

**DETECTING THE DIFFERENCES IN JAZZ:
A COMPARISON OF METHODS FOR ASSESSING
PERCEPTUAL VERIDICALITY IN APPLIED AESTHETICS**

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ABSTRACT

Applied aesthetics raises questions concerning the relationship of aesthetic appreciation to the underlying artistic features that can be manipulated in creating works of art. To the extent that subjective aesthetic judgments and objective artistic characteristics correspond, the process of communication is characterized by "perceptual veridicality." This degree of correspondence should be studied using real as opposed to artificially-constructed artworks and may be measured by either compositional or decompositional methods. By hypothesis, compositional approaches indicate the extent to which subjects *can* detect objective stimulus characteristics while decompositional techniques show the degree to which they *do* make such accurate distinctions. This hypothesis is tested on a set of real jazz recordings, with perceptual veridicality measured by mean squared canonical correlations between objective stimulus characteristics and perceptual maps derived by both compositional and decompositional methods. As expected, the compositional approach provides the better statistical fit. This result suggests that, as an assessment of veridicality, the compositional technique should be regarded as a measurement of cognitive capability rather than as an index of normal perceptual performance in aesthetic appreciation.

A central question in applied aesthetics—perhaps *the* central question—concerns the relationship between an artwork's objective features and the subjective perceptual responses of its audience. This issue has long fascinated philosophers of art criticism [1]. Its obvious practical importance to artists and to managers of arts organizations stems from their frequent need to design artistic offerings intended to elicit certain appreciative reactions from the consumer. For

example, by manipulating variable features of a work of art, one may hope to establish a favorable market position relative to competition [2, 3]. This marketing principle is well understood by consumer researchers [4-14]. Similarly, in applied aesthetics, the psychophysical relationships between artistic features and aesthetic responses may help guide the creative process in the direction of market success. This potential application of consumer aesthetics therefore motivates the empirical investigation of the linkages between objective stimulus properties and subjective perceptions.

Recent work [15, 16] has investigated such links between objective artistic features and subjective aesthetic perceptions in the case of artificially-constructed piano performances of a piece by Bach (the "Allemande" from his *English Suite in G-Minor*). This study examined the perceptual veridicality of consumers' aesthetic judgments by focusing on the accuracy with which subjective perceptual ratings reflected objectively manipulated aspects of performance style. Specifically, subjective aesthetic judgments on structured rating scales were first used to construct a perceptual map (by means of techniques described later). A measure of the correspondence between this spatial representation and objectively manipulated artistic features was then derived (again, using methods discussed later). Clearly, such measures of perceptual veridicality are of enormous potential interest in applied aesthetics. However, the use of artificial stimuli and structured rating scales raises some issues that deserve further empirical investigation. This paper explores these issues, describes the relevant procedures, and illustrates measures of perceptual veridicality that may prove useful in research on applied aesthetics.

Perceptual Veridicality and the Problem of Representative Design

Perceptual veridicality may be defined generally as the degree to which subjective perceptions correspond to objective characteristics in a set of stimuli. In the case of aesthetic appreciation, for example, perceptual veridicality prevails when artworks perceived as similar share objectively verifiable features.

The investigation of perceptual veridicality was central to the work of Brunswik [17-19], whom Edwards [20] has designated "probably the most underrated psychologist of the 1937-1955 period" and potentially "the most important psychologist of the first half of the 20th Century." Brunswik's "Lens Model" represented achievement (i.e., accuracy) in matching inferences (i.e., perceptual responses such as judgments of size) to criteria (i.e., distal stimuli in the environment such as actual magnitudes of physical objects). His model thereby laid the groundwork for two great lessons concerning research on perception.

First, Brunswik adopted a single-mindedly achievement-oriented view of perception in which "the perceptual system appears as a complex instrument

aiming at a mapping of the distal environment into the organism." [19, p. 145] Thus, he advocated a functionalist study of human performance in attaining perceptual veridicality:

Within the functionalist framework the emphasis is on positive achievement, i.e., "veridical" perception. . . . The treatment of cognitive processes as organismic achievements is the hallmark of Brunswik's functionalism [21, pp. 538, 557].

