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Multimodal literacy, and the spectrum of communicative possibilities furnished by non-verbal devices

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Abstract

In this article, consideration is given to the process of utilizing multimodal techniques in the process of producing communicative content. A brief overview is given to the principal categories of non-verbal devices and means that are studied in the field of multimodality, including some specific items which are included in those various classifications. Some attention is given to the manner in which the technological advances of the digital age have been interlinked with the proliferation of non-verbal devices in so many texts of various types to which individuals are exposed nowadays. A significant part of the article is devoted to the issue of multimodal literacy, both as reflected by the manner in which multimodal techniques are employed by the creators of content, and the manner in which recipients of this content are able, to varying degrees and for various reasons, to arrive at a perception of the message that is being conveyed.

Keywords: *verbal, non-verbal, multimodality, literacy, graphic*

Abstrakt

W niniejszym artykule rozważania skierowane są na proces praktycznego wykorzystania technik multimodalnych w trakcie tworzenia aktu komunikacji. W sposób skrótowy przedstawione są podstawowe kategorie narzędzi niewerbalnych oraz środków, które są przedmiotem rozważań w sferze multimodalności, w tym te, które zawarte są w przedstawionej klasyfikacji. Ponadto, uwaga skupiona jest na sposobie, w jaki następuje technologiczny rozwój cyfryzacji w połączeniu z procesem proliferacji środków niewerbalnych widocznych w wielu różnorodnych tekstach, spreparowanych dla odbiorcy. Znaczna część artykułu poświęcona jest przypadkowi multimodal-

nej sprawności, zarówno w odniesieniu do sposobu, w jaki multimodalne techniki są wykorzystywane przez twórców treści a także sposobu, w jaki odbiorcy tych treści są w stanie na odpowiednim poziomie zrozumienia odebrać zawarte w nich informacje.

Słowa kluczowe: *werbalny, niewerbalny, multimodalność, umiejętność, graficzny*

Introduction

Language and the human capacity to utilize it effectively, have been fundamental preoccupations of human beings from time immemorial. As the development of language has reached progressively higher levels, the options for interaction provided by it have become more extensive. Observing the history of civilization, it can be seen that people on the whole are constantly in search of anything that can bring about some type of improvement. This is a natural phenomenon, so it is not surprising that population groups through the ages have been involved in a constant process of language development in order to adapt it so as to make it serve their needs in a more satisfactory manner. At the dawn of civilization primitive pictures began to be created as a means of communication which could be preserved for an extended period of time, and which could be conveyed to distant places. This innovation represented a significant breakthrough for people in that time period. Subsequent generations were evidently not fully satisfied with the means of interaction which they inherited from their ancestors, and proceeded to develop other systems which were further refined and extended. The overall sequence involved in the appearance and development of writing systems could be succinctly presented in the following terms: *clay tokens → pictorial writing → cuneiform → hieroglyphics → syllabic writing → logographic writing → alphabetical systems → ?* We intentionally left the last place blank, followed by a question mark, because textual creation in modern English is still in the process of development, suggesting the potential for the emergence of new forms and means of interaction. Various graphic means and effects are used to make this communication livelier, more effective, and more likely to capture the attention of casual observers than it would be possible using traditional textual patterns.

Over the course of the centuries during which languages have developed, particularly in advanced societies, scholars have been compiling dictionaries, then grammar books and later style guides for recommending or else even forcefully prescribing the forms and usages of all the various elements of

their written languages. This pattern is to be expected when people begin with a vague concept or idea, and then spend a certain amount of time pondering how the concept can best be conveyed with the devices furnished by their languages, constantly bearing in mind the usage rules and guidelines that they know their target audience will probably have absorbed during the course of standard education. Multimodality represents a different kind of field for a number of reasons.

One obvious factor is that the field is relatively new, and there has not been time for prescriptive patterns to be formulated or applied. Another factor stems from the reality that many multimodal elements are generated spontaneously, without lengthy premeditation, and it could be argued that this will often be one of the conditions under which distinctive symbols are likely to be used or even created.

Computer technology and multimodality

It could be argued that the functionalities available to us in the digital age are what propel the development and standardization of multimodal devices. Technology enables us to be exposed to the output of individuals living in any part of the world, and new ideas and approaches can spread much more rapidly than it would have been possible before the digital age. However, the availability of a huge range of typefaces, colours and styles of text affects the way in which we approach the process of expressing ourselves: some decision must be made about the manner in which we use these resources in order to: (1) convey in the most effective way what we are really wishing to express, and (2) make the most powerful impression on our target audience.

