they resulted in "death"* (the Dev-Clim/Death cell, 51.6, was the highest of the four). This interaction mediated the interpretation of a significant main effect of the Death/NoDeath factor ($p < .05$): As another check on the manipulation, the "death" outcomes were quite reasonably perceived as more human than their absence.

The results on the "human – not human" dimension also confirmed the expectation that the versions with respiratory activities would be judged

as more human than the instrumental versions [$F(1,168) = 8.19$, $p < .005$, for the Vocal/Instrum main effect; this factor did not interact with any others]. The perceived "human-ness" was only one of five scales on which the raw sounds emanating from the human throat and nose were judged significantly higher than the analogous ones using toy instruments, the other four being interestingness, rhythmicality, excitingness, and power (all $ps < .03$). (Instrumental versions were not judged significantly higher on any of the 19 scales.)

Finally, readers might be interested in the results on the hitherto unmentioned "new – familiar" and "complex – simple" scales, which – as important "collative" variables (Berlyne, 1960; 1971) – have been the focus of much psycho-aesthetic research. In fact, these dimensions can be thought of as checks on the AE/ALE classification variable. As one might have expected, the AE subjects rated the stimulus material *in toto* as considerably less new and and less complex than did the ALE subjects [for the "new – familiar" scale, $F(1,168) = 16.19$, $p < .001$, $M_{ae} = 52.2$, $M_{ale} = 69.0$; for the "complex – simple" scale, $F(1,168) = 8.10$, $p = .005$, $M_{ae} = 34.4$, $M_{ale} = 45.5$]. On the complexity scale, the AE/ALE factor did not interact with any other and there were no other significant results. On the "newness" scale, there was only an additional two-way interaction between the AE/ALE and the Vocal/Instrum factors [$F(1,168) = 5.18$, $p < .025$], such that the AE sub-sample rated the vocal versions as more new than the instrumental ones ($M_{voc} = 56.1$, $M_{ins} = 48.3$), whereas the opposite was the case for the ALE sub-sample ($M_{voc} = 63.4$, $M_{ins} = 74.6$). The correlation between newness and complexity was .26 for the sample as a whole (.35 for the AE sub-sample, .12 for the ALE subjects).

4. Discussion

To begin with, two technical points are in order. The first concerns the fact that the AE subjects rated *quasi-Tasol* 51.6 on the pleasingness scale (Table 1) and 62.8 on interestingness (Table 2). It could be somewhat naïvely argued that in absolute terms, given 100 mm rating scales, these hedonic ratings are low. There are several responses to this: (a) The subjects were instructed, for statistical reasons, to avoid scale ends (a standard procedure); (b) *quasi-Tasol* is, after all, theatrically and musically a paler, abbreviated, black-and-white video version of the live *Tasol* (as was described in detail in the *Method* section); and (c) *Tasol* and *quasi-Tasol* are experimental, relatively inaccessible, pieces.

The second point concerns the perennial issue of the appropriate sophistication of subjects used in music psychology experiments and in empirical psycho-aesthetics in general. The choice of subjects reflects in part the researcher's intention and entitledness to generalize. Recently, Smith (1997), after reviewing the broad domain of musical novices' "insensitivity," argued – essentially for reasons of generalizability – in favor of an

amended musical science that would include the novice. In a series of studies on the effects of global structure in music, Konečni and Karno (1994) demonstrated that the findings were independent of the subjects' musical training and sophistication. On the other hand, in studies of the significance of the "golden section" in visual art, Konečni (1997) obtained the effect only with painters as subjects and under highly circumscribed conditions. Cook (1990) reported that even advanced university music students were not influenced by the lack of tonal closure in pieces longer than a minute, nor were they able to detect "literal repeats." And in Repp's (1996) study of the detection of pianistic errors, the subjects were pianists who had recently studied the test piece and who nevertheless detected only 38 % of the errors.

In short, for many aesthetic phenomena, it is close to impossible to know ahead of time precisely what level of the subjects' artistic training and aesthetic experience is necessary for an effect to be empirically demonstrated. In the present work, fortunately, the circumstances of access to research participants secured a relatively broad range of relevant backgrounds. Thus, although the initial intention was to ignore the subjects' sophistication for reasons of generalizability, when aesthetic experience appeared to be important in the preliminary analyses there was a sufficient number of subjects over a broad range of experience to introduce at least a two-level classification (AE/ALE).