Second, Brunswik insisted on the importance of studying stimuli representative of variations that actually occur in the organism's environment. He regarded mechanical factorial design as "anathema . . . since it is the antithesis of representative design" [22, p. 658] and often devoted so much attention to the representativeness of his stimuli that he completely neglected that of his experimental subjects [21, p. 524]. In short, Brunswik argued that artificially constructed test objects could only provide misleading results since "some of the intercombinations of variates may be incompatible in nature or otherwise grossly unrealistic" [19, p. 102] so that ecologically realistic stimuli should be used in their place "lest a distorted picture of psychological functioning be created." [19, p. 102] Thus, Brunswik strove toward the laboratory investigation of perceptual phenomena with functional characteristics similar to those that occur in the real world. Application of this principle has profound implications for the study of perceptual veridicality in applied aesthetics.

Difficulties in Consumer Aesthetics

Translated into terms applicable to the study of applied aesthetics in consumer research, Brunswik's two key teachings imply that one should study *not* the accuracy with which subjects *can* respond to experimentally-constructed artistic stimuli, but rather the veridicality of perceptual responses that subjects *do* attain when judging real art objects. In general, much consumer research has departed from the requirements implicit in this conclusion. First, many consumer researchers have dealt with artificially-constructed experimental stimuli likely to bear only superficial resemblance to real-world products [7-8, 10-11, 15-16, 23]. Second, these same applications have generally provided subjects with structured rating scales or response categories in terms of which to register their perceptions, thereby assessing how well they *can* detect stimulus differences rather than how well they *do* detect such distinctions without benefit of explicit hints from the researcher. This latter point is the crux of an important contrast between compositional and decompositional techniques and provides a key methodological basis for the present inquiry.

Compositional Versus Decompositional Methods

Compositional approaches to modeling perceptions collect subjective ratings on a number of specific attribute scales [compare 24] or bipolar adjectives [compare 25] and then submit these ratings to some multivariate technique such as multiple discriminant analysis [26, 27] or factor analysis [28, 29] to obtain a perceptual space for the rated objects on a reduced number of dimensions. Reasons for preferring the use of multiple discriminant analysis (MDA) in such applications of the compositional approach are discussed elsewhere [30-31]. This MDA procedure finds the uncorrelated linear combinations of subjective ratings (i.e., weighted sums) that maximize the ratio of among-objects to within-objects variance (and thereby do the best job of distinguishing among test objects). Illustrations in consumer aesthetics have dealt with jazz musicians [32-33], popular singers [34], and classical piano performances [16].

By contrast, *decompositional* approaches collect judgments on the similarity of all possible pairs of objects and then use multidimensional scaling (MDS) techniques [e.g., 35-38] to explain these pairwise similarity judgments by the distances between the objects' positions on a small set of underlying dimensions [for reviews, see 4, 39-42]. In general, MDS procedures begin with some trial solution for the objects' spatial positions, compute a measure of fit between interobject distances and input similarity scores, adjust the spatial positions in a manner that improves fit, recompute the measure of fit, and thus proceed iteratively so as to maximize the degree of correspondence between input similarity judgments and output spatial distances. Illustrations in consumer aesthetics have again dealt with jazz musicians [33] and popular singers [43].

Hypothesis

The general comparative merits of the compositional and decompositional approaches have been debated and tested by numerous researchers [25, 34, 44-51], with conclusions on the correspondence of compositional and decompositional solutions ranging from "slightly different" [51, p. 157] to "equivocal" [44, p. 351] to "almost perfect." [47, p. 89] The present study focuses, however, on their relative adequacy as frameworks within which to assess perceptual veridicality in aesthetics. Here, the crux of the matter concerns the fact that compositional approaches provide the subject with a structured set of clues and guideposts for organizing perceptual responses whereas decompositional methods avoid the introduction of such contaminating demand effects [34]. Accordingly, the latter approach may provide the most valid indication of attribute salience in aesthetic judgments:

One might say that multidimensional analyses of direct similarities (or dissimilarities) data reveal the dimensions most relevant to the subjects' perceptions or conceptions, whereas analyses based on [attribute ratings]

show what is implicitly most important to the experimenter [50, p. 63]. The reviewer feels that MDS is the preferable technique for determining the salient stimulus dimensions because it imposes the least restriction on the basis by which the judge makes his responses and most validly reflects the importance he attaches to them [52, p. 486].

