Emotional Connections with the Past: Exploring Engagement with Historical Images from an Online Museum Collection

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Abstract

There are many ways to help people make sense of the past but, to be effective, they must respect the perspectives of those concerned. Contemporary museums are attempting to facilitate encounters with the past by creating online as well as in-museum experiences for their visitors. Some museums see visitors as a potential source of information as well as people who might learn from the exhibits they create. As such, museums have a growing interest in gathering additional 'crowdsourced' historical information through the experiences they design. However, whether their encounters are with physical or digital artefacts, museum visitors bring with them the values and interests of the communities to which they belong and so crowdsourced experiences and reflections are likely to contrast these communities. Online and in-museum visitor experiences are different but could reflect an engagement with the past in complementary ways, depending both on how visitors make sense of them, and on how the traces of their visits persist and are curated.

We report two exploratory studies of sensemaking by museum visitors as they encountered a set of digital historical images in a military museum. Based on Dervin's approach to sensemaking, the images were accompanied by three neutral verbal prompts to encourage thinking about their individual meaning. The visitors' responses are used as a basis to explore how personal connections to historical material may impact the sensemaking process and foster meaningful and engaging experiences with online museum collections.

Our studies raise a number of questions about the relationship between the navigation of non-specialist community members through digital artefacts and the design of support for and the record of their journeys. We discuss the possible significance of emotional investment in historical material as a mechanism for engaging visitors with a more nuanced understanding of the past, via persistent traces of their visits. It may be that designing socially translucent traces could support engagement in a manner that bridges differences of understanding between the communities to which visitors belong.

1 Introduction

Many museums are taking steps to open their collections to the public online. The motivations for this are varied but raise new questions about how people make connections with the historical past. On the one hand, visitors are presented with forms of artefact other than the tangible content of a physical museum exhibition. On the other, the digitization of the past brings with it the potential to explore and see the connectedness of museum items that support new forms of sense making for visitors. The idea of a 'visitor', in this context, is similarly taking on a new significance to museums, beyond that of the paying observer, referring to depth and range of knowledge, interests and degrees of engagement with the past.

1.1 Human-Computer Interaction Design for Museums

Recent developments in digitisation and web publishing technologies have seen many museums make their collections available online. This digitisation has taken many forms; textual digitisation of the British Library's newspaper archive (King, 2005), photographic digitisation as demonstrated by the AAM's own project, or more advanced techniques such as 3D laser scanning of objects (Kuzminsky and Gardiner, 2012). Digitising collections serves the museum's traditional role in preservation and conservation of artefacts but also provides opportunities to fulfil modern roles such as educating and supporting the engagement and development of communities[1].

Some of the technical innovations serve to expose new dimensions of museum artefacts. The British Museum performed CT scanning to profile a 5,000 year old mummy. This not only a resource for academics and museum professionals to study but was also incorporated into a 'virtual autopsy' gallery interactive[2]. Visitors can make intersections through a 3D representation to explore the X-rays. All the data is available for visitors to explore in their own way within the framework of the system. The curator creates various signposts within the data that the visitor may stumble upon during their exploration. This demonstrates how the traditional role of curation can still exist in an open information space.

Advances in web technologies such as high speed internet connections and browser-based GPU accelerated graphics potentially allow for these types of engaging experiences to take place in the web browser. In addition to this there is also a strong element of connectedness that also follows on from digital innovation, extending beyond the preserved artefact to community interest groups. The web-based museum experience cannot be considered the equivalent to that of a visit to a physical museum: the context and focus of curated exhibitions can create an immersion in the past that is subject to a high degree of control. At the same time, online access to museum collections permits connection to other online resources and interest communities. Each mode of encounter can offer experiences that are very different, and intersect with the visitor's expectations and motivations in unique ways. Nevertheless, they represent potential engagement between visitors and museums and so it is valuable to consider where and how these encounters are similar.

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[1] NMDC, 'Values and Vision: The Contribution of Culture' (2006)

[2] http://www.britishmuseum.org/whats_on/past_exhibitions/2012/virtual_autopsy.aspx

The *spatiality* of a collaborative or communicative environment such as a museum can be considered a separate concept from its *sense of place* (Harrison and Dourish, 1996; Dourish, 2006). The physical space of the museum, the layout and geometric arrangements, allow for certain activities to occur. The constraints of a physical museum space has consequences for how artefacts can be displayed and therefore understood. A limited amount of space means that the curator is left to pick and choose the optimum way display their narrative. Web sites can also be said to have spatiality. The dimensions of a 2D virtual space of a website also provide limitations as to how information can be displayed and the ways in which visitor can move through it.

