

Modes of Address in Pictorial Art: An Eye Movement Study of Manet's *Bar at the Folies-Bergère*

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In the 1860s, the French painter Edouard Manet repeatedly excited controversy with works that challenged the existing orthodoxies of painterly treatment and composition. He brought about radical changes to pictorial address and to the perceived relationship between picture and spectator. These developments have been the subject of considerable art-historical study and continue to influence ideas concerning address and spectatorship in current art practice. Manet's innovation was to introduce to the spectator's experience not only the subject of the scene depicted but also the subject of the act of viewing itself. Thus the spectator can become conscious of his or her presence and role in the system of the painting's address. We focus here on specific art-theoretical accounts of "anti-theatrical" address and use Manet's painting *A Bar at the Folies-Bergère* (Color Plate B No. 1) as a key example in which both "absorptive" and "acknowledging" modes of address are thought to be employed to establish this conscious engagement. The mode of address of this painting has been described as a "double relation" to the spectator [1] and Manet's deliberately equivocal positioning of the viewer as producing a "space of *relation*," in which viewers become conscious of their "presence within a much larger system" [2]. Our objective was to seek actual behavioral evidence of active engagement with *A Bar at the Folies-Bergère* in the manner proposed by these accounts.

The artistic context for our study was initially theorized in 18th-century France, by art historian and critic Denis Diderot. Diderot's *Salon* texts were the first to introduce the idea of the relationship between painting and beholder [3], further developed in recent years by Michael Fried [1,4–5]. Diderot and Fried promote the idea of some pictures being

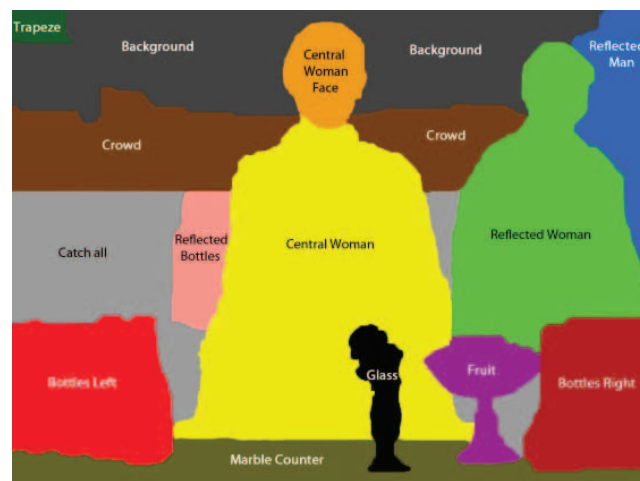
"anti-theatrical" (which Fried also terms "absorptive"), by which they mean the pictures are constructed without any acknowledgment of the presence of an audience; the figures within the picture belong to a world of their own. Absorptive pictures allow active engagement by spectators with people, objects and events, while in contrast "theatrical" pictures openly declare themselves to an anticipated audience, closing off the type of full engagement with the scene enabled by absorptive pictures by rendering spectators passive.

In Fried's interpretation of Diderot, achieving an anti-theatrical mode of address depended upon the ability of the painter to successfully devise ways of *neutralizing* the fact that paintings are made to be beheld. In the 18th century, anti-theatrical address was mainly achieved through the depiction of figures absorbed in their own actions/feelings/thoughts. If this complete absorption was not convincing and the figures seemed to be seeking only to *appear* so engaged in order to make a particular impression on the audience, the work was considered theatrical.

ABSTRACT

Art-historical accounts of the last 200 years identify developments in the types, or "modes," of address that a picture can present to a viewer as critical to the experience and evaluation of paintings. The authors focus on "anti-theatrical" theories of pictorial address and the complex and innovative "double relation" of absorption and acknowledgment introduced by the painter Edouard Manet. They report a case study of Manet's *A Bar at the Folies-Bergère* investigating expert and novice spectators' eye movements and utterances in response to the painting to find evidence that viewers seek resolution of the complex "double relation" that the theories describe.

Fig. 1. The regions of interest selected for eye movement analyses.
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Tracing the development of this increasingly challenging issue for painters into the 19th century, Fried shows that various solutions were sought, including depicting figures with their backs to the spectator to remove the possibility that they might “see” the spectator, for example in paintings by Gustave Courbet and Jean-Baptiste-Siméon Chardin. Another approach was the “quasi-corporeal merger” of the painter (also the *first* spectator) with the scene, through an implied physical “merging” of spectator with scene, which Courbet suggests by placing himself in the scene via a self-portrait, thus (as *first spectator*) removing the spectator from in front of the picture by incorporating him into it [6].