Hence, when assessing perceptual veridicality, compositional approaches may divulge information concerning key stimulus dimensions so as to tap, at best, the performance that subjects *can* attain when aided and abetted by a set of conspicuous hints provided by the researcher. By contrast, the decompositional approach remains silent concerning the importance of attributes so that it may effectively probe the level of perceptual accuracy that subjects *do* achieve when left to their own cognitive devices in making aesthetic judgments.

Accordingly, it was hypothesized that compositional methods would credit subjects with a higher level of perceptual veridicality than that measured using a decompositional approach. In this sense, compositional techniques may be expected to "overstate" the level of perceptual performance attainable with less directive decompositional procedures, thereby reflecting the distinction between the levels at which subjects ideally *can* and typically *do* perform in aesthetic appreciation.

Illustrative Application to Perceived Differences in Jazz

This hypothesis was investigated in an illustrative application based on the perceptual mapping of jazz performances. Specifically, the authors assessed the perceptual veridicality of aesthetic responses to recordings of improvisations by fifteen saxophonists. Two methodological bases for selecting these jazz recordings should be stressed. First, relatively objective measures of the musicological characteristics of the performances were available—e.g., instrument, tempo, key, recording date, and style—thereby defining the meaning (and facilitating the assessment) of perceptual veridicality. Second, the recordings were samples of real music selected to vary systematically on objective characteristics while still remaining fairly representative of the range of jazz performances actually present in the musical environment. Both these points reflect an adherence, in spirit, to the principles articulated by Brunswik. Needless to say, however, the determination of what constituted key objective characteristics and a suitably representative range of styles reflected the informed judgment of the authors. When dealing with aesthetic objects, it could not be otherwise.

METHOD

Stimulus Objects

For manageability, attention was restricted to fifteen saxophone solos based on the major 12-bar blues form and accompanied by standard rhythm sections composed of bass, drums, and piano or guitar. In an effort to attain the

advantages of representative design, the fifteen recordings were selected so as to control some factors systematically but realistically while permitting others to vary in an uncontrolled but measurable manner.

Thus, artists were chosen to vary systematically in type of saxophone (alto versus tenor) and style (East Coast versus West Coast). The first characteristic (alto versus tenor) is simply a physical attribute of the instrument played while the second (East versus West) refers to such well-established musicological distinctions as the soloist's phrasing (rough versus smooth), structure (tight versus loose), rhythmic sense (on-the-beat versus laid-back), and harmonic tendencies (dissonant versus consonant)—criteria that enjoy almost universal acceptance among jazz critics and scholars as a key dimension of post-1950 saxophone styles [33]. It should be emphasized that, in accord with Brunswik's ideals, examples of both types of instruments playing both types of styles were easy to find and involved doing no violence to the realism of the experimental stimuli.

Uncontrolled but measurable characteristics, selected on the basis of their musicological importance and objective verifiability, included such features as key, tempo, and recording date. These, together with the other objective characteristics of the saxophone improvisations, are summarized in Table 1 [compare 33, 53].

For each saxophonist, three blues choruses (i.e., 36 bars of music)—with pauses at the beginning and end and with subjectively typical playing in between—were drawn from the improvised portion of the solo, thereby preventing identification of the artist from the name of the tune played. These unidentified excerpts were recorded on fifteen randomly numbered cassettes and played back, for each subject individually, on a Panasonic No. RQ-324S tape deck through Superex No. ST-PRO-B headphones.

