

# The meanings of the physiognomic stimuli *taketa* and *maluma*

MARTIN S. LINDAUER

State University of New York, College at Brockport, Brockport, New York

Physiognomic properties refer to the nonliteral sensory, perceptual, and affective connotations evoked by an object: a mountain, for example, is big as well as "quiet, looming, and threatening." In this study ( $N = 58$ ), the three types of meanings carried by meaningless stimuli were examined. Four equally unfamiliar stimuli, which were either physiognomically evocative (*maluma* and *taketa*) or neutral, were rated on 15 perceptual, affective, and sensory scales. *Taketa* and *maluma* were distinguished on 21 of the 30 endpoints of the scales, whereas the neutral stimuli were distinguished on only 8. Subjects' physiognomy and sex did not play a role. The implications of these findings are discussed.

Persons as well as the physical environment can be described in expressive terms. A face or a mountain, for example, can be "quiet, dark, and peaceful," suggesting sensory-perceptual and affective properties, respectively. These evocative meanings are labeled *physiognomic* (Arnheim, 1972; Gibson, 1979; Gombrich, 1972; Kohler, 1938/1947; Lindauer, 1984a; Pratt, 1969; Schlesinger, 1980; Werner, 1956; Werner & Wapner, 1952; Winner, 1982).

Physiognomy also applies to unfamiliar and even nonsense stimuli (Kohler, 1938/1947; Pratt, 1969). A round shape can be called "peaceful" (see Figure 1-1) whereas an angular one is "aggressive" (Figure 1-2). Furthermore, the sight of these shapes "sounds" as if they should be assigned the nonsense names *maluma* and *taketa*, respectively (i.e., synesthesia; see Marks, 1978). The evocative connotations of the *taketa* and *maluma* shapes affect their color, size, and distance perception (Lindauer, 1986, 1988). Thus, the *taketa* shape was matched with stimuli that were bigger and farther away, as well as more saturated and brighter in color than *maluma* and two neutral shapes (a random-dot pattern and an amoeba-like form, Figures 1-3 and 1-4, respectively).

The sensory-perceptual and affective aspects of physiognomy, however, are typically not distinguished from one another (Homburg, 1986; Stein, 1975). The three are usually treated as if they were equivalent, perhaps because they can be initiated by the same object (as in the face and mountain example above). But it is also possible that one kind of meaning (sensory? perceptual? affective?), or two, makes the major contribution to physiognomy.

The purpose of this study, therefore, was to determine the distinction, if any, between the sensory-perceptual and affective meanings of physiognomy. If there are differences, this would suggest the relative importance of one or another process to physiognomy. To this end, the meanings of two stimuli known to be physiognomic, *taketa* and *maluma* (Kohler, 1938/1947), along with two neutral stimuli, were rated and compared on 15 sensory-perceptual and affective scales.

The following predictions were made:

1. The sensory-perceptual and affective ratings assigned to the physiognomic *taketa* and *maluma* should not be distinguished from one another, if in fact these three meanings make equal contributions to physiognomy.

2. The sensory-perceptual and affective meanings of the two physiognomic stimuli should differ from those for the two neutral stimuli, the random dots and amoeba-like shape. The former stimuli should receive more extreme ratings on the scales of meaning, because they carry more powerful and richer connotations than do the neutral stimuli.

3. The meanings of the two physiognomic stimuli should sharply differ from each other: Their ratings should fall at opposite ends of the various scales of meaning (e.g., *taketa* as aggressive and *maluma* as peaceful).

4. The previously demonstrated effects of *maluma* and *taketa* on color, size, and distance perception (Lindauer, 1986, 1988) should be replicated on a rating task (e.g., *taketa*'s would be rated as "bright," "rich," "big," and "distant.")

5. Subjects who are physiognomic—that is, subjects who score high on a physiognomy test (Stein, 1975) compared with those who score low—should assign more extreme meanings to all stimuli. Individual differences in physiognomy have not previously been examined in a task using physiognomic stimuli. Sex differences were also examined, although previous research has not shown this to be a factor in physiognomy (Bilotta, Guare, & Lindauer, 1981).

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A brief version of this study, entitled "The Perceptual, Affective, and Synesthetic Meanings of Physiognomic Stimuli," was presented at the annual meeting of the Eastern Psychological Association, Buffalo, NY, 1988. Correspondence may be addressed to Martin S. Lindauer, now at the Institute of Gerontology, The University of Michigan, 300 North Ingalls, Ann Arbor, MI 48109-2007.