An individual setting out to give expression to some type of content may have a variety of motives:
  – to convey a certain concept or idea, without much attention to the form of the presentation;
  – to demonstrate proficiency in the act of presentation, with less thought devoted to the actual content;
  – to formulate a way of effectively organizing content, but simultaneously considering the form and style of the presentation that are likely to produce the most powerful intellectual and/or emotional reaction in the target audience, with respect to the message that is being transmitted. Creators of content are sometimes preoccupied greatly by both of these aspects, but at other times one of these aspects is given importance at the expense of the other.

One example of concentration on form could be given by pointing to a case where a text is being prepared for printing, and the author considers at length how to choose a typeface that will be in harmony with the tone he wishes to set in his presentation: a 'silly' typeface would seem totally inappropriate for an article dealing with serious historical, philosophical or political issues, for example. Likewise, the abundant or excessive use of underlining, italics and boldface will undermine the respect of readers for the author as a person whose thoughts are worthy of serious consideration. In the same vein, a person preparing to give a speech or to make some type of oral presentation is likely to consider the clothing or the accessories that will reinforce the basic message that he or she is intending to present; conservative clothing does not necessarily undermine a presentation intended to amuse or entertain, but careless or casual dress patterns could weaken a presentation where serious ideas are being set forth.

To return to the issue of technology as it relates to multimodal devices, it is interesting to consider that when no mechanical method existed for producing written discourse (or mechanical methods were not readily available to the general public), producers of content had to utilize handwriting and were in some ways restricted, but at the same time, they had considerable freedom of expressing themselves by their writing, and by their liberty to introduce symbols or to use emphasizing techniques in whatever way they chose. It is interesting to consider, however, that there are also specific constraints associated with this medium: for example, children are given very specific instruction about the way in which letters are to be formed in cursive writing, and sometimes are even awarded prizes on the basis of their application of those rules. However, combining adherence to established patterns of forming letters with artistic sensitivity can produce an effect that is more impressive than mere technical expertise could ever create.

When mechanical typewriters appeared, they removed the element of individuality and skill from the process of generating visually satisfactory textual content: to a large degree, the output of a typewriter is uniform and anonymous. However, producers of content could indicate a ranking of the importance of words presented by using underlining, or by backing up the typewriter carriage and typing the same words repeatedly, producing an effect similar to boldface in professional typography. These were primitive examples of some features that we now include among multimodal devices.

The introduction of computer technology made all the resources of a printing workshop available to even the most casual or inexperienced user. Increasingly, it made a variety of non-alphabetic symbols available, as well as

opening up almost unlimited choices of typeface and presentation. However, at the same time as it expanded choice enormously, it imposed restrictions on the forms that could be used by the producer of content, compared with what was possible when pen and paper were the medium in use.

When mechanical methods of presenting text are used, every symbol that appears is generally the result of a conscious decision on the part of the author in terms of both form and content. In contrast to this, handwritten messages (and to a much greater degree, spoken messages) can contain content that is spontaneous or even unintended. There is a great difference between these media in terms of the process of correcting unintentional output: words once spoken cannot be retracted; words once placed on paper with a typewriter are difficult to eradicate, although more and more ingenious methods were invented for doing that over the years; but content produced on a computer can be corrected and revised endlessly without leaving visible traces of the forms that were used initially. These various factors have an effect on the finished product, even if the reader is not aware of the process that created the output. These concepts are useful to keep in mind when we consider the specific semiotic resources which are now visible in the texts which we can peruse.

A symbiosis of different semiotic resources and their group typology

The presence of both verbal and non-verbal elements in contemporary written communication is a phenomenon that can be observed in various domains; this pattern is particularly evident in the discourse that occurs in social networks and in interpersonal dialogue using electronic devices of various kinds as well as in the mass media. When a skilfully-conceived symbiosis of verbal and non-verbal components is achieved, it can significantly enhance the effectiveness of the message that is being communicated. At the same time, a message can only be effective to the extent that its recipients are equipped to perceive the meaning which the message contains. On account of this, it becomes highly meaningful to give attention to both of the thematic components presented in the title of this article, "multimodal literacy" and "the spectrum of communicative possibilities furnished by non-verbal devices."

