

# Visual accessibility in graphic design: A client–designer communication failure



Katie Cornish, Joy Goodman-Deane, Kai Ruggeri and P. John Clarkson,  
Engineering Design Centre, Department of Engineering, University of  
Cambridge, Trumpington Street, Cambridge, CB2 1PZ, UK

*It is essential that graphic design is visually clear and accessible. However, evidence suggests that a lack of consideration is given to visual accessibility in print-based graphic design. Furthermore, effective client–designer communication is a vital component in this. This paper investigates current graphic design practice, with regard to visual accessibility, specifically focussing on client–designer communication. A survey of 122 graphic designers and clients identified that these two groups may not be communicating with each other effectively with regard to visual accessibility, and that there is a need to develop inclusive design tools to assist them with this. This paper adds a novel contribution to our limited understanding of visual accessibility in the UK's graphic design industry.*

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

**Keywords:** graphic design, communication, design processes, user centred design, visual accessibility

Inaccessible graphic design is commonplace. From drug packaging (Swayne, 2005) to software interfaces (Keates, Clarkson, & Robinson, 2002) it makes daily tasks difficult or even dangerous. Due in part to an ageing population, it now is estimated that two million people in the UK have some form of sight loss (Access Economics, 2009) with many more being affected by milder age-related visual problems. Furthermore, the introduction of the Disability Discrimination Act (DDA, 1995), and the Americans with Disabilities Act (ADA, 1990), result in strong legal, social responsibility and business drivers (Waller, Bradley, Hosking, & Clarkson, 2015) to ensure that graphic design is visually accessible. However, designers report that a lack of client requests for visual accessibility limits the consideration they can give to it (Dong, Keates, & Clarkson, 2004). Clients also hold the misconception that designers will take visual accessibility into account even if it is not in the brief (Cornish, Goodman-Deane, & Clarkson, 2015). This suggests that designers and clients may not be communicating effectively. A widespread study of the graphic design industry is vital in determining what happens with regard to visual accessibility in practice.

**Corresponding author:**  
Katie Cornish  
[klc49@cam.ac.uk](mailto:klc49@cam.ac.uk)



[www.elsevier.com/locate/destud](http://www.elsevier.com/locate/destud)  
0142-694X *Design Studies* 40 (2015) 176–195  
<http://dx.doi.org/10.1016/j.destud.2015.07.003>  
© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

This paper presents the results of a survey of the graphic design industry. It investigated the factors that influence how important graphic designers and clients deem visual accessibility to be, the extent to which it is considered in practice, and the extent to which clients and designers communicate regarding visual accessibility. Inclusive design tools that aid client–designer communication could provide an important supplement to existing tools, and result in a greater uptake of inclusive design in industry. This paper provides valuable insight into graphic design practice with regard to visual accessibility. It is hoped that this work, and subsequent research, will help to develop new procedures, processes and tools, to improve client–designer communication and assist graphic designers in creating visually accessible designs.

## *1 Background*

### *1.1 Graphic design*

Graphic design is inextricably linked to the effective communication of visual information in society (Frascara, 1988), with some now referring to it as ‘visual communication’ or ‘communication design’ (Meggs & Purvis, 2011). This emphasis on visual communication highlights the importance of visually clear and accessible graphic design, to ensure that visual information is correctly received by the user.

This paper focuses solely on graphic design, as it has its own unique design processes (Dubberly, 2004) and therefore its own client–designer communication methods. It is important to note that in graphic design (as well as several other design disciplines) the client acts as an intermediary between the designer and the user. The client commissions the designer with a project through a brief, which the designer must fulfil, to satisfy the client and to be paid. For this reason both the client and designer must be considered when investigating the design process.

Graphic design encompasses many areas, from typography to film (Buchanan, 1992). Print-based graphic design presents particular challenges with regard to accessibility, as these designs cannot be modified by the user in the way that designs can on screen, forcing the audience to rely heavily on their visual capabilities. Print-based graphic design is also under-represented in the literature, especially when compared to the related area of web design. Therefore, this paper focuses solely on print-based graphic design.

### *1.2 Client–designer communication*

Communication within the design process has received much attention within the academic literature (Brown, 2002; Chiu, 2002; Eckert, Cross, & Johnson, 2000). Since the seminal work by Schön (1988), it has been recognised that clients and designers occupy different design worlds, making communication challenging. Ineffective communication can lead to a misunderstanding of

important information. However, much of the research surrounding client–designer communication is in architecture (McDonnell & Lloyd, 2014; Tzortzopoulos, Cooper, Chan, & Kagioglou, 2006) and product design (Crilly, Moultrie, & Clarkson, 2004).