## METHOD

Two evocative and two neutral stimuli, previously used in earlier studies (Lindauer, 1984b, 1986, 1988), were again relied upon. There is general agreement that maluma and taketa (Figures 1-1 and 1-2) are prototypical examples of physiognomy; they are frequently referred to in discussions and relied upon in research (e.g., Kohler, 1938/1947; Lyman, 1979; Pratt, 1969). These two stimuli were shown with two more or less randomly constructed and hence ostensibly more neutral stimuli (the dot figure and shape; Figures 1-3 and 1-4, respectively); these have also been used previously (Lindauer, 1986, 1988). The reactions to their colors, sizes, and distances were known to differ, and they were equally unfamiliar.

The four stimuli were rated on 15 scales anchored by opposite adjectives (e.g., bright-dark). Adjectives with sensory-perceptual and affective connotations were selected from several sources, including previous research (e.g., taketa had been matched with bigger stimuli, hence the pair *big-little* was chosen; Lindauer, 1986); affective descriptors were chosen from the semantic differential (Osgood, May, & Miron, 1975), and a thesaurus was the basis for selecting a relatively broad spectrum of words with more sensory than perceptual connotations (i.e., visual as well as nonvisual). An original list of over 50 words was reduced to 15 in order to have an equal number of words in each category of meaning. Admittedly, the assignment of some of the scales to one or the other category of meaning is ambiguous. For example, *thick-thin* could be sensory or affective, as well as perceptual; *cold-hot* could also connote affect. Thus, the labels for the categories are somewhat arbitrary. In order to separate sensory from perceptual meanings, multiple examples of each class of meanings were used, emphasizing one category more than the other. These larger sensory, perceptual, and affective categories were also analyzed.

The perceptual scales included the following: bright-dark, rich-pale, far-near, big-small, and thick-thin; all but the last scale pertained to previous findings (Lindauer, 1986, 1988). The affective dimension included these scales: peaceful-aggressive, relaxed-tense, strong-weak, friendly-unfriendly, and tender-tough. The scales intended to be more sensory than perceptual were as follows: quiet-noisy, slow-fast, light-heavy, blunt-sharp, and cold-hot. These sensory words were less familiar (at least in print; Thorndike & Lorge, 1944) than the words in the other two sets [ $\chi^2(1; N = 20) = 8.57, p < .01$ ]; but the frequency of the sensory and affective words did not differ [ $\chi^2(1; N = 20) = 3.51, p > .05$ ]. As the results will later show, however, this difference in the familiarity of the sensory words was not a factor.

All four stimuli were rated on 15 scales by 58 subjects (16 men and 42 women). They were volunteers from several undergraduate psychology classes; about half, from introductory classes, received credit. The subjects had previously been given the Physiognomic Cue Test (Stein,

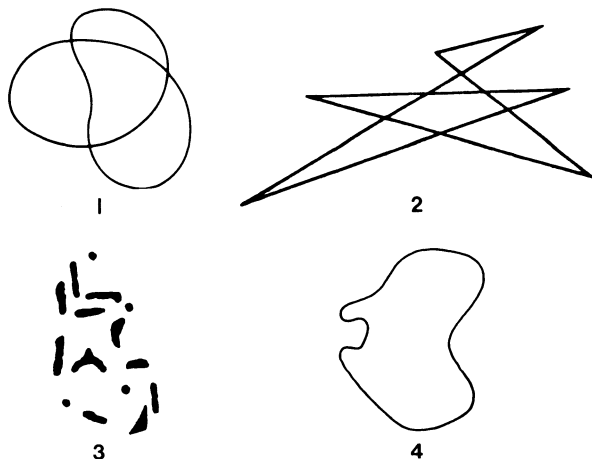


Figure 1. The four stimuli used: physiognomic (maluma and taketa, Nos. 1 and 2, respectively) and neutral (dot pattern and amoeba-like shape, Nos. 3 and 4, respectively).

