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# Users' perception of Aboutness and Ofness in Images: an Approach towards Subject Indexing Based on Ervin Panofsky's Theory and Users' View

**ABSTRACT**

It is widely accepted that subject indexing of an image is based on a two-dimensional approach. The first is the ofness and the second focuses on aboutness of the image. Assigning a suitable set of subject tags based on these two groups depends, to a great deal, on what is the users' perception of the image. Thus this study aims at analyzing users' perception of aboutness and ofness of images. 25 in-depth semi-structured interviews were conducted in two phases. In the first phase a collection of 10 widely known photographs were given to the interviewees and they were asked to assign subject tags (as many as they wish) to each image. In the second phase some facts regarding each image were given to him/her to assign further tags (again as many as they wish) or even modify their previous tags. The results show that the interviewees do focus both on ofness and aboutness in subject tagging; but it seems that they emphasize more on aboutness in describing images. On the other hand, as soon as the interviewees were able to distinguish the iconographical ofness, they could speak of iconographical and iconological aboutness. The results also show that subject indexers must focus on the iconographical level, especially regarding those tags which represent the ofness at this level.

## Introduction

Subject indexing of images is a matter of problematic nature from different perspectives. The first and maybe the most important issue, deals with the lack of standard or universally-applicable code for a meaningful subject representation of an image. Although it is widely accepted that subject indexing of an image is based on a two-dimensional approach (i.e. ofness and aboutness description), the problem still lingers in determining the depth of descriptions especially when it comes to aboutness. Based on ofness/aboutness approach the subject tags to be assigned to an image could be divided into two different groups. Those which describe the

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things or objects depicted in the setting of an image constitute the ofness; and those tags which describe the matter of theme or the story expressed in an image fall into the aboutness group. On the other hand, most of the well-established literature in the field of subject access to images focus mainly on the works of art and other cultural heritage objects. Yet still remains disputes regarding the whole process of subject description of image while most of the existing literature have focused on subject access to the works of art (moving or still) (Yee,1990; Shatford lane, 1994, 2002; Kessel, 2011). Yet other pictorial works with special characteristics are being constantly neglected. News images or scientific figures are among them. This paper attempts to address the problem from a different perspective (users' point of view), based on a different test bed (News Images). Thus this study aims at analyzing users' perception of aboutness and ofness regarding news images. Users' perception is of significance because it shapes the keywords through which users decide to search any image database or even the Web. In order to set a framework for analyzing users' perception, ofness/ aboutness of the images used was interpreted in light of Panofsky's theory.

### Ofness/ Aboutness and Panofsky's Theory in Iconography

As Shatford layne (2002) puts it, subject access to images is among the most important means through which users can find their desired pictorial works. From this point of view there are two main aspects in subject interpretation of pictorial works; ofness which considers what is depicted in an image and aboutness which deals with the interpretation of the subject matter and identifying what has been symbolized in an image. As Yee (1990) mentions, this aspect covers a broad territory due to the fact that it includes expressional and latent meaning. Thus index terms for images are constantly assigned based on these two aspects.

Although different scientists adhere to the fact that differentiating ofness and aboutness in images is an accountable way for interpreting the subject of them and these two dimensions do give us the clues to select the correct terms for subject tagging of pictorial works, there are other specialists such as Svenonius (1994) who believe that it is almost impossible to express what is symbolized in one medium in to another. In other words, visual and/or pictorial works are hard to be fully indexed by means of verbal language. The dilemma is only solved (at least to some extent) if both subject indexing knowledge and a bit of visual/verbal symbolism

knowledge are mixed together. Here rises another point regarding the subject matter in works of art based on Panofsky's theory in iconography; since iconography as a branch of art history deals with the subject matter or meaning of works of art. Panofsky (1962) identifies 3 different strata for subject meaning of pictorial works: 1) The Primary subject matter which is identified through pre-iconographical description. In order to develop such a description practical experience (i.e. familiarity with objects and events) is required. Identifying lines, colors, basic shapes, objects and etc. takes place at this level (Peters & Stock, 2006). 2) The secondary or iconographic subject matter which is identified through iconographical analysis. This type of analysis requires knowledge of literary sources (i.e. familiarity with specific themes and concepts). Events, Personas, specific objects and concepts are to be identified at this level. It is here that the interpreter is able to explain what is really going on in an image. If the image's icons are correctly identified then its true story is revealed. 3) The intrinsic meaning of the image (Iconology) which is identified through iconographical interpretation in a deeper sense (i.e. Iconographical synthesis). Developing such an interpretation requires synthetic intuition which is familiarity with essential tendencies of human mind and it is conditioned by personal psychology and "weltanschauung"[3]. At this level things which have been inferred from image are not necessary depicted in it.