The work by Paton and Dorst (2011) is one of the few pieces of literature that investigates client–designer communication in graphic design. They found that during the briefing process the establishment of a common language between the client and the designer is vital for communicating successfully, particularly when developing the brief. One way of achieving this is through the development of inclusive design tools to aid client–designer communication (Zitkus, Langdon, & Clarkson, 2013a), although it is not known whether this applies to graphic design.

### *1.3 Inclusive design and visual accessibility*

Inclusive design is ‘a general approach to designing in which designers ensure that their products and services address the needs of the widest possible audience, irrespective of age or ability’ (Design Council, 2008). It is essential to consider inclusivity across all design disciplines for legal, social, and business reasons (Waller et al., 2015), and much research has focussed on how we can assist designers in achieving accessible designs (Clarkson & Coleman, 2015). It has been suggested that the client and the designer must both drive the need for inclusivity (Warburton, Desbarats, & Hosking, 2015). However, it is not clear whether these findings apply to graphic design.

The term ‘visual accessibility’ in this paper refers to the clarity of the images, text and other design elements, and the ease in which the viewer of that design can see the information displayed. Unclear graphic design can lead to serious errors being made by the user. For example, it has been estimated that 10 000 injuries or deaths a year in the US may be as a result of poor medication and packaging design (Kenagy & Stein, 2001).

The importance of visual accessibility is much higher in graphic design than in other disciplines such as product design. Within graphic design, visual accessibility is a key element that determines overall inclusivity, whereas product design must meet accessibility requirements in terms of the user’s physical capabilities as well.

### *1.4 Inclusive design tools and methods*

Research specifically focussing on visual accessibility in graphic design is lacking. There are a variety of tools and methods to assist designers from all disciplines when considering their users, such as the Inclusive Design Toolkit (Clarkson, Coleman, Hosking, & Waller, 2011), *Userfit* (Poulson, Ashby, & Richardson, 1996), *The Universal Design Handbook* (Preiser & Ostroff, 2001) and the methods proposed by Stanford D School (Stanford University,

2014). Product design research has identified that tools to aid the consideration of inclusivity are profoundly underused in industry (Zitkus et al., 2013a). This could be due to a poor fit between these tools and designers' thought and work processes (Cardello, 2005), especially as they are often aimed at a broad range of designers from different disciplines, thus highlighting the importance of discipline-specific research.

Accessibility guidance for print-based graphic designers is often in the form of guidelines and legislation, such as the RNIB's Clear Print Guidelines (2006). Safety-critical industries such as rail (British Standards Institute, 2015) and healthcare (European Commission, 2009) also have legislation that stipulates certain aspects of visual accessibility, such as contrast. However, other disciplines such as product design have access to a wider range of information to understand their users, not just guidelines.

Due to the guideline's format, designers often find it difficult to understand and implement guidelines (Zitkus, Langdon, & Clarkson, 2011), which can lead to graphic designers often relying on their own instincts and leading to inaccessible designs (Forlizzi & Lebbon, 2002). Increasing our understanding of graphic design practice, including the barriers and drivers to adopting inclusive design, can help inform the development of more appropriate tools.

### *1.5 Barriers to the adoption of inclusive design*

There are multiple barriers to the adoption of inclusive design. A key issue is that design clients often do not request a need for inclusivity (Dong et al., 2004). This situation is problematic because if the client does not state the need for inclusivity in the brief, then there is little room for the designer to introduce it, which is predominantly due to time and cost factors (Dong et al., 2004). Paradoxically, clients hold the misconception that graphic designers will take accessibility into account even if the client does not specify it in the brief (Cornish et al., 2015). These findings suggest that there may be ineffective communication between the two sides with regard to visual accessibility. However, some of this research focuses on product design only (Dong et al., 2004) and some is based on a limited sample (Cornish et al., 2015), requiring further investigation.

### *1.6 Research context and questions*

Previous work identified a communication issue between clients and graphic designers (Cornish, Goodman-Deane, & Clarkson, 2014, 2015). This paper builds on this previous work, presenting the results from a survey of graphic designers and clients. The questions included in the survey were developed as a result of previous findings. For example, both groups were asked what the other group thought about visual accessibility, to determine whether they are communicating these thoughts effectively. The survey as a whole examined whether graphic designers and their clients are aware of the

importance of visual accessibility in graphic design, and whether previously identified misconceptions about inclusive design generalise to a wider sample. It also aimed to identify the requirements for a visual capability loss simulator tool specifically for use in graphic design.