In the *Bar*, Manet’s solution was radical. Rather than turning the address of the painting *away* from the spectator, the scene appears initially to be directed *at* us and as such should be theatrical. However, the complex interplay of acknowledgment and absorption creates a dynamic, anti-theatrical address that “effectively leaves the beholder altogether uncertain as to his or her relation to the painted scene” [7]. Fried notes here that “the *Bar*, Manet’s valedictory masterpiece, develops that uncertainty with unmatched lucidity” [8].

Manet’s painting presents a barmaid at a bar; her reflection is shown in a mirror behind her. At first glance the image looks “right.” It is only after closer inspection that aspects of the painting present ambiguities of address to the spectator. We provide two examples. First, the initial sense of being looked at by the barmaid is mistaken, as, on closer inspection, we find she looks to the left and beyond us. Secondly, the trigonometric inconsistencies in the depiction of the mirror’s reflection produce ambiguity: For example, the man in the top hat both “is” and “is not” positioned in front of the barmaid. If the reflection is veridical, he

is in front of the barmaid if we stand further to the right of the picture to render the geometry correct, but if we stand in the usual viewing position (in front of the picture) either we, as spectator, become the reflected customer or we usurp his place. We focus on these two aspects of the painting in our analyses.

The question of how spectators actually view the *Bar* has been explored previously only through art-theoretical accounts. It is, however, possible to consider these accounts in terms of predictions about actual spectatorship, and this forms the basis of the present paper. When spectators view scenes (whether real, photographic or painted), the visual system builds up a representation in a common manner, establishing a gist within the first 100 ms or so. This gist provides a rough articulation of pictorial, structural and semantic properties of scenes [9] and is followed by more detailed visual sampling accomplished through eye movements [10,11], where key objects and their spatial and semantic relationships are established. Might it be that evidence for types of modes of address can be found in the patterns of eye movement made when exploring paintings?

In the *Bar*, there is a tension between coherence of the gist and the fundamental failure to coherently integrate the primary objects of the image within the gist. This interplay between gist and detail is plainly intentional. There is evidence, in the form of two sketches and a painted study that Manet made in preparation for the *Bar*, that he developed the scene from one sketch in particular, in which the mirror reflection is geometrically accurate and straightforward, to the final version, in which the reflection’s inconsistencies result in what Fried describes as the complex “double relation to the beholder” [12]. As Collins notes, the sketches show that Manet’s thinking on

the subject of the work radically changed through a reinvention of the device of the mirror commonly used in 19th-century French painting simply to show the figure in full: “The mirror, which had been used to reveal her more fully, is now a device for revealing the spectator” [13].

Our study explores a simple issue: Do spectators respond to the “double relation” set up through (1) the barmaid facing the spectator while her gaze is averted and (2) the configuration of the spectator in relation to the central barmaid and the figures reflected in the mirror? Using general eye fixation patterns and utterances to indicate cognitive processing while viewing the painting, we seek evidence for engagement with and efforts to resolve this double relation. The alternative is that no double relation is detected, and consequently, no attempt at resolution is made.

We place special emphasis on the triad of figures: the central woman, the woman’s reflection in the mirror and the reflection of the man who is engaging with her. If shifts between an absorptive mode of address and an acknowledging mode occur, then a number of inferences must be made by spectators: that there is a mirror behind the bar, that the figures to the right of the woman are reflections, and that the man would actually be standing in front of the woman, in the position occupied by the spectator. Such cognitive processing should be evidenced by scan paths that reflect the relationship between these key regions and is likely to be accompanied by utterances concerning the spatial relationship between the woman and the man, the man’s reflection and the suggestion that he is in a position consistent with that of the spectator. We also suggest that the woman’s very central position means she will be particularly important, attracting many fixations since viewers tend to fixate the central portion of an image [14]. The

Table 1. Descriptive statistics for novices and experts under free viewing and inclusion/exclusion task instructions. Parentheses indicate standard errors. The mean total trial duration, mean gaze duration (time from first fixation on a region until a fixation on a different region), proportion of the trial spent speaking and the mean number of words spoken are reported.

Viewing condition	Experience	Mean trial duration (s)	Mean gaze duration (ms)	Mean proportion of trial spent speaking (%)	Mean number of words spoken
free-view	novice	104.0 (11.0)	782 (60.0)	82.6 (3.8)	197 (36.4)
	expert	118.0 (24.2)	797 (55.2)	82.2 (4.5)	185 (56.8)
include/exclude	novice	56.8 (17.1)	691 (82.5)	74.6 (2.1)	107 (33.9)
	expert	131.7 (17.0)	807 (63.7)	91.1 (4.0)	306 (41.1)

woman's stance is such that she is facing the spectator, yet her gaze is averted, a social signal of disengagement. Her posture presents the spectator with an acknowledging mode of address, while her averted gaze presents an absorptive mode.