The conceptual synthesis which has been presented in the preceding paragraphs can serve as a jumping-off point for a number of different types of investigations. In this present article we intend to devote attention to some ways

in which multimodality actually functions in a practical sense, the forms which that interaction may take (using a number of different semiotic resources), and the general characteristics of the phenomenon from a practical standpoint as well as the potential and possibilities of this resources.

In addition to some well-known and generally accepted means of a graphical nature which are nonetheless linked with verbal communication, we would like to mention a number of non-verbal semiotic resources which can be observed in the modern mass media and which are worthy of further research and consideration. In our previous research, several major groupings were devised to encompass the graphic means and effects of a non-verbal character which are utilized in the modern English communicative space along with verbal means.

The first subcategory we wish to mention consists of *segmentation and other graphic effects*, involving features such as the location of text on the page or text positioning/orientation (which may be vertical, horizontal, diagonal or situational); visible corrections of letters or words including the use of strikeout text; insertions of different elements; underlining and highlighting; the non-standard juxtaposition of words without intermediate spacing; and the manipulation of margins, text width, and page orientation.

Another subcategory involves characteristics related to *font* and *colour*, including italicization, capitalization, boldface accentuation (partial or full), and unusual patterns of writing words by manipulating fonts.

Yet another subcategory comprises *non-pictorial and non-photographic graphic elements* such as: punctuation marks (full stops/periods, commas, semicolons, exclamation marks, question marks, colons, dashes, single and double quotation marks, round brackets (parentheses) and square brackets; apostrophes; various diacritical and accent marks. (acute accents, grave accents, circumflexes, diaereses, tittles, macrons, breves, cedillas, tildes).

Reference can also be made to *typographic and subsidiary signs which include other elements* (numbers, mathematical symbols, formulas, and text language abbreviations); *iconic elements or images*, which may consist of pictures of all the varied types (still lifes, landscapes, paintings, any drawings created with a pencil or paints or produced using computer software); even including cartoons, comics and any other non-photographic illustrations; pictograms (iconic, abstract, or logotypic); logotypes or emblems; maps, photos, and similes); and *other non-verbal means* (graphs (bar graphs, line graphs, pie graphs and scatter plots), diagrams and tables).

It is evident that a great variety of means can be used in written interaction. It is often challenging to achieve a definitive identification of the ele-

ments might be referred to as being the 'central' ones in multimodal interaction, and it might in fact be useful to try and develop some techniques for analysing different modes which coexist in one utterance that could enable the observer or researcher to devise at least a tentative evaluation as to which type of device is genuinely the most critical one within any given text.

Existing research approaches to the analysis of multimodal texts

Taking into account the information given above we can affirm that multimodality is one of the most important areas meriting further consideration in modern linguistics. This research problem has been studied in depth by Gunther Kress (Kress, 2001; 2006; 2010), Jeff Bezemer (Bezemer, 2016) Jewitt Carey (Carey, 2016), Theo van Leeuwen (Leeuwen, 2001; 2006) and by Kay O'Halloran (O'Halloran, 2011; 2016). The relationships between images and text were also examined by John A. Bateman (Bateman, 2014). Thanks to them, many present-day scholars can work with aspects which were "in the shadows" for a long time, since only verbal devices in written discourse were considered linguistically valuable and deserving of further research and consideration. Modern scholars concur in their positive assessment of the significance of verbal and non-verbal elements which are used in both oral and written speech acts.

The phenomenon of multimodality has doubtlessly attracted the particular attention of linguistics scholars due to the fact that non-verbal (paralinguistic) elements may accompany a text or be incorporated within a word, a word combination or a sentence (Makaruk, 2012). In modern linguistics it is necessary to provide an in-depth examination of all the significant aspects of non-verbal elements, studying their linguistic value in the overall context of multimodal discourse analysis (Kress, 2001) as well as in the specific areas of visual grammar (Leborg, 2006), systemic functional-multimodal discourse analysis, multimodal metaphor, and social semiotics. The most detailed study is O'Halloran's (2011) paper, which also deals with multimodal areas such as context-text relations, paradigmatic meaning ranking, metafunction, instantiation, and intersemiosis.

One means by which it is possible to examine the relationships between images (pictures or photographs) and non-image media which are nonetheless graphic in character (such as figures or punctuation marks used in an atypical way) on the one hand and verbal elements on the other is to approach multimodal texts using systemic and functional analysis patterns, which can demonstrate how meaning is conveyed by a combination of dif-

ferent semiotic resources. The concept of using systemic-functional analysis to reveal the level of modality (partial or full), was advanced by Yelena Anisimova (Anisimova, 2003) where the partial modality implies a relative independence of the verbal component from the image. In full multimodality neither the verbal nor the non-verbal component can function autonomously.