Sample

Thirty-two subjects were recruited by signs posted on university bulletin boards and were rewarded for their participation by choosing a recording of one of the saxophonists studied. The form of this reward was intended to encourage the subjects' involvement in the listening task, and all participants did indeed show commitment in making their aesthetic judgments. Originally, an effort was made to partition subjects into four equal groups based on cross-classifications of 1) their knowledge of jazz from previous listening and 2) their ability to play a musical instrument. Extensive comparisons among these groups, however, showed no systematic differences in musical perceptions [53]. Accordingly, the groups were combined for purposes of the present analysis.

Task

Tapes were played for and evaluated by subjects individually in two sessions lasting about two hours each. To overcome problems of primacy or recency,

Table 1
Description of Fifteen Recordings by Jazz Saxophonists

<i>Style</i>	<i>Type of Saxophone</i>	<i>Performer</i>	<i>Key</i>	<i>Tempo</i>	<i>Approx. Date</i>	<i>Title of Tune</i>	<i>Record Label and Number</i>	
West	Tenor	Lester Young	D-flat		1952		Verve VE-2-2502	
		Stan Getz	B-flat		1957		Verve MG V-8321	
		Zoot Sims	G		1951		Prestige P-24061	
		Al Cohn	B-flat		1975		Famous Door HL-107	
	Alto	Paul Desmond	E-flat	210	1963	“St. Louis Blues”	Columbia C2S-826	
		Lee Konitz	B-flat	108	1956	“Cork ‘N’ Bib”	Atlantic 1258	
		Art Pepper	B-flat	200	1957	“Marty’s Blues”	Archives of Jazz AJ510	
	East	Tenor	Sonny Rollins	B-flat	154	1956	‘Bluesnote’	Blue Note BN-LA401-H2
			Dexter Gordon	B-flat	232	1974	‘Wee-Dot’	Steeplechase SCS-1025
			John Coltrane	F	196	1959	‘Some Other Blues’	Atlantic 1354
Hank Mobley			F	288	1961	‘Walkin’ ”	Columbia C2S-820	
Alto		Charlie Parker	F	218	1952	“Jam Blues”	Verve VE-2-2508	
		Sonny Stitt	F	259	1959	“Au Privave”	Verve MG VS-6108	
		Sonny Criss	F	262	1969	“California Screamin’	Prestige 7628	
		Phil Woods	E-flat	145	1956	“Stanley Stomper”	Prestige P-24065	

Source: Huber and Holbrook [33, 53]. This stimulus set, the rating task, and sample of subjects differ from those reported in previous studies [31-32].

fatigue, and order bias, pairs of tapes were exposed according to a cyclic design that balanced the orders and sequential positions of the recordings among subjects and between experimental sessions [54].

After listening to each pair of tapes, the subject provided a 6-position checkmark rating of the "degree of difference" between the two recordings from "small" (0) to "great" (5). Upon completing these dissimilarity judgments, the subject rated each recording on 6-point scales anchored by the following set of eighteen bipolar adjectives:

new - old	repetitive - shifting
changeable - stable	busy - lazy
feminine - masculine	light - heavy
complex - simple	composed - improvised
traditional - contemporary	dissonant - consonant
predictable - unpredictable	emotional - intellectual
slow - fast	warm - cool
random - structured	out-of-tune - in-tune
active - passive	poorly-recorded - well-recorded

Selection of these eighteen attributes was based on previous work with a similar set of stimuli [31, 32] showing these scales to be heavily loaded on factors remaining after removal of the evaluative component of the semantic differential [25]. This basis for choosing the scales was intended to insure that the resulting compositional space would be relatively perceptual rather than affective in nature.

Analysis

Multidimensional Scaling (MDS) — A decompositional MDS analysis of the pairwise dissimilarity judgments was performed using the INDSCAL routine [38, 55]. In accord with the earlier general description of multidimensional scaling, INDSCAL proceeds through a series of iterations so as to construct a spatial representation in which the relative positions of the objects do the best possible job of reproducing the original (dis)similarity judgments. Specifically, for any given number of dimensions, this procedure generates the spatial solution for which interobject proximities are maximally correlated with those implied by the input (dis)similarities data. One could represent the differences among fifteen saxophonists with fourteen dimensions. The point of MDS is to find out how many dimensions are really necessary or important.