Two versions of our hypothesis—that seeking to resolve the “double relation” will be evident in behavioral data—are possible. Potentially, the *Bar* affords the “double relation” [15]. Here we use Gibson's term *afford* to refer to the idea that an object has characteristics that permit us to engage with it in a particular way. In this sense, the painting evokes uncertainty through its mode of address, and evidence for the double relation may be found in the eye movements and utterances of spectators. However, if specific knowledge of art theory is required in order to perceive the double relation, then only participants with knowledge of mechanisms of pictorial address will reveal behavioral evidence of the double relation. To provide insight into this question, half of our participants were novices and half were experts.

METHOD

There were four male participants and four female, aged between 34 and 72 (mean age = 46.8 years). Four participants were established artists or art historians, classed as “experts” and knowledgeable about mechanisms of address associated with this and other paintings. Four were classed as “novices”; each of these had seen the picture previously but had no prior training in art spectatorship nor any knowledge of relevant critical theory.

Eye movement data were recorded using an eye-tracker consisting of a *scene* camera and an *eye* camera, mounted on a set of goggles and stored on a laptop computer. The scene camera recorded the immediate visual environment the participant was facing; the eye camera recorded the pupil and first-surface corneal reflection from the eye, illuminated by a small infrared LED. Software synchronizing the two video streams determined where a participant was fixating on a frame-by-frame basis. Participants' utterances were recorded and synchronized with their video streams.

Participants each took part in a single testing session lasting 20 minutes, including calibration. They viewed the painting and verbalized their thoughts under three different task instructions: a *free viewing* phase, in which participants were asked to “look at and talk about the painting”; an *inclusion/exclusion* phase, in

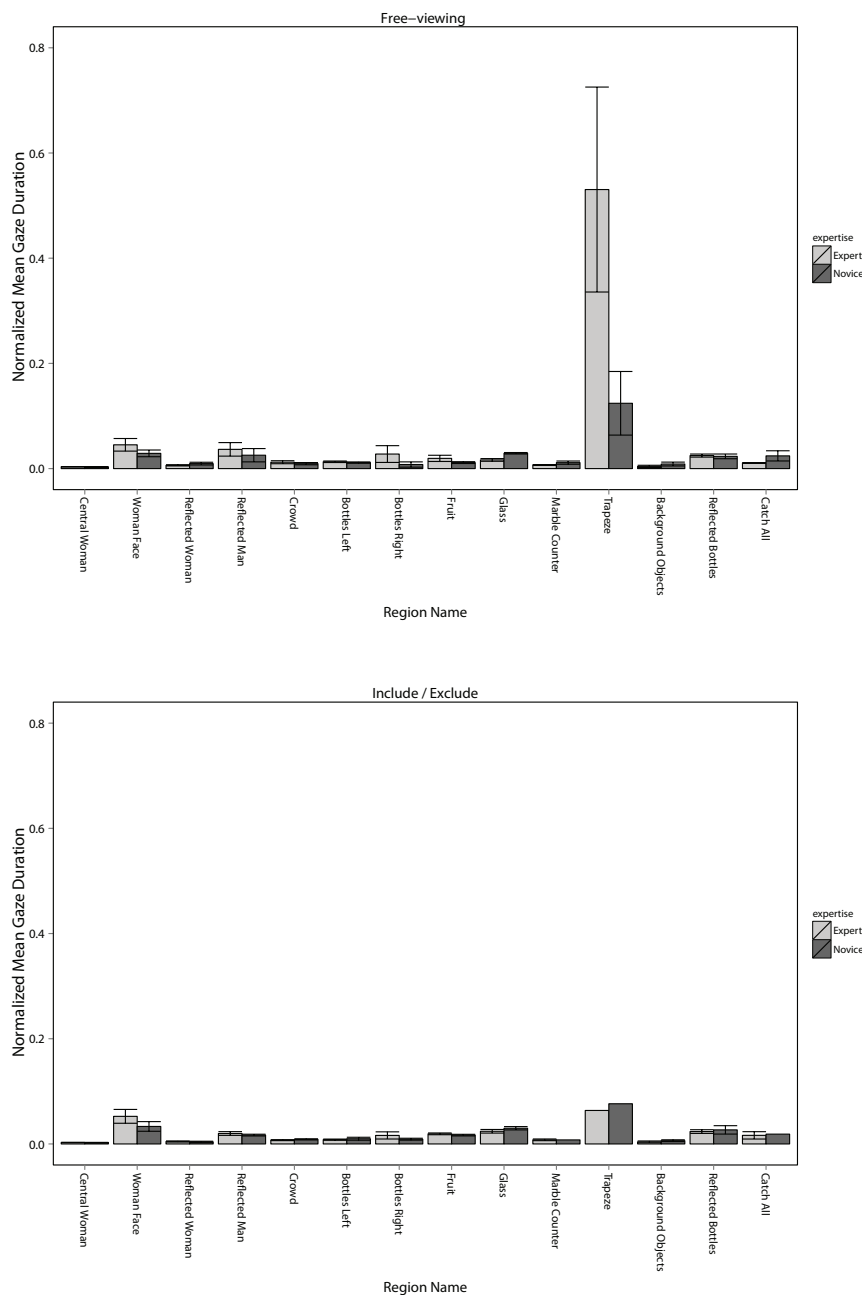


Fig. 2. (a) Mean gaze duration for all regions in the Free-Viewing condition and (b) the Include/Exclude condition normalized by number of pixels in each region. Error bars indicate standard errors. (© Beth Harland)