The *sense of place* refers to the meaning of social interactions that the space permits. People have expectations and prior knowledge of what museums are and what activities and behaviours are afforded by their place. Physical museums as places can be defined by their social meaning, cultural expectations and beliefs about the behavioural appropriateness of activities that can occur within them. People generally know how to act in a museum setting by virtue of prior cultural exposure to them. They expect to behave and interact with exhibits in a certain way. When people do not know how to behave in a given place, cues taken from the immediate environment can be used to inform this behaviour. For example, the type of furniture within a room can suggest the type of activity in which people are expected to engage in that place. Websites are also subject to this sense of place; operational affordances let visitors know how they can interact within the space; buttons, search boxes, filters; comment threads and message boards afford the voicing of opinion, instilling a permissive sense of sociality to a place. Indeed, the right to a voice on the past is a difficult matter in the context of curation and preservation. So the function of an online museum as an engaging, collective and conversational experience may not yet be expected by visitors in a manner that is coincident with the low expectation of having a voice in a physical museum.

Through an ethnographic study, anthropologist Genevieve Bell proposed the idea of *museum ecologies*. Within a museum's environment there are expectations, interactions, constraints and rituals that make up the museum experience (2002). Bell noted that different types of museum, such as Art museums and Science and Technology museums, can have different ecologies; the cultural understandings around each afford different interactions and visiting rituals. For example, there is an expectation that science museums allow for a more interactive experience; visitors to art museums expect the experience to be more reflective. However there are certain components that were found to be common across all museums:

Engagement People who visit museums expect to engage with the exhibits. This engagement is expected to be educational but also entertaining.

Sociality Since the majority of people visit museums in groups there is expectation that the experience will support social activities.

Liminality Museums offer an experience that is set apart from everyday life. Visitors are receptive to *transformative and moving experiences* and will actively pursue them.

These components do not exist independently from each other but may work together or constrain each other in some way. Therefore, the ecology metaphor

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may be appropriate; a system of interacting cultural expectations, behaviours and activities that make up the museum's sense of place. However. it is not clear how these components relate to a visitor's expectations of an online museum visit. More research is needed into visitors' encounters with digital artefacts to determine their expectations, motivations and the pertinent qualities of their engagement.

Villaespesa and Stack evaluated use of the Tate's website with a survey and found that the audience motivations were stratified (Villaespesa and Stack, 2015). They divided motivation into nine segments: personal interest research, student research, professional research, inspiration, enjoyment, arts news, repeat visit planning, first visit planning and organisational information. The vast majority of visits were to facilitate visit planning and research. However, the reported reasons for these visits may only reflect the current functional capabilities of websites and not their potential to support engaging, social and transformative experiences. If museum websites are not known to facilitate *experiences* visitors will not visit them for that provision.

Online museum collections today for the most part follow a familiar archive format. Digitised objects are searchable through keyword search or faceted filtering; the British Museum[3], Imperial War Museums[4] and Science Museum[5] are examples of this format. These online collections mostly consist of object document pages with a photo, categorical information and tags, and sometimes descriptive text. This makes a great resource for academics and enthusiast users but creates a difficult point of entry and fails to support the construction of a meaningful experience for those without the specialist knowledge to work with such categorizations. The objects in the collection are divorced from their contextual meaning if the viewer cannot provide it with prior knowledge, and the materials given by the curators are inadequate to support its construction.

1.2   Tools for Multi-user Communities

The research reported in this paper was carried out in collaboration with the American Air Museum (AAM) which is located at IWM Duxford, and part of the Imperial War Museums' family. It focuses on image and mission data available through a web portal [6], incorporating a large online archive of media and information about American airman and civilians in Britain during World War II. The AAM website was created to reach out to interested parties, both to inform and to collect information from people who have interest in these matters. So, much like Wikipedia, it has been designed to accommodate crowdsourced contributions; anyone can upload their own photographs, stories or other information and link it to other appropriate entries.