Factor Analysis — Before undertaking the compositional analysis described below, the eighteen adjectival ratings were factor analyzed across musicians and subjects in order to derive a smaller number of more reliable perception indices.

This factor analysis generated the reduced set of uncorrelated principal components that best accounted for variance in the full set of eighteen ratings. Each successive factor is defined as the linear combination of ratings (i.e., weighted sum) with maximum variance, subject to the constraint of zero correlation with the other factors. The first five principal components (with eigenvalues greater than 1.0) accounted for 61.2 percent of the overall ratings variance. Adjectives correlated more strongly than .50 with a given factor were summed (with scale directions reversed where appropriate) to create the following indices [compare 56]:

activity = fast + active + busy

harmoniousness = in-tune + consonant + well-recorded + light

newness = contemporary + new

orderliness = stable + simple + structured + predictable + repetitive + composed

softness = intellectual + cool

In addition, the eighteenth adjective pair—feminine/masculine, which did not correlate strongly with any of the factors—was retained as a sixth “index” in the compositional MDA procedure.

Multiple Discriminant Analysis (MDA) — The six perceptual indices were then used as independent variables in a multiple discriminant analysis (MDA) to find the dimensions that best distinguish among saxophonists. These dimensions or discriminant functions are those linear combinations of perceptual indices (i.e., weighted sums) that maximize the ratio of among- to within-saxophonists variance, subject to a constraint of zero correlation among dimensions. Conceptually, the MDA solution results in maximal spatial distances among saxophonists combined with minimal disagreement across people on the position of each. The discriminant functions thus form the basis for a spatial representation of saxophonists in which the axes can be named both in accord with the weights of adjectival indices and in accord with the relative positions of characteristic vectors introduced into the space.

Characteristic Vectors — Interpretation of both the MDS and MDA spaces was facilitated by the introduction of vectors representing each of the objective saxophonist characteristics. Such characteristic vectors were positioned according to a procedure described by Carroll [57] in his explication of PREFMAP (Phase IV). Briefly, saxophonists’ characteristics were regressed on their spatial coordinates with the resulting regression coefficients providing the direction cosines of the corresponding vectors and with the appropriate squared multiple correlations (R^2) indicating their degrees of fit. The point is to find out what the MDS or MDA dimensions mean. In these regressions, key was coded as the number of flats (positive) or sharps (negative) away from C-major; East-West

and alto-tenor as zero-one dummy variables; and tempo (beats per minute) and recording date in their original numerical form as shown in Table 1.

Measure of Perceptual Veridicality – The perceptual veridicalities of the MDS and MDA spaces in representing the aforementioned objective characteristics were assessed by canonical correlation analysis. Canonical correlation is a statistical method for determining how two sets of variables (e.g., position in MDS space and objective characteristics) are related. This use of canonical correlation provides a multidimensional analogue of Brunswik's Lens Model [58; 59, p. 124]. As applied here, the analysis sequentially finds the canonical variates (i.e., linear combinations or weighted sums), based on 1) saxophonist coordinates and 2) objective characteristics, that are maximally correlated subject to a constraint of statistical independence among successive canonical variates. The magnitudes of these correlations (r) between successive pairs of linear combinations indicate the degree to which variance in spatial positions of the saxophonists is explained by their objective characteristics. Accordingly, the mean squared canonical correlation (mean canonical r^2) was taken as an index of perceptual veridicality as embodied, respectively, by the decompositional MDS and compositional MDA solutions.

To measure the correspondence between a perceptual space and objective characteristics, mean canonical r^2 [60; 61, p. 320] has been applied in the context of consumer behavior [16, 31], but is less satisfactory than the "redundancy" index developed by Stewart and Love [62-64]. However, when the "dependent" variables are uncorrelated (as in MDA generally) or minimally related (as in the present MDS solution), redundancy and mean canonical r^2 turn out to be equivalent or practically identical indices of shared variance [16]. The present study therefore used the mean canonical r^2 measure of perceptual veridicality. (Note, however, that it is necessary to employ the redundancy index when assessing the veridicality of perceptual maps with correlated dimensions [65].)