Arriving to the goal of intrinsic meaning of an image requires correct pre-iconographical description and then correct iconographical analysis. The first phase is simple. It deals with lines, colors, basic shapes and as long as we have the practical experience of encountering the motifs, we would certainly be able to distinguish them. Yet Iconographical analysis phase focuses on the stories and themes (Sieger, 2010). It requires the capability to drive right conclusions regarding the aboutness of an image in primary level; The stage when one can name the icons and say what is really happening in the work of art. Yet interpretation of the intrinsic meaning of an image is based mainly on the symbolic interpretation, and requires the knowledge and ability to make sense of what has been expressed behind those depicted. This skill is equal to the capability in inferring the aboutness of the image in a more elaborate level. Fujita (2000) in a paper describes this aboutness at primary level and elaborates level as the

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[3] . World-View

foreground image where main motifs are placed and background images where clues are hidden in order to give implicit information in the picture.

**Methodology**

For this purpose of the study a qualitative approach has been used. 25 in-depth semi-structured interviews (each session took at least 30 minutes) were conducted in two phases. In qualitative researches the sample size is determined by data saturation which means new categories, themes or explanations stop emerging (Marshal, 1996). As for this study, after the 20th session there was no sign of new keywords or even interpretations (right or wrong) from the interviewees. Thus the interview sessions were stopped at the number 25th.

In the first phase a collection of 10 widely-known news images were given to each interviewee and they were asked to assign subject tags (as many as they wish) to each. The images depicted 10 famous events or situations in Iran (5 pictures) and the world's history (5 pictures). If the user by chance was not familiar with the theme or the true story of the image, some facts regarding each image were given to him/her for further tagging (again as many as they wish) or even modify their previous tags. Since these images were selected from award-winning or well-known news images, and since the audiences of news images were ordinary people, the interview sessions were settled in a park where the researcher could find ordinary people with different backgrounds. Azadi Park (as the largest park - 200 km$^2$) in Shiraz city (Iran) was selected as the setting for the data gathering sessions. The interviews were recorded and the tags were also written down on the two part form designed for writing down the tags and descriptions made by the interviewees during the first and second phases of the interview.

Analyzing the interviewees' responses, the tags were divided into those which represented the ofness and those which represented the aboutness concepts and then basic features of Panofsky's Theory of Three Strata of Subject Matter which have been previously enumerated in a short checklist were mapped on both groups of interviewees' tags (those reflecting ofness and those reflecting aboutness).

**Findings**

*Aboutness tags vs. ofness tags*

The results show that the interviewees focus both on ofness and aboutness of an image in subject tagging; but it seems that about two-third of their subject tags are assumed to reflect the aboutness of each image. For instance regarding fig. 1, for every single tag focusing on ofness, 2.2 tags regarding aboutness of the image was assigned. Popular ofness tags assigned to this image were "Two Hands", "Black hand", "Africans", and "Ugandan Child". Popular wrong ofness tags were "Somalies", "Somali child", "Somalia". Although these tags share some semantics and symbolic icons with the main idea of the image, wrong tags here best denote the important effect of familiarity with themes based on the literary (i.e. recorded) knowledge in Panofsky's theory. Recently Iranians have been bombarded by myriads of news about the drastic situation of Somali people. Thus first impression of some of them was that this picture is actually depicting a Somali child. Next, when the real date and theme of the image was revealed to them, they just kept correcting their previous tags regarding the time and also the place. In other words, after explaining the theme or story of each image, most of the interviewees began to correct their iconographical impression. Yet their tags of aboutness remained mostly unchanged.

**Figure 1. Uganda, 1980, A Starving Boy and a missionary**

A deeper speculation of the interviewees remarks on images, reveal this interesting point that although inferring aboutness at the level of iconological interpretation is almost impossible without correct iconographical inference of works of art, in case of news images it is possible to infer just the right aboutness even at the highest level in Panofskys' three strata without knowing the true story of the image (i.e. when the icons in the image are not known). In other words based on table 1, it is possible to have pre-iconographical tags and then jump to iconological tags. One of the interviewees regarding fig.1 mentioned five tags "Thin, wrinkled black hand" and "white hand", "Famine", "Capitalism" and "Need for international help". To assign these last two tags to the image is a matter of the indexing database policy, but from the

users point of view they are not wrong[4]; and there might be somebody in search of a news image similar to this for fund raising reasons.

