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Original Contributions - Originalbeiträge

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To Communicate Without Signs Through Expressive Qualities

1. Introduction

The aim of the present paper is to introduce the theoretical conceptualization of perceptual communication through expressive qualities. The study of expressive qualities has a long tradition of theoretical research in Experimental Phenomenology (Stumpf, 1907; Wertheimer, 1923; Katz, 1935; Metzger, 1941; Michotte, 1946; Kanizsa, 1979; Thinès, Costall, & Butterworth, 1981; Bozzi, 1989; 1999; Savardi and Bianchi, 1997; Masin, 2002; Sinico, 2003; 2008; Verstegen, 2005; Zavagno, Antonelli, & Actis Grosso, 2008; Toccafondi, 2012; Albertazzi, 2013, Calì, 2017), with a huge amount of experimental research. According to Experimental Phenomenology, expressive qualities (e.g., "the willow is weeping", "the sea is agitated", and "the front of the car is aggressive") are not simple subjective projections. This concept – whereby inanimate objects are perceived to have emotions or moralities as humans do – is a subclass of tertiary qualities. According to Bozzi (1985):

> If black is gloomy, red is lively. The shadow of a great green tree is soothing and relaxing. A diminished-seventh chord is sharp and anxious. A slow and rising gesture is hieratic. Here we aren't limiting ourselves to arbitrarily bestowing stereotyped adjectives to mere facts; in those facts there are truly characteristics that magnetically attract those adjectives, and those characteristics are not of a verbal or associative nature, but perceptual ingredients present within the facts themselves. (English translation in Bozzi, 2019, p. 356)

Differently from the traditional distinction between qualities of experience introduced by John Locke, Experimental Phenomenology – and in particular, Gestalt Psychology – defines tertiary qualities as the immediate qualities of experience before any kind of categorization (Sinico, 2012). In contrast to the primary and secondary qualities, tertiary qualities do not fall within the category of the mensurative schema. Tertiary qualities are typically exemplified by melody, which, when transposed in key so that each of the tones has a different frequency, does not change. However, tertiary qualities do not express anything. In fact, a simple sequence of three tones (C, E flat, and G) has both an expressive character of sadness and a tertiary character of unitary succession as its specific phenomenal quality (Sinico, 2015).

Insofar as qualities phenomenally perceived and intersubjectively verifiable, they are objective. When Wolfgang Köhler writes that "Few people can hear the rumbling crescendo of distant thunder as a neutral sensory fact; it sounds to most of us 'menacing' (1947 [1929], p. 244)", he maintains that people hear this intersubjective expressive quality, a menace, belonging to objects of the external phenomenal world. In this theoretical perspective, expressive qualities are *a parte objecti*: "I do not see any reason why such 'tertiary qualities' should not occur on the objective side of the phenomenal field" (Köhler, 1938, p. 78).

The present paper deals with how an object communicates meaning through expressivity without signs. For this reason, initially, the difference between semiotic and perceptual modes of communication is discussed. After defining expression, I present some experimental phenomenological studies as examples of perceptual communication through expressive qualities. Lastly, expressive plurivocity is discussed.

2. Perceptual Communication Mediated by Sign and Based on Expressive Qualities

Perceptual communication has principally two different modalities. The first one is mediated by signs, and the second one is based on expressive qualities. This distinction reflects two different conceptions in perception: the theory of indirect perception, supported in particular today by cognitive scientists, as opposed to the second conception, the theory of immediate perception, supported by Gestaltists, Michottians, and also ecological psychologists (see Schwartz, 2004).

In fact, perceptual communication mediated by signs implies mental representation. This is the classic assumption of Cognitive Science, which is coherent with the theoretical basis of Semiotics (Eco, 1968). For example, on a street sign, the icon of a deer, is needed to communicate to the driver the danger that a deer may cross the road. The icon of the deer is connected to its reference, which is the representation of the deer in the mind of the driver. By activating this representation, the driver understands the risk that a deer, in flesh and bone, may suddenly appear in front of him. Using a rhetorical figure, he understands the risk of colliding against the reference. This modality of communication is largely accepted and assimilated in the semiotics culture. Each time that a community shares the meaning of a sign (a symbol, an index, or an icon), the question of the relationship between sign and reference is an important cognitive question. In this sense, the semiotic thinking is very precious, and it is well represented in literature.