which they were asked “to what extent does the painting seem to include you or exclude you?”; and an *elemental inclusion/exclusion* phase, in which they were asked, “What are the elements of the painting that cause you to feel included or excluded?” We only consider the first two phases here, since responses in the third were brief or repetitive of previous responses.

The painting was viewed *in situ* at the Courtauld Gallery, London, during hours of closure. Use of the actual painting, allied with the extensive datasets of each individual—on average between

855 and 1980 fixations per participant per condition—contributed to the consistency of the data (despite the small participant sample size).

RESULTS

On average, novices spent less time in both test phases (see Table 1). However, during free viewing, the utterances of experts and novices contained a similar number of words, whereas when asked about inclusion/exclusion, experts became more loquacious and novices became less engaged. A similar pattern

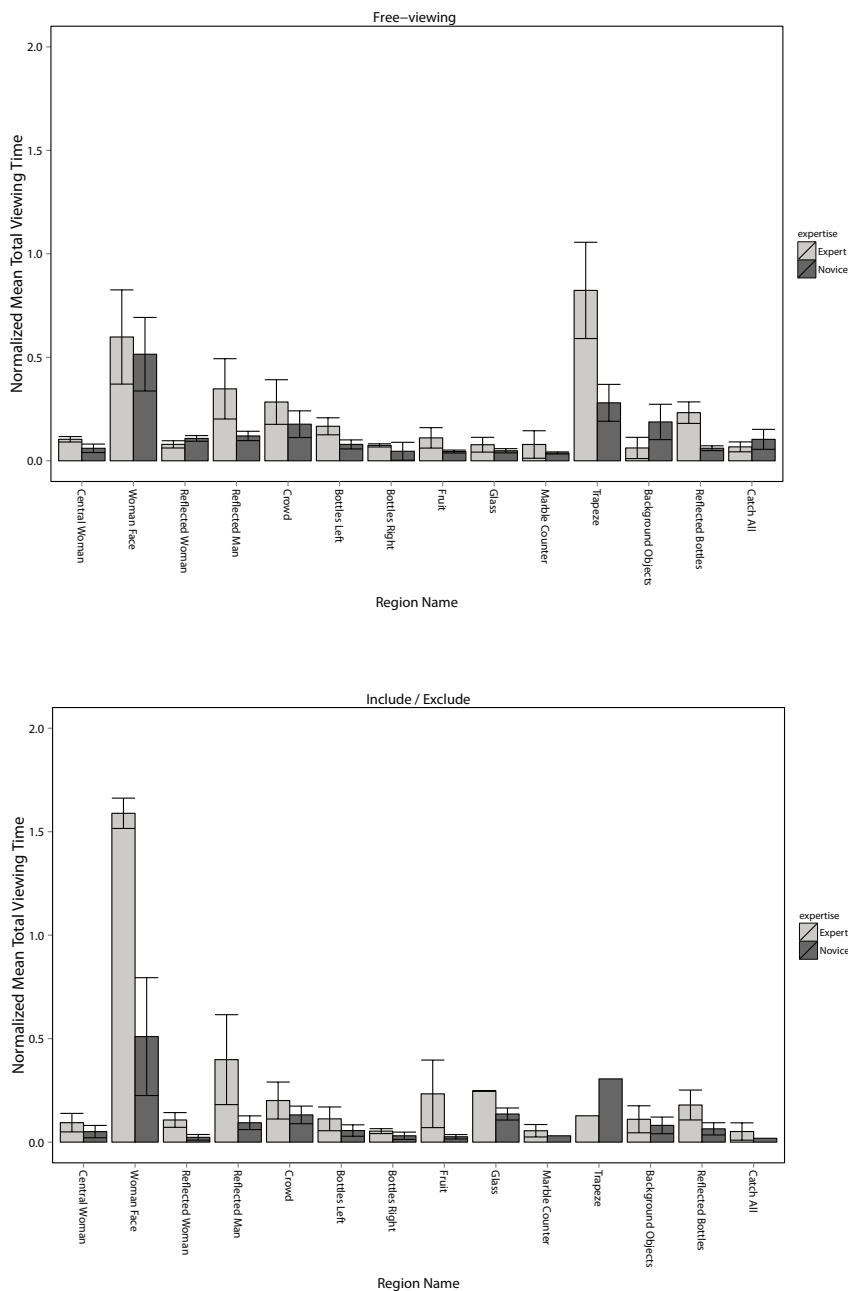


Fig. 3. (a) Mean total viewing time for all regions in the Free-Viewing condition and (b) the Include/Exclude condition normalized by number of pixels in each region. Error bars indicate standard errors. (© Beth Harland)

of engagement was also evident in the reduced gaze durations of the inclusion/exclusion test phase.