This paper generally reports the results of the survey, omitting a few results that are too specific to be relevant to this paper. The aim of this paper is to determine what happens in industry with regard to visual accessibility in graphic design, and whether client–designer communication impacts on this. Three sequential research questions were asked to address the topic as extensively as possible, given the time limitations. The specific research questions are as follows:

1. *What factors influence how important graphic designers and clients deem visual accessibility to be?*

The first question sets the scene by identifying how important the participants think visual accessibility is, and exploring some of the possible reasons for this. It is essential that this be established first, as the results shape the direction of subsequent questions.

2. *To what extent do graphic designers and clients consider visual accessibility in practice?*

The second question builds on the existing research surrounding barriers to inclusive design, but specifically within graphic design. It determines whether the level of importance of visual accessibility determined in the first question, is reflected in practice.

3. *To what extent do graphic designers and clients communicate with regard to visual accessibility?*

The final research question builds on the answers to the previous two questions, and probes more deeply to determine whether poor communication is a barrier. This has been suggested to be the case in other areas of design, but not specifically graphic design.

## 2 Method

### 2.1 Survey instruments

Two surveys were developed and administered using Qualtrics Survey Software (Qualtrics, 2014): one for graphic designers and one for clients, although the instructions and informative text were standardised across the two. The surveys contained multiple choice, yes/no answer questions, and longer qualitative questions, although these were limited to maintain a sufficient response

rate and prevent fatigue effects. The questions were developed based on the results from two previous interview-based studies and were extensively piloted to remove ambiguous questions and to ensure validity (See the [Appendix](#)).

When investigating the importance of visual accessibility in graphic design, and the consideration given to visual accessibility in practice, the following factors were considered: designers being taught about visual accessibility; clients being aware of design guidelines; and the age and level of experience of both groups. These factors were deemed by the researcher as being likely to have an influence, based on both published and unpublished prior work ([Cornish et al., 2015](#)).

## *2.2 Sampling*

The designers' survey was distributed to graphic designers through emails to existing contacts, and contacts identified through Internet searches of graphic design agencies and freelance graphic designers. It was also advertised online using relevant groups on [LinkedIn \(2015\)](#) such as the group titled 'Graphic Design'. The clients' survey was distributed to clients through existing contacts and Internet searches of large companies, charities, local governments, museums, restaurants, tourist attractions, schools and local businesses.

The sample consisted of 67 graphic designers and 55 clients. This sample size was chosen to ensure an adequate sample size for statistical analysis, as calculated by [G Power \(2014\)](#) and the sample used met this requirement. The average age of the graphic designers surveyed was 39, ranging from 18 to 71 years old, and the average amount of graphic design experience was 13 years, ranging from 1 year or less, to 43 years. The average age of the clients was 40 years old, ranging from 24 to 57, with 65% of clients having commissioned a graphic design project 21 times or more. Participants could take part from anywhere in the world, although the survey was conducted in English. The survey was kept anonymous to limit social desirability response bias, and for these reasons the geographic location and nationalities of respondents were not recorded.

## *2.3 Procedure*

The survey was conducted online and was live for three weeks during September 2014. Each participant could only complete the survey once. The University of Cambridge granted ethical clearance for the study. All participants were asked to confirm whether they were a graphic designer (with some experience of print-based graphic design) or a client, to ensure the validity of the results. They were also asked to give informed consent. Any participants who did not provide consent or did not deem themselves to be a graphic designer or a client were thanked for their time but were not allowed to take part.

## 2.4 Data analysis

Comparative data analysis was carried out using SPSS Software (IBM, 2014). Qualitative analysis of open-ended questions was carried out using QSR NVivo (2013).

## 3 Results

### 3.1 Visual accessibility in graphic design

Visual accessibility is important to graphic designers and clients. The graphic designers were asked the extent to which they agreed with the statement ‘visual accessibility is very important in my day to day graphic design work’, while clients were asked about their agreement with the statement ‘visual accessibility is very important in all graphic design work that I commission’. The graphic designers rated their importance of visual accessibility as an average of 4.4 out of 5, and the clients rated theirs as an average of 4.1 out of 5 (See Figure 1).

Clients with more experience gave a significantly lower rating of the importance of visual accessibility (mean of 3.7) than those with less experience (mean 4.3) (Mann–Whitney U,  $p < 0.05$ ). However, there is no significant difference in client’s average ratings based on their age or their awareness of design guidelines. There is also no significant difference in the graphic designers’ average ratings of importance of visual accessibility, based on their age, level of experience or whether they have been taught about visual accessibility.