Conversely, the second modality of perceptual communication, based on expressive qualities, does not have an acceptable bibliography. There are some

historical reasons for this, which I identify principally in the assumption of physicalism in Cognitive Science (Sinico, 2015). In any case, the generic and passive acceptation of the semiotic theoretical premise has been an obstacle to the formulation of the right definition of the perceptual communication based on expressive qualities.

The most important theoretical reference for expressive qualities is Experimental Phenomenology (Bozzi, 1999), which has its epistemological anchorage in Gestalt Psychology and in the theory of immediate perception by Albert Michotte (Thinès, Costall, & Butterworth, 1981). According to this theory, the qualities of the objects are immediately and directly perceived, without any mediation of mental activity (without any unconscious inferences, without past experiences, without internal cognitive symbols, and so on). As a consequence, in this theoretical perspective of immediate and direct perception, in Experimental Phenomenology, the assumption of a stage of representation of the cognitive system is excluded (Bozzi, 1985), to the point that I can state here a *reference fallacy*, similar to Eco (1975), who claims that "referential fallacy" is the false assumption that the meaning of a sign is determined by its referent (i.e., by the reality to which the sign refers). In fact, Eco (1976) postulates the mediation of a concept, of a representation (i.e., the reference).

Qualitative aspects, observed immediately and directly in the perceptual experience – the shape of a weeping willow, the magnitude of a cathedral, and the booming rumble of thunder are never perceptually neutral: they appear respectively sad, majestic, and threatening – can be also called "meanings"; but, as Guillaume (1937) suggests, to use the term "intrinsic sense" is more appropriate theoretically because this locution does not recall the notion of sign.

As an example, we can consider the quality of color as a bearer of manifold expressive characters. A clear and saturated orange expresses happiness. When a person wears clothing with that color, by the specific expressive quality of that color (i.e., to be happy), he/she communicates happiness, irrespective of his/her emotion. Briefly, if X intends to communicate to Y his/her happiness, the following may occur:

a) In the modality mediated by sign, X produces the words "I am happy", and Y hears the words. Since the words are connected with the mental representation of happiness, Y infers the message by X.
b) In the modality based on expressive qualities, X has an orange dress and interacts with Y. Y sees that X expresses, by the empirical data (i.e., the happiness of the orange, the expressive quality of the color), the message of "happiness" of X.

c) This schematic distinction implies a very different set of assumptions. These differences separate two irreconcilable epistemological universes. The first remarkable difference is the assumption of the role of culture. In the semiotics view, culture and communication are interdependent: by culture, the process of signification is actuated; at the same time, the system of signs expresses the products of a culture. In this perspective, a symbol is always a result of a cultural agreement. For example, in front of a traffic light, drivers stop (except in the case of road infringement) because there is a social agreement that establishes the following: if the traffic light is red, the driver must stop his car. As a consequence, the perceptual communication mediated by sign is impossible without a shared code.

Conversely, an expressive fact, such as a color, has an intrinsic sense, also outside any preventive cultural agreement between the actors of communication. The expressive quality taken by a color – the happiness of orange, to use the same example – is not the result of a shared code, neither the result of an opinion, but it is an objective fact. Here, "objective" means what satisfies the criteria of the experimental verification: intersubjectivity, repeatability, and predictability. Regarding this, there is ample literature on the study of expressive events and a large number of experimental research that has investigated perception in children and animals. For example, Schlottmann, Surian, and Ray showed that infants from 6 months are sensitive to the causal structure of launch. From 3 years, children distinguish social causality in reaction events from physical causality in launch events (Schlottmann, Ray, & Surian, 2002; Schlottmann & Surian, 1999; Schlottmann, Surian, & Ray, 2009). Furthermore, Mascalzoni, Regolin, and Vallortigara (2010) found that newly hatched chicks prefer self-propelled objects than objects exhibiting motion caused by physical contact. This preference cannot be explained in terms of any specific learning. This study suggests that perception of animacy is not necessarily influenced by subjectivity or by culture.