Coding of Data and Regions of Interest

The eye movement data and concurrent speech were coded on a frame-by-frame basis for each region of interest (Fig. 1). For the central figure, head and body were identified as separate regions, enabling us to measure spectators' attention to the face, because her gaze is pertinent to the theoretical discussion.

For both test phases, we computed three viewing measures by summing the

number of video frames (each 66.7 ms in duration) during which fixation was maintained on different regions of the picture: **gaze duration**—the time from the first fixation on a region until a fixation on a different region; **total viewing time**—the overall time spent fixating a region; and the **number of visits** to a region—the number of times participants returned to fixate a region again. These data provide a measure of (a) how long a region held a participant's gaze during initial inspection, (b) the total time spent processing a region and (c) the extent to which spectators reinspected regions of the painting (Figs 2–4). To ensure data

across regions were directly comparable, we normalized inspection measures by the surface areas of each region, so that objects receiving more visits or longer processing times do so because of their importance rather than because of size. We were interested in finding the measures on which experts differed from novices and used differences between means (averages) to establish this. Due to the limited number of participants, it is not possible to use inferential statistics to test for differences. Rather, we report the measures where the means from the expert group are highly likely to be different from that of the novices (formally we define this as the absence of overlap between the standard errors surrounding each mean). We make no comparisons where no standard errors exist due to there being data from a single participant.

Initial Gaze Duration Analyses

Free viewing: The most striking aspect of the gaze duration data is the extended periods spent viewing the trapeze artist shown in part in the upper left corner of the painting: When participants initially fixated this region, it held them for substantially longer than any other region. This was particularly noticeable among the experts. This result may reflect two aspects of processing. First, a trapeze artist is semantically incongruous with the bar scene depicted. Several studies investigating scene perception have shown that objects that are semantically incongruous receive increased viewing durations [16]. Second, the extended gaze durations of the experts could possibly reflect their awareness of the historical significance in the painting of the truncated figure (linked to the impact of photography, which was of interest to Manet, or to the idea that fragmentation of the body might signal the transitory nature of modern experience).

Inclusion/exclusion: Extended initial viewing periods occurred for the trapeze artist and the woman's face. However, the experts did not spend more time initially viewing the trapeze artist than the novices did. In fact, while following our inclusion/exclusion instructions, the experts did not maintain their extended initial engagement with the trapeze artist.

Total Viewing Time Analyses

Free viewing: The experts fixated the trapeze artist more than any other region. In addition, for both the experts and the novices, the central woman's face attracted quite a number of fixations. The experts spent more time processing the

central woman, the reflected man, the bottles on the left of the painting, the fruit and the trapeze artist than did novices.

Inclusion/exclusion: Both novices and experts spent most of their time fixating the central woman's face. Experts spent more time than novices fixating the woman's face, the reflected woman, the reflected man, the fruit and the reflected bottles.

Total Number of Visit Analyses

Free viewing: Experts and novices made repeated visits to the woman's face, and experts made more visits than novices to the bottles on the left, the glass and the reflected bottles. There is some evidence

that novices examined the background objects more than experts did.

Inclusion/exclusion: Experts made more visits than novices to the woman's face, the reflected man and the reflected woman, and to the bottles on the left, the fruit and the glass. These data indicate that the long total fixation times on the woman, her reflection and that of the man arose not because the experts spent a small number of extended periods transfixed on each region but rather because they made numerous saccades between each, suggesting that they were evaluating each figure in relation to the other, and, arguably, the relationship

that exists between them. There was less evidence of comparable processing in the novice participants. We suggest that the increased visits to the objects on the bar, the bottles, the fruit and the glass made by experts relative to novices occurred because these objects encourage interaction through the realism of their depiction and their appeal to senses other than vision. As this is not the focus of the present study, these data will not be considered further.