### 3.2 Visual accessibility in practice

Graphic designers and clients recommend or request that consideration is given to visual accessibility on half of all projects. The graphic designers reported that on average they recommend that it be considered on 51.5% of projects, and the clients reported that on average they request that it be considered on 49.4% of projects. The results are shown in Figure 2.

There is no significant difference in the proportion of projects on which visual accessibility is considered, based on the key variables. A Mann–Whitney U test found that amongst graphic designers, there is no significant difference in the average proportion of projects on which visual accessibility is requested, based on their age, their level of experience or whether they have been taught about visual accessibility. Similarly, for clients, there is no significant difference in this measure based on their age, level of experience or awareness of design guidelines.

Similar methods are used by both groups to consider visual accessibility. Participants were asked, ‘On the average project, how would you go about considering older audiences or the visual accessibility of your design?’ and were given

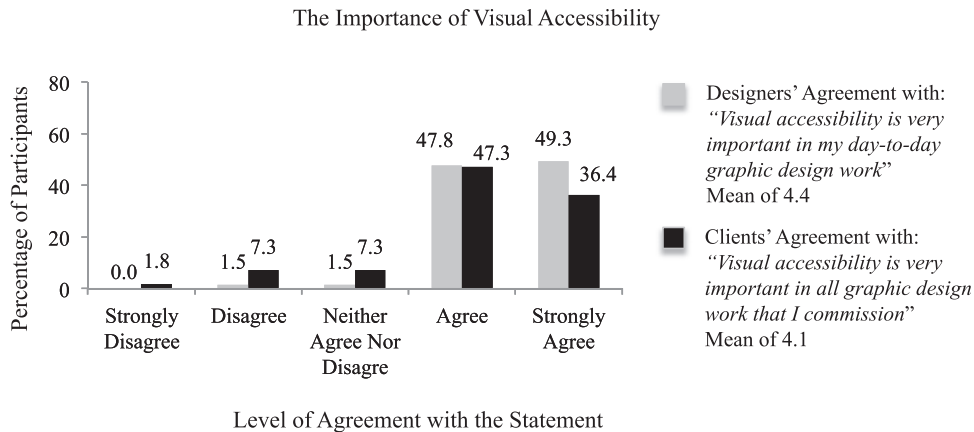


Figure 1 Designers' and clients' importance of visual accessibility

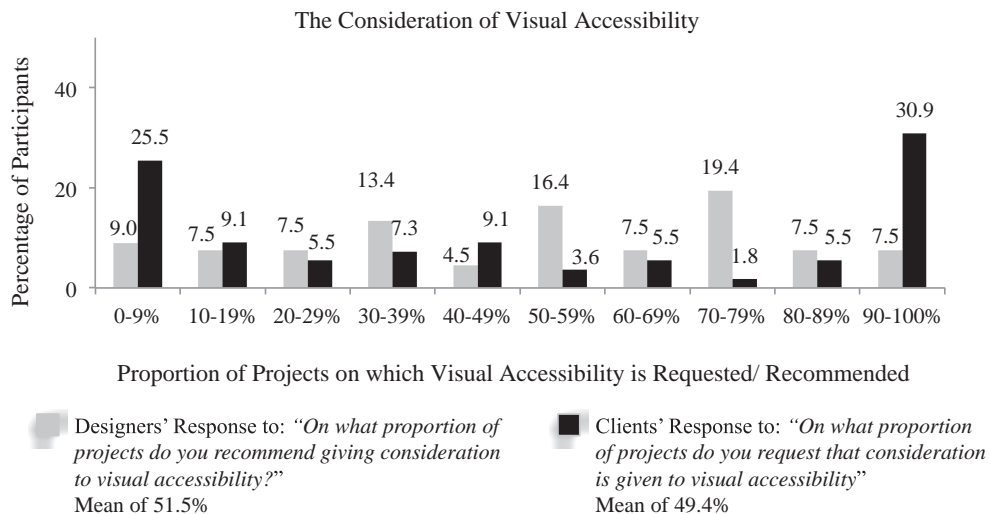


Figure 2 Client and designers request for visual accessibility

a list of potential ways of approaching the issue. Personal judgement was most commonly relied upon (76% of designers, and 66% of clients), followed by design guidelines (43% of designers, and 56% of clients). Only 21% of graphic designers reported that they leave the client to check it, and only 11% of clients report that they leave the designer to check it.