In accord with the Brunswikian tradition, the measure of veridicality just described is correlational in nature. Another approach, particularly suitable to the case of categorical judgments, uses measures of information transmission [66-68]. Recently, Glazer [23] has advocated the application of this information-theoretic measure to the study of (mis)perception in consumer behavior.

RESULTS

Decompositional MDS Space

The two-dimensional INDSCAL solution is shown in Figure 1. The fit of this perceptual space—as indicated by the correlation between input and output proximities—was $r = .53$. Since this degree of fit was improved only to $r = .58$

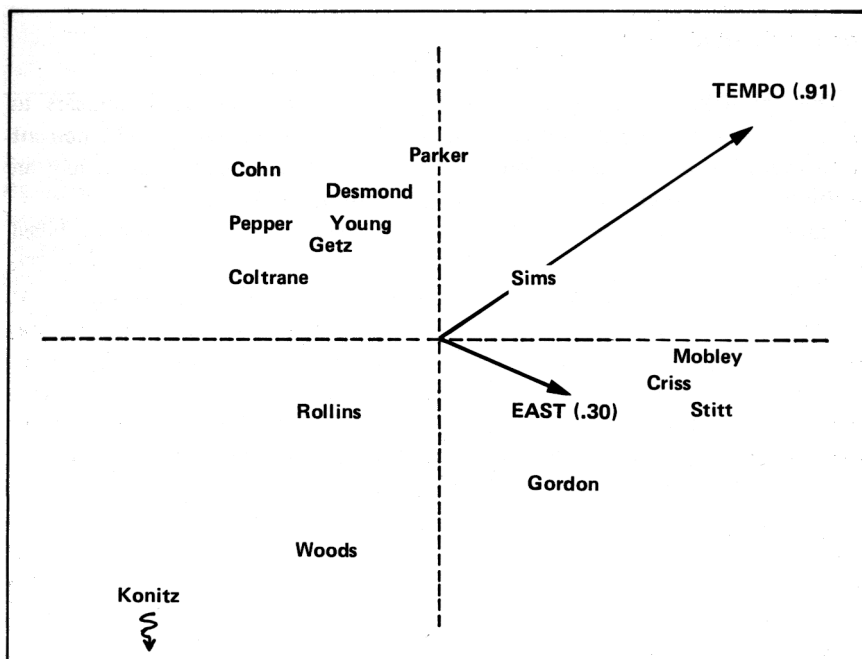


Figure 1 Decompositional MDS Space for Fifteen Jazz Saxophonists and Characteristic Vectors (with Fits Better than $R^2 = .25$)

by the addition of a third dimension, the two-dimensional solution was retained for further analysis. Its relatively weak fit, however, does presage some problems in perceptual veridicality uncovered by a later phase of the investigation.

Interpretation of the MDS space was aided by vectors introduced to represent objective characteristics of the saxophonists. Figure 1 contains those characteristic vectors with fits better than $R^2 = .25$ (shown parenthetically). Vector lengths are proportional to their fits. The TEMPO vector, $R^2 = .91$, $p < .001$, distinguishes between the performances by Mobley (288 beats per minute), Criss (262 bpm), and Stitt (259 bpm) and the slower paces set by Konitz (108 bpm), Woods (145 bpm), and Rollins (154 bpm). The EAST vector, $R^2 = .30$, $p > .10$, does a somewhat less perfect job of indicating the contrast between styles typical of the East (Stitt, Mobley, Criss, Gordon) and West (Cohn, Pepper, Desmond, Young, Getz). On this latter vector, Coltrane and Parker are seriously misplaced. Their positions among the West-Coast saxophonists cannot be defended on musicological grounds but must have resulted from some perceptual criterion employed by the subjects but not accessible to the experimenters' intuition. Indeed, such interpretive problems are one reason why decompositional MDS approaches can sometimes prove frustrating to the investigator.