Second, the fact that a certain perceptual property, such as a color, corresponds to an expressive quality does not exclude the possibility that a color can be a sign determined by a cultural agreement. To the point that the cultural agreement can even be in contrast with the objective expressivity of the perceptual property. For example, drivers' reactions in front of the traffic light colors is reasonably conventional. But, we can easily imagine a different cultural convention with opposite values: red means "go", and green means "stop". This convention would not be the counterevidence that red color expresses vivacity and alertness and green color expresses calm and relaxation. On the other hand, it is also possible to suppose an influence of the perceptual aspects of the experience on the genesis of the significance, as Rudolf Arnheim claimed:

> Geometrically simple shapes emerge everywhere at an advanced stage of mental development because they are accessible to the limited organizing powers of a simple mind. They are retained in advanced civilisation for the purpose of schematic, symbolic or so-called ornamental representation because they provide the most clear-cut images of the most basic configuration of forces that continue to underlie man's life, and therefore man's thinking, even in refinement and complexity. (Arnheim, 1960, p. 243)

Another important clarification concerns the role of learned knowledge. To maintain that perceptual qualities, and in particular, expressive qualities, are objective does not imply that all perception is intercultural or that it is universal. It is theoretically very important to distinguish the different levels in which culture, cognitive integration, subjectivity, and past experience can influence the meaning of our everyday objects. In a picture of the fourteenth century, the figures correspond to an accurate and complex symbology. A person who does not know the meaning of that symbology "sees" a different art work than someone who knows these meanings. This obvious fact does not prevent the naïve and expert observers from seeing such objective properties as shapes, sizes, colors, and also expressive values. Easily, the expert observer integrates the intersubjective perceptions with his knowledge.

Likewise, past experience, i.e. subjective experience, contributes to seeing the perceptual world with added meaning. As a consequence, past experience implies relevant intersubjective differences: personal memories add private values that other people cannot see because they are just that private. But also this obvious evidence does not imply that all perceptual qualities change in different individuals. The memory is an integration that does not transform objects (Pylyshyn, 1999; Firestone and Scholl, 2016), but it adds meaning to the intersubjective perceptual datum.

To get back to the perceptual communication based on expressive qualities, the choice of a determined perceptual property, e.g., in a design project, can be a deliberate communicative goal. The expressive quality expresses a specific character of the design object and the designer communicates, by perceptual properties, the presence of that character. It is necessary to underline that the term "presence" here has an important theoretical value, because in perceptual communication based on expressive qualities, the properties are just "in presence", i.e., under observation, hic et nunc. In fact, the properties do not refer to something else. That is exactly what Hanslick said about music:

> (…) while sound in speech is but a sign, that is, a means for the purpose of expressing something which is quite distinct from its medium; sound in music is the end, that is, the ultimate and absolute object in view. (Hanslick, 1854, p. 94)

And more recently:

> Most people would say, I think, that, when they hear, for instance, sadness in a musical theme or passage, they do not hear it the way they see the dog in a dog-picture but, rather, the way they see the redness in an apple: not, in other words, as a representational but as a simple perceptual quality. (Kivy, 2002, p. 30)

3. To Externalize Something That Is Internal

From an etymological point of view, "to express" comes from the Latin "exprimere". The Latin word is composed of the prefix "ex", which means "out", and the second part that means "to press". In this meaning, the word "to express" can be defined as to externalize something that is internal, to make something extrinsic that which is intrinsic. In this definition, a difference between internal and external is implied. This distinction is common knowledge. For example, a private thought is inscrutable and closed into the inner personal mind. It is less evident how objects, or the qualities, can have an internal dimension from which to externalize something. This difficulty has historically fueled an unfounded theoretical prejudice. In fact, the prejudice is based on a mistake: to speak about an interior dimension of objects induces, ontologically, attributes that resemble a soul in the object. Experimental research has no title to consider the metaphysical idea of a soul in objects. On the contrary, it is not a metaphysical assumption to maintain that every object expresses the character of its own structural essence. The definition of expression, in relationship to objects, avoids the theoretical prejudice concerning the extrinsic–intrinsic dichotomy: objects, by their own empirical presence, externalize their own specific character. In this meaning, the active form "to externalize" or "to express" implies the presence of a system in which there is also an observer.