In the study that Gunther Kress published in 2010 (Kress, 2010), he gave some consideration to both social and cultural aspects, and he directed attention toward the interplay of text and graphic imagery, giving some views with respect to the interpretation of individual images. It is our opinion that this approach could be a launching pad for an even more extensive study, utilizing the tools that are provided within the fields of semantics, sigmatics, syntactics (syntax) and pragmatics, as touched upon by Rayan Abdullah and Roger Hübner in their 2007 study (Abdullah, Hübner, 2007). It can be postulated that undertaking an investigation based on these principles will enable us to illustrate the communicative power and the meaning of multimodal texts more effectively, and to provide a comparison of verbal and non-verbal means. Since communication is a sociocultural phenomenon, the people and the communicative space where the elements are functioning represent an important factor.

An overview of possible avenues for the investigation of multimodal texts has also been given in the book *"Introducing Multimodality"* by Carey Jewitt, Jeff Bezemer and Kay O'Halloran (Jewitt, Bezemer, O'Halloran, 2016). Its authors provided a step-by-step description of key analyses which are employed in the investigation of multimodal texts; in addition to the systemic functional approach and social semiotic analysis. They also give a full description and an exposition of the ways in which geo-semiotics, multimodal (inter-)actional analysis, multimodal ethnography, multimodal corpus analysis, and multimodal reception analysis can be applied.

Multimodal vs. monomodal texts

In a very general sense, all texts can be categorized as being either multimodal or monomodal; the latter type includes those which consist of homogeneous modes (verbal or nonverbal), such as those containing exclusively words, or images, or numbers (the latter being regarded as a separate independent mode).

We are inclined towards the opinion that there is no such thing as a completely monomodal text. One reason for this conclusion is the fact that any written text is produced by making conventional graphic marks in manu-

script form and/or in print. Oral texts which originate in the mind of a speaker then appear on paper and become graphically verbalized, so to speak. It is generally assumed that the words that we see on the corresponding graphic membrane belong exclusively to creations of a verbal nature. However, in the investigations of many researchers font, as a text formatting device, fits into the category of paralinguistic means.

As we convey this point of view, we observe that a font as a discrete mode can have a large number of different sets and point sizes. Based on this, we believe that the result of using these different sizes and varieties of font in the formatting of a text cannot be classed as being monomodal. In addition, virtually every text has punctuation, which is yet another separate mode, and this once again testifies to the fact that texts which include graphic verbalization and punctuation marks such as commas, periods, and dashes, are multimodal. It is relevant to note that boldface emphasis (full or partial accentuation), non-standard spelling, and the simultaneous usage of multiple typefaces and font sizes provide support for including them in the category of multimodal texts. By the same token, texts in which the typographical characters are all of a uniform type and size can legitimately be classed as being monomodal.

In addition to punctuation marks (full stops, commas, semicolons, exclamation marks, question marks, colons, dashes, single and double quotation marks, brackets (round and square), dashes, apostrophes), attention should be given to diacritical symbols (acute, circumflex, and grave accent marks, the macron, the tilde and others), typographical and other supporting symbols; figures; mathematical symbols; abbreviations which consist exclusively of non-verbal or units which combine verbal and nonverbal components simultaneously. No diacritical marks are included in the English alphabet, but we encounter them in contemporary English texts in the form of diacritical symbols inherent in verbalizations of foreign origin which are widely used in English. Text structures often contain numbers and mathematical symbols. This once again demonstrates that the majority of English texts are multimodal.

Texts comprising only one-colour photographs or illustrations could be classed as monomodal. In such cases, colour cannot be disregarded, as it is a significantly powerful semiotic resource that mostly is an integral component of the text. Even black and white photographs involve combinations of the two colours black and white (including the various intermediate shades), so they can also be categorized as being multimodal.