AAM surveys have shown that there are many different types of user operating on the AAM website; historical researchers, enthusiasts, family historians, museum volunteers and casual visitors. For the purposes of this research, the idea of 'user type' is associated with community of interest. There is an internal community made up of enthusiast maintainers, one-time contributors and casual learners. There are also many forum and Facebook based external communities

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[3]`http://www.britishmuseum.org/research/collection_online/search.aspx`
[4]`http://www.iwm.org.uk/collections/search`
[5]`http://www.sciencemuseum.org.uk/online_science/explore_our_collections.aspx`
[6]http://www.americanairmuseum.com

that use the website content to support their own activities. These are mainly military history communities but there are also non-military interests such as digital photography, clothing and model-making communities especially interested in the photographic content the website provides. The information space must therefore support all the these users needs concurrently. The goals and activities of users are diverse and at times conflicting; people want to search, receive information and contribute in different ways. It is therefore in the interest of museums, and perhaps other information-rich multi-user websites, to develop tools and mechanisms to support a multitude of information seeking and sensemaking behaviour.

Search functionality for finding specific information can be implemented using keyword search or faceted filtering. These mechanisms are only useful to those who know what they are looking for. To a non-specialist, a large archive may contain some interesting information but a large amount of time and effort is needed to sort through it. Enthusiast users of the American Air Museum website know the exact phrase to use in keyword search to find exactly what they are looking for, a type of aircraft or serial number for example. Casual users are unable to do so and may end up searching for their family name or home town in hope that something interesting come up. There are many interesting photographs and stories within the database but a large amount of time and effort (or luck) is needed to unearth them. Opening up large museum databases to engage the general public thus sets a clear requirement to accommodate them with new models of access and reflection.

1.3 Sensemaking in HCI

Sensemaking is a term used to describe the cognitive processes involved in searching for and finding meaning in information (Russell et al., 1993). Pirolli and Card provide an broad description of the sensemaking process used in intelligence analysis (Pirolli and Card, 2005). Their cognitive model of sensemaking is made up of two processing loops; a 'foraging' loop, where data is filtered and organised, and a sensemaking loop, where a representational schema of the data is iteratively developed to form an understanding of the data. Information foraging is a metaphor for speculative exploration and harvesting of data that are believed to be relevant to a person's current information needs. The sensemaking loop thus drives subsequent iterations of the foraging loop by identifying additional information needs.

Museum visitors all operate within the same information space but they navigate through and make sense of the information in different ways due to the influence of their own past experiences, knowledge and biases. Pirolli and Card's model is primarily concerned with expert users with well defined tasks and goals but there is a need to further explore sensemaking processes in the non-expert members of the online community. Many online and offline museum visitors are non-experts in an unfamiliar learning environment and they are there because they want to make sense of the artefacts. The Pirolli and Card model also reflects an objective type of information work that may not correspond very well to the emotional, experiential outcome that museum visitors seek.

Dervin uses a gap-bridging metaphor to explore the sensemaking process (Dervin, 2003a). The gap can be seen as an information need which can be bridged with ideas, memories, beliefs or an emotional response. A person is

continuously moving through time and space making and un-making sense by bridging gaps. This metaphor may be useful when exploring how people make sense of historical data; sense can be made in a number of ways and Dervin's metaphor allows for a context-sensitive approach to be made. Looking at how the gaps are bridged in different contexts may reveal what problems people have when sense making and how they deal with them; which in turn may suggest possible solutions. Although Dervin's approach to sensemaking is more interpretive than Pirolli and Card's, the potential role of emotional response is clear as a driver of the process. Our studies thus took advantage of this concept in framing encounters with historical data.

2   Exploratory Studies

Our studies were designed to evoke thoughts, feelings and interpretations of AAM images in an attempt to help visitors articulate their meaning. Many visitors pass through the physical museum site at Duxford on a daily basis, having demonstrated their interest in its exhibits by paying an entrance fee. So we had reason to believe that visitors to the physical site would have motivation and interest in the digital archive, given the commonality of subject matter. Although we are primarily interested in digital encounters, we wished to examine the manner in which people might consider digital information in a rich and provocative context, allowing the investigator to follow up reactions in the moment. We further assumed that the sense and relevance of the digital artefacts would be augmented by experiencing them in the physical museum setting; the act of visiting the museum was thought to have *primed* them for encounters with historical information. We return to this methodological decision in our discussion.