Table 1  
The Meanings of Physiognomic Stimuli: Mean Ratings

Scale	Stimulus							
	Taketa		Maluma		Amoeba		Dots	
	M	Rank	M	Rank	M	Rank	M	Rank
<b>Perceptual</b>								
Bright-Dark	2.89	1	3.38	2	3.90	3	5.18	4
Rich-Pale	3.78	1	4.80	3	4.88	4	4.07	2
Far-Near	4.50	2	5.38	4	4.95	3	4.09	1
Big-Small	2.52	1	3.20	3	2.92	2	4.09	4
Thick-Thin	4.50	4	3.40	2	3.11	1	3.90	3
<b>Affective</b>								
Peaceful-Aggressive	6.12	4	2.73	1	3.18	2	4.04	3
Relaxed-Tense	6.23	4	2.57	1	3.09	2	4.19	3
Strong-Weak	1.81	1	3.83	2	4.88	4	4.23	3
Friendly-Unfriendly	5.19	4	2.78	1	3.65	2	4.61	3
Tender-Tough	5.88	4	2.87	1	3.37	2	4.44	3
<b>Sensory</b>								
Quiet-Noisy	5.71	4	2.80	1	3.14	2	3.83	3
Slow-Fast	6.37	4	3.21	2	2.38	1	3.38	3
Light-Heavy	4.64	4	3.40	1	4.35	3	4.19	2
Blunt-Sharp	5.79	4	2.21	2	2.19	1	3.30	3
Cold-Hot	3.97	4	3.76	3	3.73	2	3.21	1

Note—Adjectives on the left side of each pair were rated "1"; adjectives on the right were rated "7."

1975). On the basis of scoring either above or below the median of the total score (= 97), the subjects were categorized as having either high ( $N = 28$ ) or low ( $N = 30$ ) physiognomy, respectively. (The average score was typical of the published norms for undergraduates; see Stein, 1975.)

Each of the four stimuli, along with the 15 scales of meaning, was placed on a separate page in a booklet. The orders of the stimuli and scales were systematically varied; the poles of the scales were alternated; four orders of the scales were used; and the pages, each with one of the four stimuli at the top, were shuffled. Thus, the sequence of stimuli and scales was random. The task was preceded by a preliminary trial with a sample stimulus and several bipolar scales (none of which was used in the study). The task was self-paced, and lasted about 30 min. The subjects were told to rate each stimulus on each scale and not to skip any.

The two opposing adjectives of each scale were tied by seven boxed spaces that represented the degree to which one side of the scale best described the stimulus. The subjects were told to mark the "part of the continuum that corresponds to your judgment of that shape." Their marks were converted to a 7-point scale. (In Table 1, the left-hand term of the bipolar scale represents the value "1"; the right-hand term = "7.") The study was explained at the outset as an investigation of "the rated meanings of four unfamiliar objects." It was conducted in small group sessions of about 4-6 subjects each. Prior to the experimental session, the subjects were given a test of physiognomy.

The ratings for each of the four physiognomic and nonphysiognomic stimuli were compared on each of the 15 scales. In addition, the ratings for the four stimuli, on each of the 15 affective, perceptual, and sensory scales, were combined in order to examine their overall meanings. Individual differences in tested physiognomy and sex were also included in these analyses.

## RESULTS

## General Findings

The four stimuli significantly differed ( $p < .05$ ) from one another on 14 of the 15 scales of meaning (Table 1). These included the sensory [ $F(3,162) = 4.74-90.09, p < .05$ ], perceptual [ $F(3,162) = 4.42-19.99, p < .01$ ], and affective [ $F(3,162) = 22.29-39.68, p < .01$ ] sets

of scales. Only the hot-cold sensory scale failed to differentiate the four stimuli [ $F(3,162) = 2.48, p < .10$ ]. In the analyses that follow,  $F$  tests for simple effects ( $p < .05$ ) were based on Neuman-Keuls analyses.

### Taketa versus the Other Stimuli

The physiognomic stimulus taketa fell at 14 of the 15 endpoints of the scales; its ratings significantly differed ( $p < .05$ ), either higher or lower than at least one and as many as three of those for the other stimuli. Compared to the other stimuli, taketa was the brightest, richest in color, biggest, and thinnest (perceptually); most aggressive, most tense, strongest, unfriendliest, and toughest (affectively); and noisiest, fastest, heaviest, and sharpest (sensorily). The only exception was the near-far perceptual scale, on which taketa's ratings were at an intermediate level (the dot pattern connoted the greatest distance and maluma the least). However, taketa was rated as significantly ( $p < .05$ ) more distant than maluma ( $M = 4.50$  and  $5.38$ , respectively). And on the hot-cold scale, where the differences between the stimuli were not significant, taketa was still rated as the hottest of all the stimuli. Thus, as in the earlier perceptual studies (Lindauer, 1984b, 1986, 1988), taketa was distinguished by its brightness, richness of color, and large size; and compared to maluma, it also suggested a greater distance. Judgments of taketa's rated meanings therefore paralleled the matching data. And as predicted, taketa was more distinguished than any of the other stimuli. Further analyses of its characteristics follow.