*The effect of demographic variables in tagging*

During the data gathering sessions the researcher tried to balance the distribution of demographic characteristics of the interviewees. 13 female and 12 male interviewees took part in the study. Their ages ranged between 16and 76. Based on the interviews, no evidence regarding any particular difference between male and female participants was found. But as for the age, some delicate differences were perceived[5]. Those who were 30 or older acted better in iconographical level, both for tagging the ofness and especially aboutness. Scrutinizing their characteristics revealed more. Those who were more disposed to different types of mass-media were better in iconographical interpretation, yet those who were younger and used internet frequently were more familiar with the concept of tagging and thus they were more choosey. It seems iconographical interpretation in news images requires more general information. In case of fig.2, there were few participants who failed to recognize Mosaddeq[6]. In such cases their guess regarding ofness was "Thinking man", partially correct guess on aboutness was "thinking", wrong impression on aboutness at the iconological level was "Age" and the worst tag on ofness was "Monk".

**Figure 2. Mohammad Mosaddeq 62nd Prime-minister of Iran**

General information plays a vital role here since different interviewees with different age from 19 to 76, who recognized the icon depicted, were in different educational levels, and yet the one who made the worst choices was a Chemistry student. Thus one can infer it is wrong to have total confidence in users tagging, unless you gave them a clue, maybe a caption or a short summary for the image; and there must be some sort of regular checking.

*Gradual Interpretation*

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[4] . Here "famine" is regarded as a tag regarding iconographical aboutness of image.

[5]. The best preliminary interpretation on ofness was given by a small kid (~6) who was playing in the park while I interviewed her mother. She came, saw the picture and said: "this is a small black hand with red sleeve in a white hand". None of the interviewees mentioned the depictions in such details, but anyhow she was not assumed as a participant.

[6] . Well-known Iranian Poli cian (18821967).

Based on analyzing the tags provided for each image by interviewees, a matrix was prepared showing the confluence of aboutness and ofness tags as columns and Panofsky's three strata for each image. Based on the interviews the discerning sequence, through which each group of keywords is provided, could be developed. Table 1 depicts a merged matrix with the discerning sequence for each group of keywords.

**Table 1. Mapping matrix for Panofsky's theory and Ofness/Aboutness description**
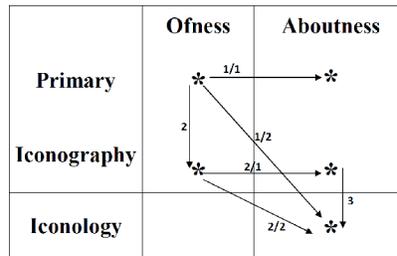


For a better understanding, the results for fig. 3 are discussed here. This image depicts a demonstrator confronts a line of People's Liberation Army tanks in china (1989 - Tiananmen Square)[7].

**Figure 3. 1989- Tiananmen Square Demonstrations**

During the interviews it was observed that at the first sight there is a tendency to tag based on objective impression. (For instance: "Tanks", "People", "street", "A man in front of tanks", "Army", "Tanks in the city"). At this stage only the objects depicted directly in the image is mentioned. Gradually those who were not familiar with the theme of image, expanded their description to tags such as "Military Parade", "war", "Civil war", "Invasion to country", "demonstration" at first and then to more symbolic terms such as "Resistance", "Sacrifice", "Life vs. death", "Faith", "Freedom", "Hegemony", "Forced to fight", and "capitalism[8]". As it is evident in these three groups of tags, two types of aboutness are to be inferred. The tags regarding ofness at this stage are well-classified under preliminary interpretation of ofness. Those aboutness tags inferred from the objects including terms such as military, war, or

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[7] . 1st prize world press photo, by Charlie Cole.

[8] . This is due to wrong preliminary interpretation of ofness. The interviewee failed to see the red stars on Tanks. It is important to note that the interviewees were ordinary people who might not have proper reading rate or enough general information.

demonstrations could be classified under preliminary/ pre-iconographical interpretation of aboutness. But the latter group of aboutness tags is symbolic enough to be classified under iconological interpretation of aboutness. Wrong interpretation of aboutness at this level is inevitable as it is evident in both groups of aboutness tags.