The introduction of this classification turned out to be crucial. In terms of "pleasingness" and a number of other dimensions that aided the interpretation of *quasi-Tasol*'s appeal, the research would have been considerably less conclusive and informative had only the less experienced sample been used. Yet, on the important dimension of "interestingness," aesthetic experience played a much smaller role.

Tasol was conceived and has been performed as a quasi-musical, paravocal piece with theatrical elements, the latter not uncommon in contemporary art music. Alternatively, it can be viewed as a piece of theatre with a strong musical emphasis in both appearance and structure. Either way, it is an example of post-post-modern performance art. *Tasol* eschews even the rudiments of language, yet attempts to instil humanity to its *a cappella* "music" by ignoring aleatoric and stochastic ideas through the use of classical means – development, codettas, and coda.

The brevity and the title of the piece are not arbitrary either. The title is a word that means "that's all" or "all there is" in the Papua New Guinea "Pidgin English" – a language imposed by colonialism on one of the most (so-called) primitive peoples on the planet – and I used it in order to express the idea that although human life may be basic, brutish, and brief, it has structure and meaning. Chance and chaos are "for the birds," or, more precisely, for the unpredictability of feathers falling in a vacuum.

The present research is, to my knowledge, the first in the literature to apply the experimental methodology and measurement techniques of psychological aesthetics to "stimulus material" that at least approximates an

entire and intact, legitimate piece of performance art. Another unusual aspect of the research is that the same person was both the playwright and the psycho-aesthetic researcher. One of the most important objectives of the work was to demonstrate that the methods of empirical psycho-aesthetics can be used – more objectively than the sometimes tendentious deconstruction techniques à la Derrida – to analyse the structure and the constituent elements of a theatrical or musical artwork.

Quasi-Tasol, a research approximation of the original piece, was found to be far more pleasing and interesting than the alternative control versions. The results on other rating scales broadened the interpretation and clarified the effects of the three manipulated experimental variables. Together, these findings are a coherent set, especially when the aesthetic experience of the subjects is taken into account.

Apart from providing a rare, perhaps unique, experimentally-based vindication of the way in which an original piece was – *intuitively* – constructed with regard to hedonic appeal, the research reported here allows an albeit brief and incomplete, but nevertheless informative, glimpse into the possible motivation for the distaste that all but the most rarefied contemporary audiences have for music based on aleatory principles.

Furthermore, with regard to the hedonic appeal of *quasi-Tasol*, it is important to note that the effect of the Classical and Romantic (if this is not oxymoronic to sneezing and coughing) idea of development and climax was dependent on both (a) the emotional context (that is, the medium of presentation: respiratory sounds as opposed to those of toy instruments) and (b) the logical context (a theatrical, acted-out "death" resolution, as opposed to a "musical," non-committal lack of resolution). The inability of the orthogonal experimental design to create climaxes such that they would be perceived accurately and independently of context tentatively suggests that it may have been the subjects' (both male and female) lifelong preoccupation and enjoyable involvement with the correlational web composed of the medium and outcome of climaxes that precluded this variable's experimental "extrication in pure form."

This is important substantively and methodologically; it is also a partial rebuttal on several obvious levels to the feminist critique of the allegedly capricious (and oppressively "patriarchal") preference for the use of climaxes in especially the 19th-Century Western music.

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Appendix 1

Tasol ("Tasol" = "That's all" = "The Only Thing" = "All there is" (in the *lingua franca* of Papua New Guinea): A 10-min performance piece

Tasol

[Six actors are seated in a semi-circle, somehow oriented toward each other in an irregular pattern. The audience is at the open end of the semi-circle. The actors are all nondescript adults; beyond that their characteristics are irrelevant. Uniformity along any descriptive dimension should be neither emphasised, nor broken at all costs. No one speaks throughout. No one moves throughout, except to support the vocalisations described below. The actors' demeanour must never be agitated, let alone frantic. They calmly accept their fate. The light, the set – minimal, if any – must be placid.