Compositional MDA Space

The two-dimensional space generated by the MDA solution appears in Figure 2. Here, the first two discriminant functions accounted for 92.7 percent of the variance in the six attribute indices while a third contributed only an additional 3.8 percent and was therefore not considered further.

Again, characteristic vectors (with fits better than $R^2 = .25$) were introduced to facilitate interpretation of the MDA space. The TEMPO vector, $R^2 = .92$, $p < .001$, provides another clean distinction between faster performances at one end (Stitt, Criss, Mobley, Sims) and slower paces at the other (Konitz, Woods, Rollins). Here, however, the EAST vector, $R^2 = .53$, $p < .02$, better delineates the difference between East (Gordon, Rollins, Coltrane, Mobley) versus West (Young, Desmond, Getz, Pepper, Parker, Cohn, Sims). Though Parker is still slightly misplaced among the West-Coasters, his position is less errant than before.

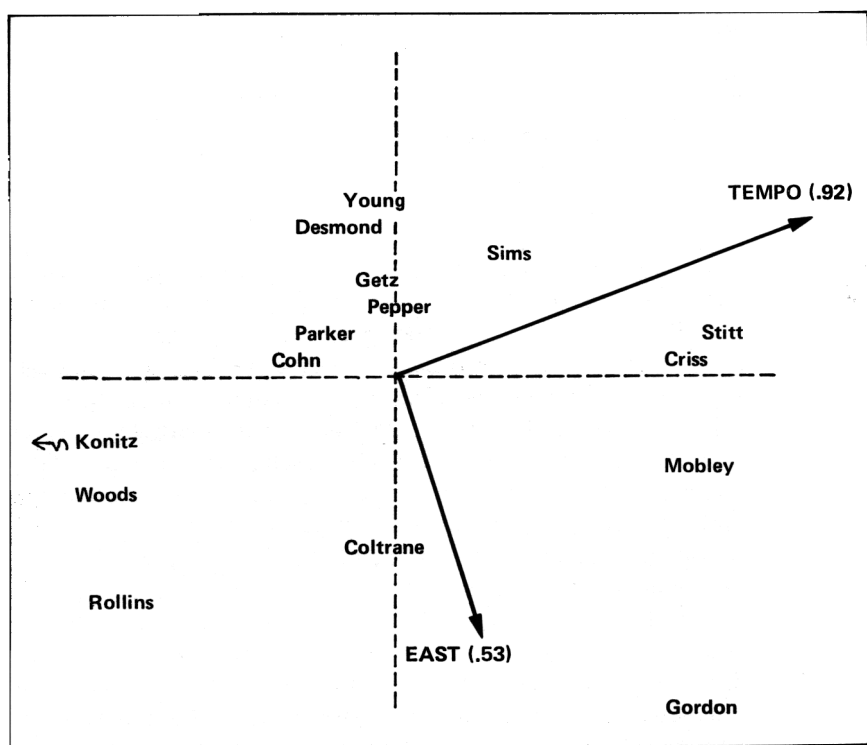


Figure 2. Compositional MDA Space for Fifteen Jazz Saxophonists and Characteristic Vectors (with Fits Better than $R^2 = .25$)

Table 2
Standardized Discriminant Function Coefficients

	<i>Function 1</i>	<i>Function 2</i>
Activity		.50
Harmoniousness		.69
Newness		-.28
Orderliness		.48
Softness		.14
Masculinity		-.10

This interpretation of the MDA space is reinforced by the pattern of standardized discriminant function weights shown in Table 2. Not surprisingly, activity (fast + active + busy) completely dominates the first discriminant function which is, in turn, closely associated with the TEMPO vector. Meanwhile, the second discriminant function has more evenly distributed positive weights for harmoniousness (.69) and orderliness (.48)—both characteristics associated with the West-Coast School. Thus, the discriminant coefficients cohere with the implications of the characteristic vectors in the compositional MDA space and suggest that, when compared with the MDS map, the discriminant solution may be the more valid representation of objective features such as tempo and style.