The methodologies used for the two studies were similar. The first study was designed to be an initial step for exploration of how visitors engaged with photographic historical information. The second study was undertaken to follow up and focus on the key interpretations from the first study.

2.1   Preparation

Prior to the studies taking place, an ethics review was completed which in turn informed the creation of a study briefing and consent form. The subject matter of the AAM covers events that are within the living memory of many visitors. For this reason, it is capable of evoking personal reactions that are rather different to, for example, a museum that archives and curates exhibitions of medieval life. The 'crowdsourcing' motivation of the AAM website owes in part to the oral history potential in its visitors for providing first-hand accounts. Yet the accounts themselves could be personally harrowing, associated with loss and bereavement as well as camaraderie. At the time of the study the potential participants were asked to read, agree to and sign these documents before commencing the study. Participants were verbally given instructions to the tasks and were explicitly reassured that they could terminate their involvement at any time if they felt they did not want to continue.

2.2 Exploratory Study 1

The study took place at Imperial War Museums Duxford within the AirSpace hanger; a building that exhibits numerous aircraft to tell the story of aviation in Britain and the Commonwealth. This context within which this study took place may have had some influence on the data collected. The presence of artefacts and information closely related to the topic being addressed in the study may have influenced the answers that the participants gave.

The building is located right next to the entrance of the museum site and so is usually the first building that visitors enter. If the study had been conducted near the end of the visit there may have been more references to artefacts around the museum in responses to the questions. This could be seen in one participant's answer to Q1 when presented with image A. They had visited the museum in reverse starting with the buildings furthest away from the entrance and then working their way back. The participant talked at length about the Jeep in the image because they had just seen one that was part of an exhibition in another building.

2.2.1 Study Method

The photography sense-making study was informed by Dervin's 'knowledge gap' approach to sense making by asking three open-ended questions about historical images. Participants were shown three photographs in sequence on a tablet computer. These images depicted different subjects; Image A: an airman on a Jeep (Figure 1), Image B: a bombing raid (Figure 2), Image C: A group of airmen and red cross workers eating in a mess hall (Figure 3). These images were taken from the American Air Museum website and were chosen because they each had a clear and distinct subject matter that participants would be able to consider.

((photos here))

Participants were shown the photographs one after the other in a specific order and asked three predefined questions for each image:

Q1: What's going on in this photograph? This question was asked to make sure that the participant had fully considered the photograph and to externalise their initial sensemaking process.

Q2: What more do you want to know about the subjects of the photograph? What other questions spring to mind? This question was asked to uncover the gaps in knowledge that the participant had interest in bridging.

Q3: Can you tag this photograph with descriptive or emotional keywords or phrases? This question was asked to allow the participant to sum up their key thoughts and feelings about the photograph and to provide some indication of what the meaning of the photograph was to them.

2.2.2 Results

Although the study took place over three days it wasn't until the second day that the study methodology was finalised. The first day of the study was used to trial variations of the questions and to gauge how participants reacted. Therefore the data presented in this report is taken only from the participants on the second and third days of the study. In total 12 sessions were run on these days with participants taking part either as individuals or as a pair. One session

was terminated due to the negative psychological impact image B had on a participant. Therefore only 11 of the sessions were used for data analysis.

After the first day of the study it was noted that participants would reference previous photographs when describing the current one. It was decided that the order in which the photographs were shown should be changed to reveal if the order in which they were shown had a significant effect on the participants sensemaking process. On the second day of the study the order was kept the same as the original; Image A - Image B - Image C. On the third day this order was reversed. In total there were 5 study sessions on the second day (without the terminated session) and 6 sessions on the third day. The results can be seen in section 3.

If a participant displayed specialist knowledge at any point during the study it was noted. This allowed for the results to be stratified in relation to how those with and without existing specialist knowledge interacted with the presented information. Specialist knowledge was displayed if the participant identified a vehicle, rank or any other historical artefact in the photographs. For example, some participants correctly identified the aircraft in image B as B-24 Liberators. Most of this identification behaviour was in response to Q1 as the participants described the image. It was assumed that if the participant did possess expert knowledge relating to the images it would have been expressed at some point within the study session due to the number of opportunities there were to express it. Participants were also asked what their level of interest in the subject matter was at the end of the session.