An analysis of actual material provides justification for believing that multiple modes are simultaneously involved in the production of texts. They

may be limited in number and depend on various criteria. The highest proportion in the modern English language communicative space is made up of texts that are verbal or pictorial in content. Texts containing tables and graphs (columnar and circular), charts and diagrams are quite common. It should be noted that English multimodal texts include multiple semiotic resources belonging to various groups which we have already referred to above. The number of possible textual variations is actually inexhaustible. Creators of text have an unlimited choice of semiotic resources. Among the most common models the following may be singled out:

– verbal means (typical words made up of the English alphabetical symbols) – punctuation marks – still lifes/landscapes/pictures/cartoons/comics/non-photographic illustrations/icons/logos/emblems/maps/photos/smiles/color;

– verbal means (typical words made up of the English alphabetical symbols) – punctuation marks – diacritical marks – still lifes/landscapes/ pictures/cartoons/comics/non-photographic illustrations/icons/logos/ emblems/maps/photos/smiles/color;

– verbal means (typical words made up of the English alphabetical symbols) – punctuation marks – figures – still lifes/landscapes/pictures/ cartoons/comics/non-photographic illustrations/icons/logos/emblems /maps/photos/smiles/color;

– verbal means (typical words made up of the English alphabetical symbols) – punctuation marks – mathematical symbols – still lifes/landscapes/pictures/cartoons/comics/non-photographic illustrations/icons/logos/emblems/maps/photos/smiles/color;

– verbal means (typical words made up of the English alphabetical symbols) – punctuation marks – graphs – scatter plots – tables.

Additional observations concerning certain typographical features which serve as a separate mode

We have already mentioned some features which deserve particular attention, including the placement of text on the page, line spacing, page orientation, margins, text width, positioning of the text, corrections, underlining, insert, strikethrough, highlight, and intentionally merging text components without the required intermediate distance. The placement of text on a page, line spacing, page orientation, margins, and the width and positioning of text are key parameters that influence the appearance of the final text which is produced.

Font is unquestionably no less important as a parameter of multimodal texts, including font variations (writing in italics, capitalization, bold selection (full or partial accentuation), non-standard spelling, and simultaneous usage of multiple fonts and sizes. In most cases, it is impossible to avoid using font membranes and it is hardly necessary, because the words (consisting of letters) that compose multimodal texts are the most popular and most frequently used semiotic resources that are common and are appealing to recipients, even if they sometimes are not very powerful, unlike semiotic resources of a pictorial nature.

These means constitute a phenomenon which can be referred to as a graphic play, which can be understood to signify manipulation by graphic means. All in all, they produce a special effect and contribute to the emergence of graphic synonymy, antonymy and polysemy.

Multimodal literacy

It seems evident that the way in which verbal and non-verbal elements are arranged plays a part in guiding the reader towards the meaning which the creator of the text is seeking to convey; successful communication in this domain hinges on users being able to understand these realities, and their aptitude in employing these devices. The general term used by scholars to denote this aptitude is 'multimodal literacy' (Kress, 2004). Multimodality and multimodal literacy are connected with the inclination of potential target individuals to accept certain signs as representing some kind of reality with which they are already familiar. Certain signs are easily accepted because they incorporate elements that are already familiar because of having some structural similarity to alphabetical characters. Other signs are readily accepted because they correspond to widely-accepted symbolic or iconic patterns.

It is useful to evaluate and to provide a ranking of the relative significance of factors which make newly-appeared signs acceptable or even appealing to a potential recipient. When the new symbol possesses some element of familiarity, that familiarity would no doubt qualify as the primary factor. Some intuitive factors could also have a bearing on the process; certain signs incorporate some emotive element in a direct or else in a subliminal manner, and this may manipulate our reactions with or without our being aware of the process.

Another possible factor is the degree to which a sign activates the innate curiosity of individuals regarding the functioning of new or apparently novel phenomena. If a sign can also actuate our sensory apparatus by evoking recollections of impressions which we have received by some other sensory

process besides our visual ability to recognize and recall a static graphic image, that sign could have some unique qualities.

Many different techniques could be devised for investigating the process by which multimodal literacy exists or can be developed. It is also interesting to consider the possibility of investigating potential associations of apparently static signs and movements with gestures which have an inherently dynamic character. It would be interesting to explore whether the graphic images that have evolved in languages with ideograph-based writing systems (such as Chinese) for representing certain concepts ever have recognizable counterparts in the animated representations found in sign language, for example. With alphabetical and numerical symbols, a prior learning process is necessary for a recipient to receive any significant message, but in the case of multimodal devices, many devices and characters are available that may convey meaning even to a recipient with no particular training.