I would like to point out that the specific character of an object, which a single object externalized, is not an expressive quality only for one object. For example, because of a determinate shape, a weeping willow expresses sadness; but the same expressive quality, the sadness, can also be expressed by the posture of a human being (depressed) or by a minor chord. In other words, expressive qualities are not specific for one specific object or for one specific object property. On the other hand, expressive qualities do not exist without objects or object properties: sadness needs specific shapes, specific chords, specific colors, specific movements, specific flavors, and so on.

It is now possible to look for the concrete modality of communication by expressive qualities. Expressive qualities cannot express by themselves a character; they require something with which to make an expression: an "expressing". The expressing can be a single quality (shape, size, weight, color, timbre, flavor, etc.),

an object globally considered (a Gestalt) or relationships between objects (including relationships between objects and their contexts).

Regarding single qualities, a particular color, for instance, may express by itself an intersensorial character. The opposition of warm *versus* cool colors is well accepted (see Arnheim, 1974). In any case, the expressivity of one color is sometimes only an abstraction, because every perceptual variable of objects is normally influenced by other perceptual variables or by the whole. For this reason, the expressive value of a single quality is usually a result of a dynamic interrelation of phenomenal variables. Therefore, considering the global object, a good example is the human walk. Kurt Koffka had already observed as follows:

> The slow dragging movements of the depressed, the jerky, discontinuous movements of the irritable, correspond indeed to the leaden state of depression or the distrupted state of irritability. The one, viz. the overt side, is as much depression or irritability as the other, the conscious side. Therefore it is meaningful to say that *real* behaviour, (…), emotional. (Koffka, 1935, p. 658)

The human walk is, therefore, an insightful example to clarify that an invariant may be a medium to express a specific character of an object. In the 1970s, Gunnar Johansson studied biological motion (Johansson, 1973; Jansson, Bergström, & Epstein, 1994). He demonstrated that only a few light dots (about 12) – carefully positioned on the body – are sufficient to recognize the human walk in the dark. The global pattern was a perceptual invariant. Other investigations demonstrated that, by specific invariants, observers easily recognize the walk of a male or a female, the walk of an old or a young person, and whether they are happy or sad, nervous or relaxed, light or heavy, etc. (Dittrich, Troscianko, Lea, & Morgan, 1996; Clarke, Bradshaw, Field, Hampson, & Rose, 2005). In other words, the observers do not project a subjective expressive value to the objects; however, they immediately recognize the expressive qualities that are reducible to invariants by a few dots that, over time, maintain a coherent structure. Here, there is the possibility to isolate, by this invariant structure, expressive qualities. The invariant structure is also a very useful theoretical instrument because, by vector analysis, it is possible to run models mathematically for the transposition of expressive values.

Expressive qualities can be expressed also by relationships between objects. Observers recognize happiness or sadness in biological motion by the perception of expressive invariants, the same as in the experiments of Michotte (1946) and Heider and Simmel (1944) for the recognition of dominance or compliancy in interpersonal relations. These classical studies are good examples of how human observers directly perceive specific interpersonal relationships by the motion of simple perceptual patterns. In fact, they demonstrated that simple