Fields notes were taken by the researcher of participant's responses as the study progressed. It should be noted that participants could give as many answers as they thought necessary for each question when interpreting the tallies. Therefore these tallies were not judged on their quantitative value but on their qualitative meaning. The results were coded by the researcher who ran the study.

2.2.3   Analysis

The responses to Q2 were tallied and tabulated for each photograph. Discrepancies between responses that carried the same meaning were added to the same tally. e.g. "Where are they?" and "Where are they flying over?" for image B were seen as the same question.

The responses from Q3 were compiled into two tables to show the two sets of responses from different sequences of photographs. Those from the original sequence the photographs were shown in and those from the reverse sequence. Discrepancies between responses that carried the same meaning were added to the same tally. e.g. "mud" and "muddy" at the discretion of the evaluating researcher.

The second question (Q2) was intended to expose any further questions that the participant had about the photographs. The results suggest that participants were most likely to ask where the subjects of the photograph were or when it was taken. Placing the subjects of the photograph in space/time seems to be an important part of how people make meaning from the image. People have existing knowledge of historical events such as World War II; they may know the places it was fought and the time period. Asking general questions such as when and where puts the content of the image in context of what is already

known.

The more specific questions that were asked were concerned with either identification of people or objects ("What type of plane is that?"), making sense of ambiguous activities (What is he reading?"), or resolving eccentricities in the image ("Why are there woman in the officers mess?"). Understanding why people ask these questions may have consequences for design of navigable online information spaces. The questions people ask may indicate where they might navigate to next if they encountered the information on a website. When they ask a question they give indication to the interests or narrative tensions that the image provokes.

When asked Q2, it was found that those who displayed specialist knowledge were less likely to ask any questions and in some cases no questions were asked at all. These participants would often give more information about a related topic than ask for more information.

The final question (Q3) asked the participants to tag the images with a few keywords or phrases that they associate with the photograph. This was to get some indication of the participants main thoughts and feelings about the subject of the photograph. In some way these tags may summarise the sense that was made during the previous two questions. It was found that the tags were mostly descriptive ("Jeep", "Mud", "Tea") with only a few being affective ("Terrifying", "Fear"). Affective tagging was almost exclusively used for Image B.

2.2.4 Findings

One interpretation of the data in the first study was that there may have been a *cueing effect* at play when participants were making sense of photographs. The sequence in which the images were shown was reversed for half the participants and seems to have had an effect on how the images were tagged. It may be that when making sense of a photograph there are influences from previously viewed photographs that make an impact on the interpretation. The first order of images (Image A → Image B → Image C) produced many affective tags for image B whereas the reverse order (Image C → Image B → Image A) produced far fewer affective tags and more descriptive tags. The suggestion being that there may be something about viewing image B after A that provoked a more affective response. One possible reason for this was thought to have been the more personal nature of Image A (a man sitting on a Jeep) preceding the devastation of image B. Having a more intimate notion of an airman may have produced the more affective response to the bombing mission photograph. The existence of such a cueing effect may have implications for the design of navigation systems across a photographic information space. If viewing certain images before others produced a more engaging experience it may be favourable for museums to design systems that use this phenomenon to drive *meaningful movement* across their collections. In hindsight, the existence of the cueing effect may not have been a significant inference to make based on the data that was collected. The tags were tallied based on the number of times they were given as responses across all participants. However, participants were allowed to give as many responses as they thought appropriate leading to some participants giving more responses than others. One should always treat quantities with caution in a qualitative study: the interpretative nature of the enquiry mitigates against

the use of predictive language such as the concept of 'cueing'. Further, larger-scale studies designed specifically for hypothesis-led investigation would be more suited for the exploration of this type of phenomenon. It is more significant that, when prompted to make sense of the historical photographs we used in our study, our participants chose to use emotional language unbidden and referred to the people in these images as social agents.

2.3 Exploratory Study 2

The second exploratory study was a direct follow up to the first. It followed up on the main insight from the initial study with an adapted methodological approach to introduce more grounded theory methods for collecting and analysing the data.

2.3.1 Adapted Methodology

To a large extent the core idea of the study remained the same as the first study; the same three questions influenced by sensemaking were asked in the same order. However, another set of photographs was introduced in order to ensure that a possible cueing effect was not a simple by-product of the first set of photographs. The second set of photographs were chosen to be representative of the objective, descriptive qualities we associated with the first set: a photo of a man in repose on his own, a bombing mission without visible people, and a group photo in a mess hall. In this way, the study would explore participant's responses to general attributes of historical photographs: a single individual not in action, a group of people not in action, machines in action.