With respect to English, we have arbitrarily designated certain typographical devices such as underlining and italics as having some bearing on meaning. Some of these techniques could be considered as counterparts to the intonational techniques in audible speech, and in other cases to the hand or head motions which accompany these varieties of vocal intonation. However, there are strong discrepancies between some of these gesture-based signs; for example, the nodding of the head in a certain manner which implies agreement in western European countries has exactly the opposite meaning in Albania.

Much thought has been given to the possibility of applying the same types of analysis to multimodal texts which have been used for many years in connection with conventional textual material, accompanied by the assumption that it may be possible to identify many of the same phenomena on a multimodal level which can be found in standard literary texts. However, it seems probable that this line of reasoning can only be applied to a limited degree, for various reasons.

One point is that, as opposed to situation with 'ordinary' textual material, the circumstances under which multimodal devices most often originate are such that the texts are produced rapidly by their creators, and designed to be perused rapidly by their observers – so the careful process of drafting and refining that produces feature-rich and sophisticated literary works is generally (if not always) absent in this digital age, and in the media where we generally find multimodal devices. If we compare periodicals (newspapers and magazines) of the 1920s, the 1970s and the current decade, it becomes very evident that in general, people nowadays have a much shorter attention span than their ancestors, and are much less willing to read a long text, or to

try to extract subtle meanings that may or may not be embedded in a text. Those who create textual and visual content are well aware of this trend, and they deliberately or unwittingly contribute to this evolution by tailoring their production to the 'lowest common denominator', as it is sometimes referred to. We may deplore this, but the movement is basically irresistible in the modern world. We must bear this in mind as we try to gain an overview of the circumstances under which multimodal texts originate.

It must also be borne in mind that both the producers of multimodal material and those who are its potential audience are quite varied in terms of the experiences and the influences that have shaped them. Various types of criteria could be considered for classifying this audience: in terms of innate abilities and aptitudes, people who are inherently artistic, or who relate more readily to visual than to textual messages, are likely to be much more receptive to multimodal devices of a pictorial nature. This hypothesis could be explored in various ways; for example, sets of different multimodal devices could be shown to different individuals, asking them to give a ranked assessment of the different items on a page, based on one criterion or another. For instance, a comparison could be made of different ways of presenting contrast or antonymy, such as the contrast between a frowning and a laughing smiley-face, and the contrast between conventional text and sloping text, or some other device where contrast or dissonance can be identified.

The cultural background of individuals would need to be considered, and the ways in which this background could have a bearing on multimodal literacy. This type of research might be easiest to conduct in a community that includes many immigrants from different cultures. In some larger cities with a considerable number of expatriate foreign residents, a survey could be conducted among the students from various countries, to see if their responses, and their way of ranking or assessing the effectiveness of multimodal devices, or of interpreting them, is significantly different from the responses given by people who were born and raised in a Ukrainian milieu, for example. It would be possible to communicate on some occasions with visitors from western Europe who could provide another sample audience.

It is also necessary to take into consideration the circumstances in which individuals have grown up. People who have been raised in an urban environment from infancy are constantly exposed to a mixture of textual and graphic characters all around them – on the facades of business, on the billboards, and in the various shopping centres and stores that they often have a chance to be in. They also have ready access to libraries and various cultural activities. Children from rural communities in Ukraine (to a greater

degree than in many western countries) have a lifestyle that exposes them to fewer literacy-stimulating activities or venues, so it can be anticipated that on the whole, their reactions to multimodal material are likely to be different from those of their urban counterparts.

The more these various aspects are considered, the more evident it is that studies relating to the formation of multimodal literacy may extend in a large number of different and fascinating directions. We look forward to pursuing our investigations in these areas in the future.

Conclusion

The process of drawing material together for the compilation of this article has provided a most interesting and satisfying opportunity to take a fresh look at the phenomenon of multimodality, especially giving attention to the evolution of the devices and means which we refer to in this connection. It has been useful to review the principal classifications of non-verbal devices and means which we have devised in previous research, or which have been devised by other researchers in this field. Our consideration of the relationship between digital technology and the development of non-verbal devices led us in some interesting directions which we hope to pursue in greater depth at some point in the future. We also see great promise for fruitful investigation and theorization in the area of multimodal literacy; we look forward to developing to a greater extent some of the lines of study which have been touched on in this article, with respect to various characteristics of content producers which influence the process of generating multimodal material, and perhaps even more significantly, the many factors which could play a role in the degree to which recipients may be able to accurately decode the messages contained in multimodal discourse.

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