geometrical figures (such as squares or rectangles) – when in motion – establish determinate anthropomorphical interpersonal relations (without any physical meaning, because, in the experiments, geometrical figures had obviously independent movements) only if they respected determined perceptual conditions. It is important to emphasize that expressive events do not rest upon the variables considered as entities measurable with physical instruments. Expressive qualities "rest upon this level of reality, which is the reality directly shown by observable things, measurement aside" (Bozzi, 2019, p. 364). A paradigmatic example is the launching effect (Michotte, 1946): if a red square moves immediately after perceived contact is made by a preceding black square, the motion of the red square is reported by the observers to have been caused by the black. The first perceptual condition is the value of the time interval between the moments of contact of the squares. The second condition is the ratio of the velocities of the red square to the black square. The third is the length of the path of the red square. The same outcome is achieved in the acoustic field. For example, Anolli and Ciceri (1997) investigate the production of emotional expressions (encoding) and their recognition (decoding). They show how patterns of acoustic variables (in particular, tempo – i.e., the temporal regulation of the production and articulation of the phrase – frequency, and amplitude) can contribute to the process of determining the recognition of emotions. These findings constitute a very important theoretical goal because, by perceptual laws, it is possible to define the structures of the expressive events.

4. Plurivocity

As already mentioned, expressive qualities are transobjective: the same expressive quality may be equally expressed by different properties (such as shape, motion, weight, color, taste, tone, and so on), objects, or relationships between objects. Menace is perceived equally by the crescendo of thunder, the sound of a chord, a facial expression, or a particular light. On the contrary, the same objects can share many expressive characters. In this case, objects are expressively "plurivocal" (I prefer to use the term 'plurivocal' instead of 'polysemic' to avoid the semiotic lexicon). Plurivocity has been studied extensively in ambiguous or bistable figures. Conversely, there is no literature regarding expressive plurivocity. It is common experience that the same musical chord, for instance, may express together sadness, bitterness, and also solemnity; the table top may express together hardness, solidity, and also levelness. These different and compresent expressive qualities have different perceptual saliences. Several conditions determine the perceptual salience: the observer, the object, and the context.

First, the observer can intentionally fix the focus on a particular expressive quality over the others. The observer's disposition is widely oriented by the object and,

in any case, the observer cannot force the expressive value. A depressed mood cannot see sadness in the lively color or in the happy sound of the trumpet of the Carnival. Even in these cases, these expressive values generate an egodystonic subjective response.

Concerning objects, different and compresent expressive qualities can appear more or less salient. This is the value of plurivocity. With a low value of plurivocity, a single expressive character prevails over the others and focuses on itself all the global expressivity (e.g., chord structure, temporal organization, and sound amplitude may together express sadness). In general, with low plurivocity, objects show a single and clear expressive identity and they are perceptively more intelligible. When objects have a high value of plurivocity, multiple expressive characters may be equivalent, and it is impossible to separate one prevalent expressive character (e.g., chord structure may express sadness, temporal organization may express agitation, and sound amplitude may express solemnity, all in the same musical passage). Objects with high plurivocity, in general, have the advantage of avoiding aesthetic glut.

Plurivocal objects can also include cases of contrasting expressive characters that generate perceptual incoherence. A good example of this is given by the face makeup of clowns, in which – typically – the eyes are sad and the mouth is smiling (see Figure 1). In this case, the contrast of two opposite and robust expressive characters prevents the normal perception of the expressive unity of the face.

Finally, the context also can determine the predominance of one among the multiple expressive characters in the plurivocal object. The perceptual effects that govern the relationship between the plurivocal object and the context can be the contrast but also assimilation. Assimilation determines an effect of objective observation called "objective setting" (see Metzger, 1941). In Figure 2, for instance, the eyes appear happy on the left and sad on the right, even though, physically speaking, the areas of the eyes are identical. In this case, the different expressions of the mouth influence, by assimilation, the perception of the eyes (Bayer, Schwartz, & Pelli, 1998).

All these objective determinations do not exclude subjective differences regarding sensitivity in perception of expressive qualities. Different subjects can perceive different values of expressivity. The differences do not demonstrate the relativity of the actual world, as claimed by radical subjectivists, but only the necessity of a critical approach to evaluate the real features of the world. In fact, different subjects also, with different perceptual dispositions, perceive the same expressive qualities if they are put in the same observational conditions and if they have the same perceptual goal.