In the first study data was collected through field notes. This made it difficult for the researcher to make detailed notes about what the participants said and did while concurrently thinking about and asking suitable follow up questions. In the second study audio recordings were made for each session. Not only did this free up the researcher to concentrate on the interview process but these recordings were later transcribed in full which also provided richer data for analysis.

It was during this second study that more grounded theory procedures were adopted to strengthen the emergent theory building process. Memoing for reflexivity and hypothesis building were used throughout the data collection and the analysis process. These memos encouraged connections to be made between the emerging data, literature and any ideas or interpretations that were generated.

The study ran over three days in the same setting as first. A total of 14 sessions were conducted in which the set and order of photographs were rotated. Set A in A $\rightarrow$ B $\rightarrow$ C configuration was run in 4 sessions. Set A in C $\rightarrow$ B $\rightarrow$ A configuration was run in 3 sessions. Set B in A $\rightarrow$ B $\rightarrow$ C configuration was run in 4 sessions. Set B in C $\rightarrow$ B $\rightarrow$ A configuration was run in 3 sessions.

2.3.2 Analysis

Analysis of the second study was conducted differently to the first study, being more in line with grounded theory methods of analysis. A process coding technique was used in the analysis phase of the second exploratory study (Saldaña,

2009, p. 96-100). *Gerunds* (-ing words) were used to code actions. These could be observable actions (laughing, pointing) or conceptual actions (reflecting, empathising). The focus on gerunds is congruous with Dervin's idea of *verbings* as gap bridging efforts of the individual (Dervin, 2003b). This lays emphasis on the thought processes that the participant was taking part in and was therefore thought to be more indicative of how they were engaged with the data.

The transcripts were coded line by line. Each code can be seen as an interpretation of the data; therefore each line could be interpreted in more than one way and thus given multiple codes. Take the following line for example:

Looks as if he's quite relaxed, and he's having a coffee, **he's obviously waiting for something to happen maybe they're waiting for some planes to come back I don't know.** *He looks more (..) relaxed or tired, overwhelmed."* (P78)

This was coded with three codes; *"empathising with the man in the photo"* (shown above in italic text); **"hypothesising on why the man is there"** (bold text); "describing what the man is doing" (normal text).

Once grouped into concepts as the analysis proceeded. These concepts were constantly in flux during this procedure; some concepts were merged, others disappeared as analysis continued. The grounded theory concept of constant comparison is evident here as coded observations are connected and abstracted to higher level concepts.

A list of these concepts can be seen in table 1. In some cases the concepts quite naturally formed such as *Questioning* or *Wanting context*. Little interpretation was needed to group codes together in these concepts as can be seen in the examples given in the table. However, in other cases grouping codes was more open to interpretation. Just as lines of transcript could be coded in multiple ways, codes could also be a part of multiple concepts. For example, the process of describing something can also hold inferences about a subject. In the simple phrase "He is drinking coffee" it may seem to the participant they are describing what they see in the photograph but inferences have been made on some level in their thought process. They cannot see what is in the cup so perhaps an assumption is made based on other cues in the photograph or from the participants prior knowledge; the type of cup, the man looks American, American drink coffee, etc. These varying qualities of a code are a reminder that the open coding process is highly interpretive and the emerging concepts should be treated as such. They describe how participants think about the historical material provided when asked particular questions in the context of a museum setting, but they allow for *grounded research questions* to emerge when the concepts are connected.

Concept	Description	Example
Alluding to information need	Explicitly or implicitly shows need for information	"I don't know if it's a letter from home or its a bit of a newspaper - I don't know" (P71)