Scan Path Analyses across the Central Triad of Figures

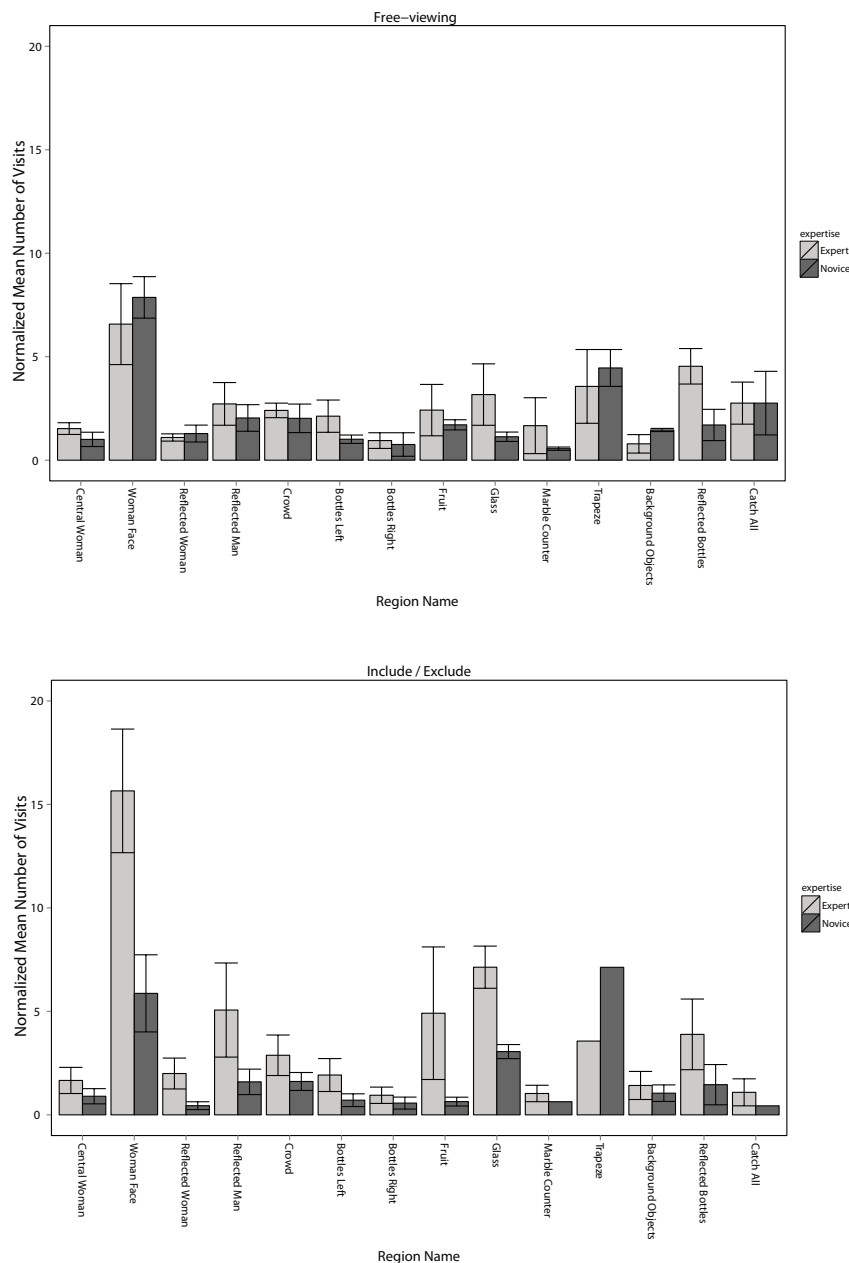
The eye movement analyses suggested that the trapeze artist does initially hold the attention of both expert and novice participants. However, consideration of inclusion and exclusion led experts to fixate the woman's face, the reflected man and the reflected woman and to inspect other objects. In stark contrast, novices considered the woman's face but not the reflected figures, in addition to maintaining some attention on the trapeze artist. We interpret these data as showing that only those with expertise in pictorial address are sensitive to the "double relation" of the central triad. However, these data are only suggestive of this and would benefit from further supporting evidence linking eye movement data to utterances.

First, we established that there was a close relationship between what participants talked about and what they looked at. To establish this relationship, we identified an average of 8 key words in the transcription of each participant that corresponded directly to particular regions of the painting. We anticipated that fixations on objects about which participants spoke should occur within a short time period. Consistent with this, we found that on average participants spoke about a region 910 ms after fixating it, showing a good deal of synchrony between patterns of inspection and utterances.

We then identified segments of the utterances in which participants explained their sense of inclusion and exclusion and examined their patterns of eye movements across regions in relation to the precise content of their speech. We were able to directly relate specific patterns of eye movements to utterances describing specific aspects of the painting. Transcriptions of a sample of the utterances, along with patterns of saccades over theoretically critical regions of the painting, are provided in Figs 5 and 6.