With regard to formal tools, the designers most commonly use user observations (73%) and design guidelines (67%). They were least aware of techniques that simulate a loss of visual capabilities in the designer (19%) and heuristic/expert evaluation (16%). 24% of designers reported that they do not use any of these formal methods or techniques, and 25% said they would prefer not to use any of the ones listed (see Figure 3).



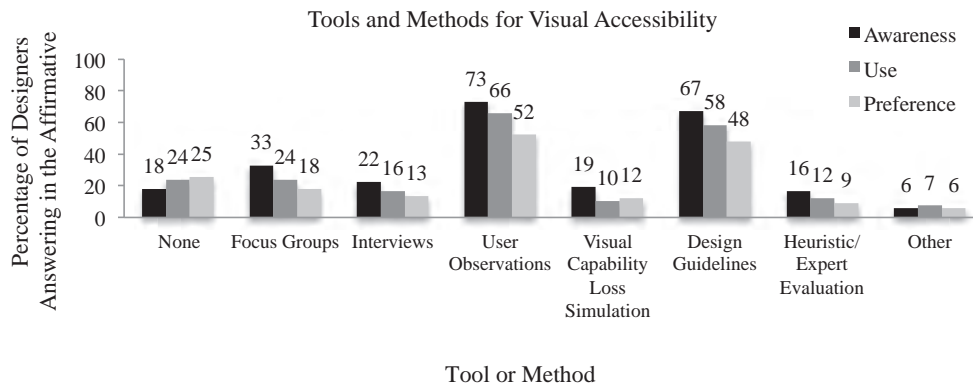


Figure 3 Tools and methods for considering visual accessibility

18% of graphic designers were not aware of any of the formal tools and methods listed. When asked to explain their answers one participant stated *‘I have always considered legibility to be a critical factor in any commercial design, and my awareness has heightened as I have aged. However, I am unaware of any formal techniques’*. When explaining their awareness, use, and preference for tools, 10% of designers, unprompted, specified that they would like to find out more about the tools available, with one participant simply stating *‘I would like to find out more about the tools and methods available to me’*. Another added, *‘I have not used any [tools or methods] but if I could find some information on them I would’*.

Designers recognised the benefits of particular tools and methods. For example, many liked using real people where possible, through user testing or observations. They explained that this is because they can interpret the user’s facial expressions and body language, which aids their understanding of the user’s capabilities. They added that real people could also provide critique on style as well as accessibility, which is particularly useful from an independent source, although they recognised that the use of some tools and methods is project dependent.

25% of the designers would prefer not to use any of the tools or methods. They explained that time and cost constraints prevented them from using particular methods or tools, and that these constraints are set by the client. One participant stated *‘There is rarely the time or budget to do any kind of testing because of the client’s brief’*. Consequently, if clients are not interested in accessibility then the designers cannot justify using what they believe to be potentially expensive and time-consuming tools. Finally, they believe that the tools and methods do not add substantially to their own judgement of visual accessibility. For example, some explained that they had never thought about visual accessibility or older audiences, with one stating *‘I use my own experience to judge whether something is reasonably accessible’*.

### 3.3 *Client–designer communication*

When investigating client–designer communication with regard to visual accessibility a number of comparisons were made between what graphic designers thought, and what the clients perceived them to think, and vice versa.

There is a statistically significant difference between the proportion of projects on which graphic designers recommend that visual accessibility be considered (mean 51.5%), and the proportion of projects on which clients report that graphic designers recommend that visual accessibility be considered (mean 33.3%), ( $\chi^2$  test,  $p < 0.01$ ), (See [Figure 4a](#)).

There is also a statistically significant difference between the proportion of projects on which clients request that visual accessibility be considered (mean 49.4%), and the proportion on which designers report that clients request visual accessibility (mean 28.4%), ( $\chi^2$  test,  $p < 0.01$ ), (See [Figure 4b](#)).

There is a statistically significant difference between the ratings graphic designers actually give to the importance of visual accessibility (mean of 4.4) and the clients' perception of this (mean 3.1), (Mann–Whitney U,  $p < 0.05$ ), (See [Figure 5a](#)).

There is also a statistically significant difference between the ratings clients actually give to the importance of visual accessibility (mean 4.1) and the graphic designers' perception of this (mean 2.9), (Mann–Whitney U,  $p < 0.05$ ), (See [Figure 5b](#)).