The next stage is the iconographical interpretation of aboutness. Some reached this level (4 persons) but others asked the interviewer to tell them the image's theme. Among those four who guessed the theme 2 were right. One of them exactly mentioned Tiananmen and the other person mentioned China, and both of them enhanced their tags with the date in the second phase of the interview. Those who gave wrong tags mentioned "American tanks" and "Israeli tanks". At this level the correct icons are identified. And only based on a correct iconography, a correct aboutness in iconographical and iconological levels is reached. At this level ofness tags such as "Chinese demonstrator", "Tank-man", and "Chinese army tanks" are provided. Iconographical aboutness tags such as "Tiananmen demonstrations", "Tiananmen square demonstration", and "1989 China" were provided afterwards and totally wrong tags in iconological aboutness level mentioned prior to the correct iconological notion of the image such as "capitalism" changes to "Communism". In table 1 the whole sequence of interpretation is shown through numbered arrows. To sum up, we infer that one can interpret objects in a picture and infer the aboutness of it. At this stage if the observer develops a false impression from what has been depicted, false aboutness is inevitable. According to Panofsky it is hardly possible for a person to base a correct iconological impression on a pre-iconographical inference. This study shows that at least regarding the news images this doesn't always hold true, since from the primary stage one can infer to some extent the iconological aboutness of the image (table 1). On the other hand, as soon as the interviewees were able to distinguish the iconographical ofness of the images, they could speak about iconographical and iconological aboutness.

*Which group of tags to prefer?*

Another important question which remains is the significance of each group of keywords for a better retrieval. Each group of tags was searched in "Google Image" and the results showed that by utilizing those tags which deal with ofness and aboutness at the Iconographical level of description, the desired image is returned within the first page of the retrieval. Further

investigations revealed that those tags regarding pre-iconographical interpretation of ofness and aboutness are weak in retrieving the image within the first page of retrieval (for 50% of images the results appeared in the $3^{rd}$ or up). As for those symbolic tags the search results were hopeless. But the interviews showed that the number of people who exactly know the theme of the picture and thus those who could correctly interpret the iconography of image elements are not large. Also due to the fact that people are not eager to give tags regarding ofness, it would be a reasonable decision to assign some elemental primary-level tags regarding the ofness to each image. Based on the tags that interviewees assigned, it is evident that aboutness tags at iconological level could be sufficiently provided by users; but since personal judgment highly affects the decision regarding the keywords at this stage and because these tags are not successful in providing precision, it is better to keep these groups of tags as small as possible. This means that a subject indexer is needed to assign/add necessary tags regarding iconographical ofness and aboutness and keep the amount of tags regarding iconological aboutness small, since users are weak in this regard. During this process, special favor should be given to those tags which are classified under iconographical offness.

**Concluding Remarks**

Subject indexing of images is becoming of greater significance in today's knowledge representation as people show more interest in image objects on the Internet and in databases. One of the most important points to make is that, based on the findings of this study, news images' interpretation is to some extent different from the works of art. Whether this difference is because their simpler or less symbolic nature or due to the subjects depicted in them, different audiences with different backgrounds do understand (at least to some extent) them, and their meanings could be conveyed. The whole process of absorbing the deepest symbolic meaning of each image is gradual. During different phases of this process different notions of ofness and aboutness are perceived. On the other hand, general information/knowledge plays an important role during meaning interpretation of an image. More general knowledge leads to better iconographical interpretation. This means that knowledgeable people, who have access to information media/sources, assign better iconographical tags regarding ofness and aboutness;

and this helps them in developing more precise iconological aboutness. Also it seems that iconographical tags on both ofness and aboutness retrieve better results. But based on the findings of this study, users are not always familiar with icons in an image. The role of subject indexer or in some systems the image provider (the one who uploads the image) would be of great help through providing iconographical ofness/ aboutness tags, or providing a short summary and/or a caption for the image.

This paper opens an insight into classifying subject tags for images based on two well-known approaches of Panofsky's theory and Aboutness/Ofness description of images. Further research can be carried out to find out the process of interpretation of images by people and the factors that may affect this process. Also we need to find out about those tags assigned by people that are not relevant to the images but represent subjects they think suitable.

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