The mean ratings of taketa across each set of scales indicated that some of its attributes were more important than others. On the sensory scales [ $F(4,228) = 26.56, p < .01$ ], taketa was distinguished (i.e.,  $p < .05$ ) by its coldness and heaviness ( $M = 3.97$  and  $4.64$ , respectively), as well as by its noise, sharpness, and speed ( $M = 5.71, 5.79$ , and  $6.37$ , respectively). Within the perception scales [ $F(4,228) = 12.45, p < .01$ ], taketa stood out because of its bigness ( $M = 2.52$ ), nearness, and thinness ( $M = 4.50$  each). In contrast, its brightness-darkness and richness-paleness ratings fell at relatively intermediate levels ( $M = 2.89$  and  $3.38$ , respectively). Among the affective scales [ $F(4,228) = 183.32, p < .01$ ], taketa was distinguished by being strong ( $M = 1.81$ ), as well as unfriendly, tough, aggressive, and tense ( $M = 5.19, 5.88, 6.12$ , and  $6.23$ , respectively).

In general, taketa's sensory connotations were intense, heightened, and exaggerated (i.e., it was rated as cold, heavy, noisy, sharp, and fast). Its perceptual meanings were distinguished more by its size and spatiality (distance and thickness) than by its color (brightness and richness-saturation). In affective terms, taketa was generally described as rather assertive in a somewhat negative way (as strong, unfriendly, tough, aggressive, and tense).

### Maluma and the Physiognomic Stimuli in General

The physiognomic stimulus maluma was also distinguished: it fell at seven extreme points of the scales. Com-

pared to the other stimuli, it was judged to be nearest (perceptually), most peaceful, most relaxed, most tender, and friendliest (affectively); and quieter and blunter (sensorily).

The two physiognomic stimuli therefore accounted for 75% of the extreme scores (i.e., they received a rank of 1 or 4 on 21 of the 28 possible scales; see Table 1). They also anchored the opposite poles of six scales: peaceful-aggressive, relaxed-tense, friendly-unfriendly, and tender-tough (the perceptual scales); and quiet-noisy and blunt-sharp (the sensory scales).

### The Neutral Stimuli

The responses to the two neutral stimuli, compared with those to the physiognomic stimuli, were considerably more muted. Their mean ratings occupied only 8 extreme points, versus 21 for the physiognomic stimuli—a difference that was significant [ $\chi^2(1; N = 28) = 5.14, p < .05$ ]. The amorphous shape (Figure 1-4) received an extreme rating in five instances; compared with one to three of the other stimuli, it was the palest, biggest, thickest, weakest, slowest, and heaviest. The dot pattern (Figure 1-3) received the maximum rating on only three scales: It was the darkest of the stimuli, as well as the smallest and farthest. The two neutral shapes did not anchor the opposite ends of any scale (compared to six for the physiognomic stimuli).

### The General Categories of Meaning

The overall sensory, perceptual, and affective meanings of the four stimuli were compared by combining their means on each on the five scales within the three categories [the three categories differed;  $F(2,108) = 95.05, p < .01$ ]. The results paralleled the individual scales. Taketa received the most extreme overall score on each category. It was characterized by heightened sensory qualities ( $M = 5.39$ ; e.g., noisy and fast), exaggerated perceptual attributes ( $M = 3.67$ ; e.g., bright and richly colored); and strong affect ( $M = 5.05$ ; e.g., aggressive and tough). Maluma stood out on the affective and the sensory categories ( $M = 2.96$  and  $3.08$ , respectively): It carried positive affective qualities (e.g., peaceful and relaxed) and subdued sensory referents (e.g., quiet and slow). And one neutral stimulus was distinguished on only one category. The dot shape was distinguished on the perceptual category by its unobtrusive connotations ( $M = 4.27$ ; e.g., thin and small).