Both experts and novices noted that although the central woman was facing

Fig. 4. (a) Mean number of visits to each region in the Free-Viewing condition and (b) the Include/Exclude condition normalized by the number of pixels in each region and scaled up by a factor of 10^5 . Error bars indicate standard errors. (© Beth Harland)



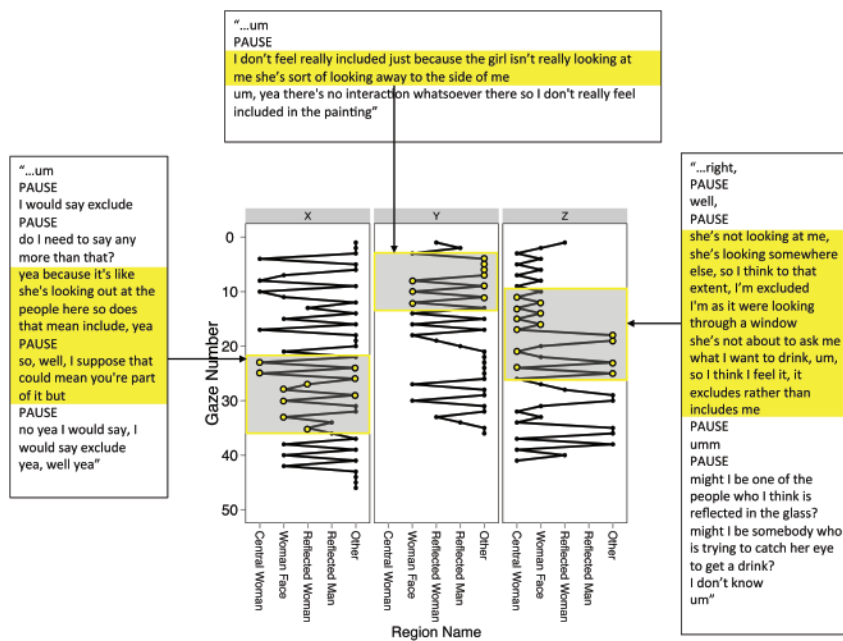


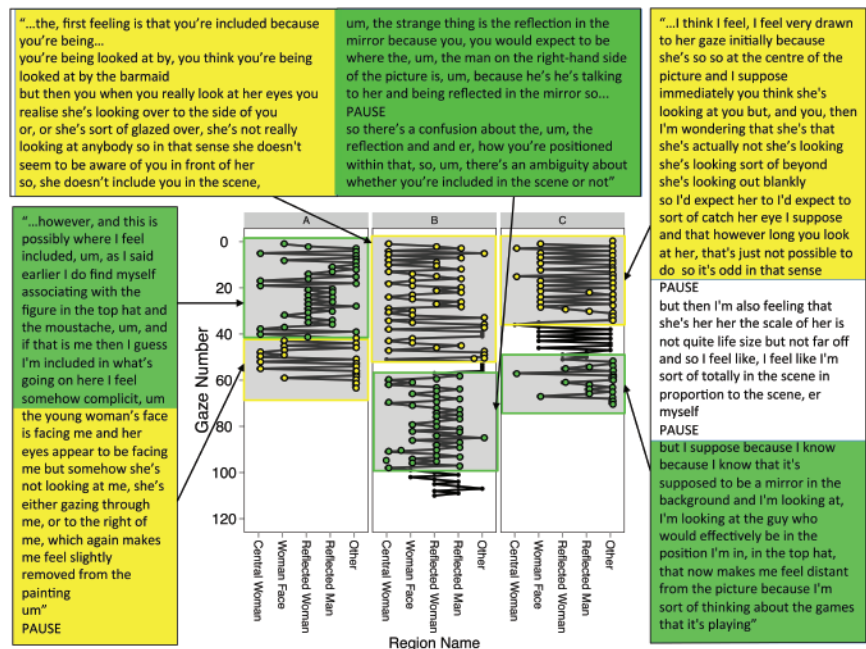
Fig. 5. Patterns of inspection over the central woman's body, the central woman's face, the central woman's reflection and the reflected man, as well as over all remaining regions (grouped as "other") during novices' utterances pertaining to these regions. Note: Gaze Number scale extends from 0–50. Error bars indicate standard errors. (© Beth Harland)

them, she was not actually looking directly at them. All our participants, regardless of level of expertise, indicated that this made them feel excluded from the picture. Figures 5 and 6 show that each participant, when speaking about this aspect of the picture, spent time fixating the central woman's face (utterances and corresponding eye movements are highlighted with light shading [yellow in the color versions]). The next aspect of these analyses is that all the experts mentioned the man and explicitly commented that he is reflected in the mirror (see Fig. 6). Notably, each considered his position in relation to that of the central woman, her reflection and him- or herself as a spectator (utterances and corresponding eye movements are highlighted with darker shading [green in the color version]). The patterns of eye movements during this period show that the experts made a series of successive saccades to fixate the woman's face as well as the reflections of the woman and the man in the mirror. The pattern of eye movements supports the view that the experts engaged in consideration of the spatial relationship between the central figure and the reflections in a manner consistent with the modes of address theorization we have identified. Contrastingly, Fig. 5 shows that the novices displayed little by way of similar engagement with the painting, in terms of either the content of their utterances or of their eye movements. To support this, we conducted a Chi-Square analysis of the number of

fixations made on the woman's face and the woman's and man's reflections in the mirror compared with fixations made on other areas of the painting by the experts and novices. This showed that, compared with novices, experts made significantly more fixations on the regions associated with modes of address theorization compared with other regions of the painting ($X^2(1, N = 6) = 7.70, p < .01$).