Fig. 1 An example of contrasting expressive characters. The eyes are sad, and the mouth is smiling.

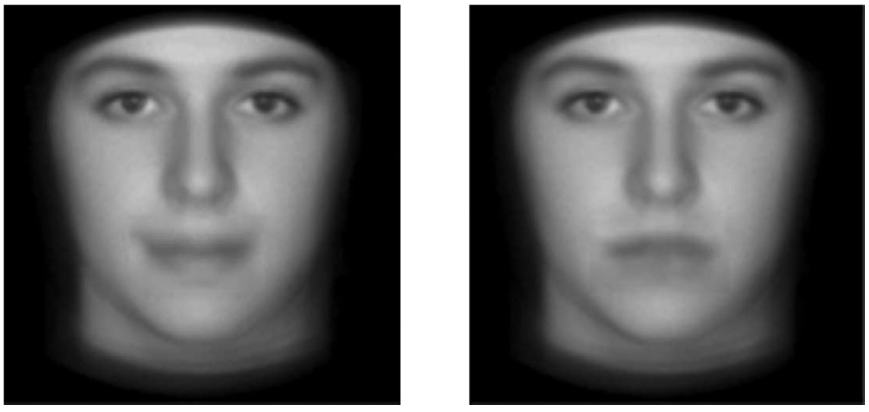

Fig. 2 The expression of the eyes (identical in both the images) changes as an effect of assimilation with the expression of the mouth (from Bayer, Schwartz, and Pelli, 1998).

5. Conclusion

In conclusion, the theory of expressive quality represents an important tool for perceptual communication. It aims to provide a useful framework, for instance, in design sciences, where the user experience is often dominated by emotional qualities (Norman, 2004). Unlike semiotics, through expressive qualities, communication concerns the properties of the objects that are immediately perceived (and, therefore, without any subjective reference to other indirect knowledge), universal (and consequently without any difference between any other subjects and cultures), and then intersubjective.

As a complement to the qualitative studies, by the tradition of Experimental Phenomenology, recent studies within Ecological Psychology and the paradigms on biological motion present the possibility of extracting structural invariances of the expressive phenomena. From these results, quantitative models for the transposition of expressive values can be obtained.

Summary
The present paper introduces the theoretical conceptualization of perceptual communication through expressive qualities. Initially, the difference with respect to the modality of perceptual communication mediated by signs is analyzed. Conversely, the theory of expressive qualities reflects the psychological conception of direct perception: any assumption of a cognitive stage of representation is excluded. Perceptual communication immediately expresses the specific character of the structural essence of the object. The structural essence is well studied by the perceptual paradigms of Experimental Phenomenology. Plurivocity, the case in which the same objects can share many expressive characters, is also considered.
Keywords: expressive qualities; perceptual communication; plurivocity; experimental phenomenology; Gestalt psychology

Kommunikation durch Ausdrucksqualitäten

Zusammenfassung
Der vorliegende Beitrag stellt das theoretische Konzept zu wahrnehmungsbasierter Kommunikation durch expressive Qualitäten vor. Zunächst wird der Unterschied zum Modus der durch Zeichen vermittelten wahrnehmungsbasierten Kommunikation analysiert. Umgekehrt spiegelt die Theorie der Ausrducksquailtäten das psychologische Konzept direkter Wahrnehmung: jede Annahme von Stadien kognitiver Verarbeitung wird ausgeschlossen. Wahrnehmungsbasierte Kommunikation drückt unmittelbar den spezifischen Charakter des strukturellen Wesens des Objekts aus. Dieses strukturelle Wesen ist durch die Wahrnehmungsmuster der experimentellen Phänomenologie gut erforscht. Plurivität, also der Fall, in dem dieselben Objekte viele ausdrucksstarke Zeichen miteinander teilen können, wird ebenfalls berücksichtigt.
Schlüsselwörter: Ausdrucksqualitäten, wahrnehmungsgeleitete Kommunikation, Plurivität, experimentelle Phänomenologie, Gestaltpsychologie.

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