Perceptual Veridicality

This impression is strengthened when canonical correlation analysis is used to assess perceptual veridicality in the MDS and MDA spaces. For the MDS space, the squared correlations of the two canonical variate pairs were, respectively, .96 and .26. Mean canonical r^2 , taken here as an overall measure of perceptual veridicality, was therefore .61. By contrast, the squared canonical correlations for the MDA solution were .96 and .81—for a mean canonical r^2 of .89. Clearly, then the MDA space produced a higher index of perceptual veridicality than that attained by the MDS solution: .89 versus .61.

DISCUSSION

The present study supports the hypothesis that—presumably for the reasons advanced above—compositional methods such as MDA are likely to register greater apparent perceptual veridicality in aesthetic judgments than that measured by decompositional approaches such as MDS. It appears that this

disparity results from the fact that compositional procedures provide hints to subjects concerning salient aesthetic attributes whereas decompositional techniques provide no such clues.

One must, of course, remain sensitive to possible limitations due to the nature of the sample and the stimuli tested. To its credit, however, the present study did use subjects expressing an interest and involvement in the artistic products investigated. More importantly, to a greater extent than previous studies of perceptual veridicality in consumer aesthetics, it attempted to select realistic examples from the full range of stimuli typical of the relevant class of artworks.

A potentially more serious limitation concerns the internal validity of the difference in perceptual veridicality between the MDS and MDA spaces. Since the latter was derived from ratings made on the basis of greater familiarity with the stimuli, it might be argued that direct comparisons are not completely "fair." The authors would reply that, from this perspective, it is difficult to design a more "fair" comparison. Certainly, it would not be reasonable to insist on comparing an MDA space derived from ratings based on *no* stimulus familiarity with an MDS representation of a complete set of pairwise similarity judgments—as would occur, for example, in an experimental design where one group gave only MDA attribute ratings and the other only MDS similarity judgments. Perhaps a more appropriate standard would be to compare identical groups of subjects who have the same levels of familiarity with the stimuli at the *end* of the experiment. Except for the one extra exposure required by the adjectival ratings—which probably had little overall impact on stimulus familiarity—the present study came remarkably close to fulfilling these ideal conditions in that the same group of subjects possessed roughly the same levels of stimulus familiarity when completing their MDS judgments and MDA ratings so that each subject tended to serve as his own control. Moreover, if familiarity had played a role in the better fit attained by the MDA space, it should follow that the subjects with more exposure to jazz and/or the ability to play a musical instrument would have scored higher in perceptual veridicality when complete analyses were performed separately for the four subgroups defined above. As mentioned earlier, however, such systematic differences between the four groups of subjects failed to appear—thereby discrediting the familiarity hypothesis as an alternative explanation for the better fit of the MDA space. Finally, on a different sample of subjects drawn from essentially the same student population, the authors [31-32] derived an MDA space based on first-exposure adjectival ratings of a stimulus set identical to that used here except for the absence of Hank Mobley. Based on the first two pairs of canonical variates, mean canonical r^2 between the MDA space and objective characteristics was .87, virtually the same as the perceptual veridicality of .89 obtained in the present study. Since it was based on only one exposure to each recording, this finding again argues that the higher perceptual veridicality of the MDA space cannot be explained by greater stimulus familiarity.

CONCLUSION

In sum, the present study suggests important differences between compositional and decompositional methods for assessing perceptual veridicality in applied aesthetics. When deriving perceptual spaces and determining their correspondence to objective artistic features, compositional techniques such as MDA appear useful for indicating the degree of perceptual veridicality that subjects *can* attain if they are aided by clues provided by the experimenter in the form of structured rating scales. Such estimates probably overstate the degree of veridicality typically attained in aesthetic perception. Here, decompositional methods like MDS appear to tap the less impressive degree of perceptual veridicality that subjects *do* achieve if they are confronted with a nondirective similarity-judging task. In short, the choice between compositional and decompositional methods hinges on whether the researcher wishes to measure cognitive capabilities or perceptual performance in aesthetic appreciation.

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