Thus, the differences between the physiognomic and neutral stimuli on the 15 specific scales were reflected in the three general categories of meaning. The similar profiles of the four stimuli on the sensory and other categories (and scales), furthermore, indicate that the relative unfamiliarity of sensory words, compared to the other two sets of adjectives, noted in the Method section, did not affect the distinction between the physiognomic and neutral stimuli.

### Individual Differences

Sex and subjects' degree of physiognomy played minor roles. A sex difference was found on only one scale: Com-

pared to the men's ratings, women's scores were "tougher" (on the tender-tough scale) across the four stimuli [ $F(1,54) = 4.66, p < .05$ ]. Interactions between sex and the stimuli's ratings, however, were nonexistent ( $F < 1$ ). There was a sex difference across the three categories of meaning: Men gave generally lower scores than women did [ $M = 4.46$  and  $4.79$ , respectively;  $F(1,54) = 5.56, p < .05$ ]. However, since these scores represent a combination of all scales and categories, their meaning is unclear.

The subjects' physiognomy was a factor in only a few instances. High physiognomic subjects gave "stronger" and "tougher" ratings (across the four stimuli) than low scorers did [ $F(1,54) = 8.39$  and  $5.11$ , respectively,  $p < .05$ ]. Level of physiognomy affected specific stimuli in only two instances: on the thick-thin scale [ $F(3,162) = 5.13, p < .01$ ] and on the strong-weak scale [ $F(3,162) = 6.52, p < .05$ ]. In these two cases, however, the main pattern of results persisted: While taketa was thinner among low physiognomic scorers than among high scorers, it was still thinner than the other stimuli in both groups. And among the strong-weak scores, the interaction affected the amoeba-like shape only; taketa's outstandingly strong scores were unaffected among both types of physiognomic subjects.

The total physiognomic score, used in the above analyses, includes two other components (Stein, 1975): Factor A, which emphasizes the affective response to a stimulus (e.g., "lines-as-anger"), and Factor B, which focuses on the thing-like response to a stimulus (e.g., "lines-as-rain"). The assignment of subjects to high or low categories on the basis of their total scores, however, was nearly the same as their assignment to the two other factors. For example, on Factor A, only 4 subjects shifted from either a high total score to a low Factor A score or vice versa (a change of less than 7%). Thus, further analysis on the basis of these factors was not considered necessary.

## DISCUSSION

The physiognomically endowed taketa and maluma were distinguished from the neutral stimuli and from one another on the perceptual, affective, and sensory scales (and the larger categories to which they belonged). Furthermore, the ratings of the physiognomic stimuli on the perceptual scales replicated previous matching studies (Lindauer, 1986, 1988). Thus, all but one of the predictions were confirmed. The exception was that individual differences in physiognomic sensitivity did not affect the ratings. One explanation might be that the subjects were not sufficiently different in their physiognomic sensitivity. Their high and low scores were defined in relation to the median, rather than by the top and bottom ranges of published norms. (Not enough subjects fell at these extremes.) Sex, as expected, was not a factor (Bilotta, et al., 1981).

Expressive properties were therefore more likely to be found among the two physiognomic than neutral stimuli; the former stood out on 20 scales, versus 8 scales for the latter. And taketa was more evocative than maluma (on 13 vs. 7 scales, respectively). But note that the two neutral shapes were also somewhat evocative; the neutral shape and the dot pattern were distinguished on 5 and 3 scales, respectively. Thus, even with nonsense materials, it is difficult to minimize or control for physiognomy. While expressive qualities are therefore inherent in any stimulus, the degree to which they are does vary.

This study serves as a starting point for identifying physiognomic stimuli. The 14 dimensions on which taketa was distinctive could be used as a checklist with which to select other stimuli. Whether angular taketa-like figures in general are more expressive than curvy maluma-like shapes, and whether both are more evocative than closed-contoured or broken-pattern stimuli, can therefore be determined. But until more stimuli (and scales; e.g., rough-smooth) are sampled, the results for four stimuli (on 15 scales) must be generalized cautiously.

Yet on the basis of the present data at least, in which the two physiognomically endowed stimuli stood out on about the same number of scales across the three categories of meaning, it appears that the sensory, perceptual, and affective connotations of physiognomy are equivalent.

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