Commenting on photograph	The participants makes a comment the actual composition or qualities of the photograph	"It's actually quite a nice photograph that" (P74)
Describing	Participant is describing what they see in the photo	"Well, he's having a cup of tea on top of a Jeep" (P67)
Displaying Knowledge	The participant recalls knowledge about the photograph's subject matter	"Also these guys dropped their bombs in daylight and they could be seen from miles away" (P74)
Empathising	The participant talks about how they think the people in the photograph are feeling	"...joy, forgetting about why they're there sort of thing, putting it in the back of their heads" (P75)
Hypothesising	The participant talks about what they think has happened before or after the photograph was taken	"I think he's been at war and he's stopping and he's having some tea" (P79)
Inferring	Analysis of the photo through assumptions or inferences	"I would say that's in the UK knowing how grim it is" (P76)
Questioning	The participant asks a question	"What their target was - were they actually just going to destroy a city?" (P72)
Reflecting	The participant shows some degree of reflection and making connections about the subject matter of the photograph	"We have to thank these people who flew these air planes for what they did for us during the war. they got together with the allies and brought freedom to Europe. Unfortunately now we're giving away" (P71)

Responding emotionally	The participant makes a reference to their own feelings	"But this way with planes dropping 20 bombs each and that is horrendous, absolutely horrendous" (P71)
Seeking personal connection	The participant expresses a desire to know more personal information about the subject	"It makes it more humane and it brings it home to you. If it's just somebody anonymous (...) If you knew his name it's more personal" (P78)
Showing insecurity	The subject shows they feel insecure about their knowledge	"(...) It's difficult. You've got to say something that not you know" (P79)
Stereotyping	The participant makes a assumption based on assumed nationality of the subject	"Probably they don't like tea. That's a big British mug (laughs) they're desperate for a cup of coffee" (P78)
Wanting context	The participant displays a desire to know the context of something	"Well you can't imagine how people are unless you know roughly the time span, where they are, the date what they are doing, you can't actually place them properly can you?" (P73)

Table 1: Concepts developed from codes during analysis

3 Discussion

While the concepts laid out in table 1 provide an abstract description of how people talked about the photographs we can make further connections between these concepts and further abstractions with a theoretical sensitivity for engagement.

Displaying specialist knowledge was a concept that contained codes that described when the participant was talking about their own historical knowledge. It is reasonable to assume that those participants without a *display of knowledge* code are those that are non-specialist users that make up part of the museum visitor population.

The *empathising* code used in the analysis was given a similar meaning to it's dictionary definition: *The power of understanding and imaginatively entering into another person's feelings*[7]. Codes were grouped as empathising when the code directly referred to how a subject in the photograph was feeling.

Out of the 14 sessions run for the second study 4 of the participants made displays of historical knowledge in their interviews. 7 of the sessions had codes that were grouped in the *empathising* concept. With the exception of P71, all those that displayed empathy did not display historical knowledge. This may tell us that in lieu of historical knowledge about a photograph participants connect to an emotional aspect of the material offered. It is important to note that our participants volunteered these emotional descriptions were given without any form of briefing, prompting or cueing. In designing our study, we explicitly excluded any reference to affective terminology or concepts: the researcher *did not ask* along the line of 'how do you think they are feeling?'. All prompts followed the Dervin three-question rubric for sensemaking. This suggests strongly that the use of emotional language is a spontaneous recourse of non-specialist visitors to express the meaning of historical photographs.

We argue that this use of language points to empathic engagement as something that people gravitate towards as a means of making sense of historical information. We must acknowledge that two thirds of our photographs included images of people and so it necessary to qualify this argument somewhat. It is possible that an empathic sentiments are evoked only when visitors see images of people in historic settings, and that encounters of this sort promote emotional engagement. However, the fact that the planes-at-war images were presented together with photographs of people may support emotional thinking beyond even when people are present only by implication (planes don't fly themselves; bombs fall on people).

The findings we have presented in this chapter must be contextualised by our decision to examine encounters with digital representations of historical information in vivo. We were concerned that, for example, relying on an online survey or open comments in a relevant forum might (a) detract from the curated nature of the content of the museum and (b) fail to expose dimensions of the personal meaning of the artefacts we included. The richness of visitor responses have justified the latter but the fact of visiting the museum might under-represent the collective nature of comment on externally linked artefacts. The spread of such links to a network of communities is potentially important but is beyond the remit of the studies here. At the same time, it may be that the strength of feeling expressed by some of our research participants may have been less intense outside of the physical immanence of the historic aircraft and other artefacts that surrounded them. We argue that the emotional and empathic nature of so many of our participant responses are highly likely to characterise non-specialist sensemaking work in purely digital contexts. At the same time, for all that an emotional characterization of engagement is valuable, it is certainly not sufficient in the context of a museum's historical mission.