Indeed, close scrutiny of the entirety of

Fig. 6. Patterns of inspection over the central woman's body, face, woman's reflection and reflected man, as well as over all remaining regions (grouped as "other") during experts' utterances pertaining to these regions. Note: Gaze Number scale extends from 0–120. Error bars indicate standard errors. (© Beth Harland)



each transcription from the novices provided no evidence that they interpreted the two figures in the background as reflections in a mirror. Rather, it appears that they considered them to be two separate individuals entirely independent of the central woman. Importantly, we are not claiming that the novices never fixated the figures in the mirror. As we showed in the total viewing time data, both novices and experts spent time fixating the reflected man and the reflected woman (as well as the central woman). However, none of the novices engaged in scanning behavior that suggested consideration of the spatial relationship between these figures. Furthermore, and critically, none of the novices spoke about the people in the mirror as being reflections and thus showed no appreciation of consequent implications for the position of the spectator relative to these figures. Thus, it appears that while the novices were able to detect aspects of the painting that were immediately indicative of disengagement, such as the averted gaze of the central woman, none of them made the higher-order inferences necessary to allow for consideration of their own positioning in relation to the reflected figures.

DISCUSSION

Our study explored whether there is evidence in behavioral data (eye movement and utterance data) that novice and expert spectators respond to the position

they are placed in by the “double relation” set up in Manet’s painting *A Bar at the Folies-Bergère*. The include/exclude condition is critical, where the data from novices and experts are clearly different. Here, experts processed the three main figures in the painting, while novices focused much more on the woman’s face. More importantly, the experts provided data in both the eye movement and utterance records consistent with seeking to resolve the relationship between the figures in the central triad and their own viewing position, whereas novices did not. Specifically, experts made numerous saccades between the figures of the triad; novices did not.

The simplest interpretation of the data is that resolving ambiguity detected in paintings requires making multiple fixations. In the case of the barmaid, novices and experts made multiple fixations, but for the figure triad, experts alone did so. However, the inclusion of utterances along with temporally synchronous eye movements allows us to say more. These data reveal that the ongoing cognitions during the resolution of ambiguity were couched in terms consistent with notions of absorption and acknowledgment in the theorization of pictorial modes of address. First, for both novices and experts, inclusion and exclusion were manifest in their responses to the central woman’s face. All participants noted that they felt included by the way the woman faced and addressed them. However, they all also noted that the woman was not looking directly at them and that this excluded them from the painting. These utterances were supported by the patterns of data for total viewing time and number of visits to the central woman’s face. Second, inclusion and exclusion were manifest in the responses of experts to the figure triad, while there was no appreciation on the part of the novices that the two figures on the far right of the painting were actually reflections.

The methodology we have used in the present study has allowed us to support the psychological reality of absorptive and acknowledging modes of address

in relation to this painting. It has also allowed insight into the process of the resolution of ambiguity over time and has done so at the level of the individual spectator. The conceptual, analytical and technical challenges required to provide this data in relation to this specific painting are, of course, the same as would be required for any other. As such, the current case study, while informative in its own terms, represents only the beginning of a fruitful line of investigation.

In summary, we provide data that suggests that key theories of modes of address in relation to this painting are rooted in a psychological reality, and that experts and novices alike were sensitive to overt aspects of the painting that cause them to fluctuate between the experience of inclusion and exclusion with the scene. However, only experts with formal training were able to make second-order inferences about relative spatial/temporal positioning to understand the implications of the painting’s shifting modes of address, the “double relation” of acknowledgment and absorption, and the implications of this for their own role as spectator more fully.

The fact that sensitivity to complex spatial and temporal relationships underpinning absorption and acknowledgment in art seems to be linked to expertise, whilst novices are insensitive to such complexity, is potentially very important. Visual expertise in face, animal and object perception is frequently apparent in the processing of configural relationships as well as individual features [17,18]. These visual configurations are merely articulations of spatial and temporal relationships across features. Given the role of sensitivity to configural relationships in understanding absorption and acknowledgment, the present paper may be the first to extend this general principle of visual expertise to spectatorship in art.

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