The piece should be treated as a musical composition, performed *a cappella* by a six-person choir, for the voluntary (chuckles, laughs) and involuntary (sneezes, coughs) products of the nose, mouth, and respiratory system. One possible directorial decision would be to include a conductor and have the actors read from a score.]

Time 0–2'30''

After the audience hushes itself, there is 15–20'' of total silence and immobility. Then, an actor sneezes. Silence for 4–5'.

Another actor sneezes. Silence for 3–4". Yet another actor sneezes. Silence for 2–3''. Two other actors sneeze simultaneously. Longish silence.

The next 1'50'' consist of irregularly spaced sneezing. All of the actors do it. The sequence, intensity, and simultaneity are unpredictable. However, the frequency and intensity of sneezing gradually build to a crescendo at about 1'30'', then diminish for 30''.

During this half-a-minute, the first 3–4 chuckles occur, emitted by different actors.

Time 2'30''–4'30''

As sneezes decrease in frequency, then disappear altogether in the first 15–20'' of this period, the number of chuckles increases gradually, but unpredictably, distributed over all the actors. The peak of chuckling is reached at about 4'00'', after which they become more sporadic during the next 30''.

During this 30'', the first 3–4 laughs occur.

Time 4'30''–6'30''

The frequency, intensity, distribution, and simultaneity pattern described for the previous period is roughly repeated. Now the chuckles gradually disappear, whereas the laughs increase in number, loudness, duration, and variety until a side-splitting cacophony is reached at about 6'00''.

In the next 30'', the laughs diminish. The first 3–4 coughs are heard.

Time 6'30''–9'30''

In the first minute of this, longer, "movement", the coughs increase, the laughs decrease and disappear. A few subtle, distant sneezes and chuckles are heard, like fragments of long-forgotten airs heard in childhood. After the 7'30'', only the coughs remain. The coughing intensifies in every conceivable aspect until a vicious, choking, wheezing, lung-rending, blood-spitting riot of respiratory torture is reached at 9'30''.

Time 9'30''

At exactly the same instant, all six actors die. Some remain seated, but with broken necks as if from karate chops, others crash urgently, noisily. Their suffering is over.

A couple of paramedics walk in with a stretcher. On the canvass is painted "Tasol."

Lights out.

Appendix 2

The San Diego Performances of *Tasol* (May-June 1995)

The "score." For these performances, the author prepared a score on the basis of the script presented in Appendix 1. The score was on music-notation paper, written for six players. Bars indicated 5-second intervals; a 10-minute total length of the piece was specified. The type of event (sneeze, chuckle, laugh, cough) and its duration was indicated for each player. The score was used in rehearsals by the director, Kenneth Cerniglia (who also served as the conductor in the performances), and the six actors/players – three women (Elise Langer, Brooke Nuell, Danielle Pessis) and three men (Brian Heller, Mark Novom, David Sussman).

The performance. There was nothing in the announcements and program notes to prepare the audience for what was to happen. Since performances took place in a studio theatre, a play could reasonably be expected, especially since *Tasol* shared the evening bill with a well-known one-act play. The title was "clarified" in the program exactly as specified on the first page of Appendix 1.

On the well-lit stage, there were six chairs arranged in a semi-circle, facing the audience. In front of each chair, there was a stand with the score on it. There was a podium for the conductor, also with the music stand. The actors/players walked in purposefully as would musicians. They were all dressed in formal black clothes. After a short pause, the conductor walked in and took his place on the podium. All the ritualistic behaviours of a small chamber ensemble with a conductor were observed (but not exaggerated), including the player/conductor interactions.

The conductor signalled the beginning and proceeded genuinely to beat time with a conventional motion of the right hand. The players paid attention to the score and the conductor, and did not "emote;" they wore blank expressions as would some reserved classical musicians, except for the facial configurations that were necessary to produce the respiratory events (as, for example, a flautist would be forced to do, no matter how undemonstrative otherwise).

At the end of the formally executed piece, the conductor froze, the players collapsed to the floor in unison, and the lights went out. (The director of the San Diego performances decided to omit the final detail with the paramedics and the stretcher that is described in the script in Appendix 1.)