In terms of Dervin's sensemaking metaphor, a knowledge gap may be bridged using emotion. A participant might ask "where is that man?", the lack of knowledge can be bridged using the perceived emotional state of the man; "he looks happy so he can't be anywhere hostile". However this concept may also

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[7]http://www.collinsdictionary.com/dictionary/english/empathy

lead to confusion. Participant P68 was shown Photo A from set B and was convinced that the scene in the background was a POW camp. The relaxed emotional state juxtaposes this and leads to them to express confusion as to why he would be feeling this way in such an environment. The emotional reading of the scene is at odds with the reading of the context and prior knowledge of the participant. So, while emotional information may be used to make-sense where knowledge is lacking, the sense-made may not always be credible.

The way in which participants reflect upon the photograph's subjects also seems to be influenced by the possession of historical knowledge. *Reflecting* is a concept made up of codes where the participants gave thought to or made connections related to topics not directly observable in the photograph. While there is not a noticeable connection between demonstrated knowledge and *amount* of reflection around the subject matter, there does seem to be a difference in the nature of the reflection. Those that possessed historical knowledge appear to be able to reflect on the political, or military tactic aspects to the time period. Those without knowledge reflections were more hypothetical and about a presumed day-to-day life of the subject. Within both groups there was reflection on present day military tactics in relation with the carpet bombing perceive in image B.

The findings of this small study suggest that participants engage with historical material in relation to the bounds of their knowledge. Those with deeper knowledge about the subject of the photograph seem were able to talk and reflect in terms of what they know. Those who didn't display any historical knowledge within the study session may make meaning from the material on emotional terms instead. This emotional aspect of the material may have an important role to play in engaging non-specialist visitors with online museum collections. Designing experiences that foster emotional engagement with historical material may provide those that lack relevant knowledge with an entry point to a collection from which they can deepen their understanding of history, learn and reflect.

The second study provided no further evidence to support our initial interpretation of the first; that there is an existence of the cueing effect when considering photographs in a sequence. The addition of an extra set of photographs and the small number of studies conducted did not lend itself well to quantitative analysis of the tags. There were simply too few sessions run to make a significant quantitative evaluation. The study method may not have been sympathetic to investigating this type of phenomenon and further exploration of this topic may be suited to a more controlled experiment than open interview questioning. What has been revealed are clues about how people engage with historical information in relation to their prior knowledge and emotional description of the subjects in the images. This in turn provides us with a suitably narrow area of research about how emotional engagement can foster meaningful navigation through a collection of historical material.

4   Future Directions

We have argued for approaches to designing engagement with historical information from a different angle to conventional archive navigation mechanisms; keyword and faceted search. The implications, we feel, are primarily towards the

exposure and sharing of feelings that may be provoked by encounters with the past. It is conceivable that such alternative approaches might (a) seek methods to reflect the feelings experienced by visitors, (b) expose records or responses generated by such feelings to others as alternative 'traces' of encounters with the past, and (c) foster interconnections of emotional traces as a way to generate mutual recognition amongst those who visit.

Museum websites have to cater to a wide variety of user types with a diverse set of needs and motivations. The casual visitor, a historical researcher and an enthusiast all demand different experiences from an online museum collection. Understanding how different user groups engage with and make-sense-of information can inform the design uncurated information spaces and the development of web-based museum ecosystems that facilitate multiple modes of engagement concurrently. It may be beneficial to think about how members from different communities and interest groups can support each other's activities and goals. This approach to design can already be seen in certain crowdsourcing projects. Enthusiasts and to a lesser extent casual users are able to assist heritage professionals and enhance a museum's collection while engaging with information in a meaningful way.

Reactions to the photographs are varied and people bring their own, experience, memories and sensibilities to the interpretation of the material. This was evident in a photo shown during the study which depicted a group of aircraft carpet bombing somewhere in Europe. When shown this particular photograph as part of the sequence, one participant was moved to tears while another 'cheered them on' while maintaining that they had mixed feelings about the scene. The juxtaposition of the affective qualities of such encounters provides a leverage point for reflection on the meaning of the photograph without compromising it's historical validity. Capturing and exposing these personal connections for other visitors to see may help those without specialist knowledge 'break into' a large online collection. Further research needs to be undertaken to inform how to design and implement such systems in which people can search, engage emotionally, and connect to material to find a meaning that resonates with their own life, memory and experience.

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