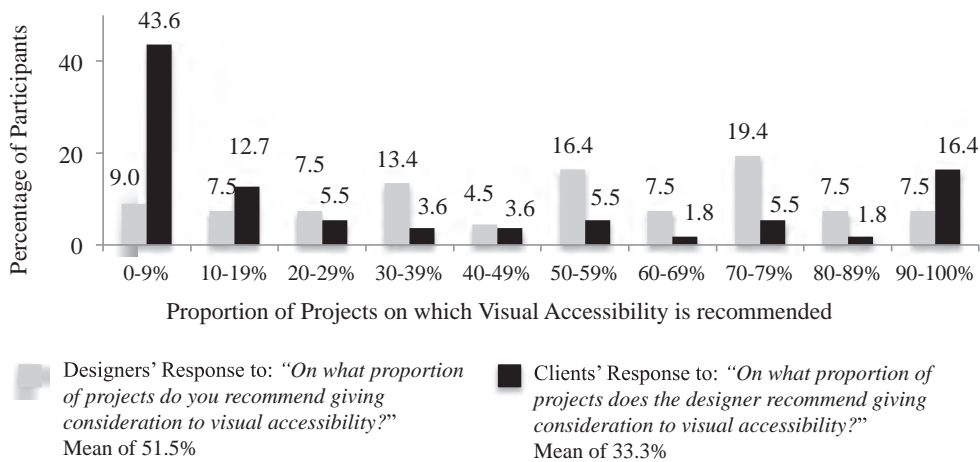
## 4 *Discussion*

This study investigates client–designer communication in the graphic design industry, with regard to visual accessibility. The results highlight three key themes: there is a significant lack of communication regarding visual accessibility between clients and designers; there is a lack of awareness of visual accessibility tools in industry; and clients' importance of visual accessibility decreases with increased experience of commissioning graphic design projects. We need to reconcile, not the perception of the importance of visual accessibility, but the communication of the need for it, between graphic designers and clients.

### 4.1 *A lack of clear communication*

The lack of effective communication surrounding visual accessibility between graphic designers and clients may prevent it from being considered fully in practice. For example, if the client does not include it in the design brief then they do not allow for the time or money to be spent on its consideration, limiting the attention that the designer can give to it and resulting in inaccessible designs. One explanation is that clients may hold the misconception that

**a** The Clients' Perception of the Designers' Recommendation for Visual Accessibility



**b** The Designers' Perception of the Clients' Request for Visual Accessibility

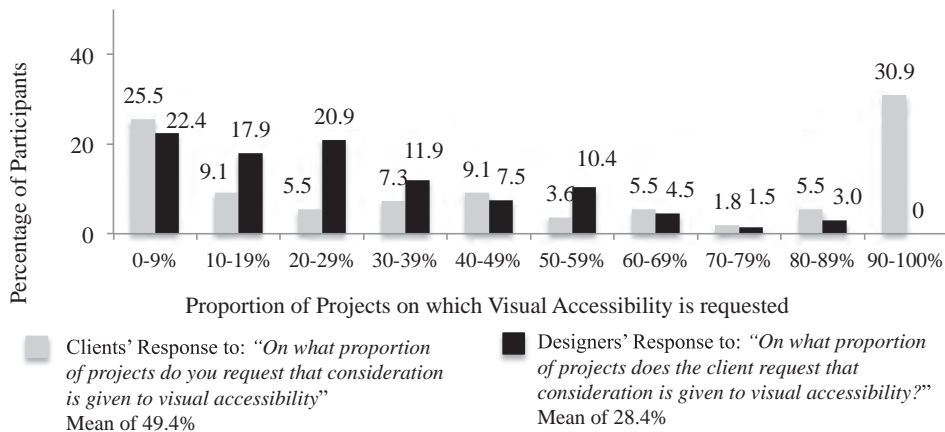


Figure 4 a. The clients' perception of the proportion of projects on which designers recommend considering visual accessibility. b. The designers' perception of the proportion of projects on which clients request considering visual accessibility

the designer will take accessibility into account even if it is not in the brief (Cornish et al., 2015). The results also demonstrate that visual accessibility is not excluded from the brief due to the clients overlooking its importance, as one might expect, but due to client-designer communication issues.

Designers and clients are either not verbalising the need for visual accessibility in conversation with each other, or are they not understanding what the other group has to say. They may not be using the same design language and therefore do not understand what the other side is attempting to communicate. The importance of clear client–designer communication has been recognised in many design disciplines (Crilly et al., 2004; Othman, Hassan, & Pasquire,

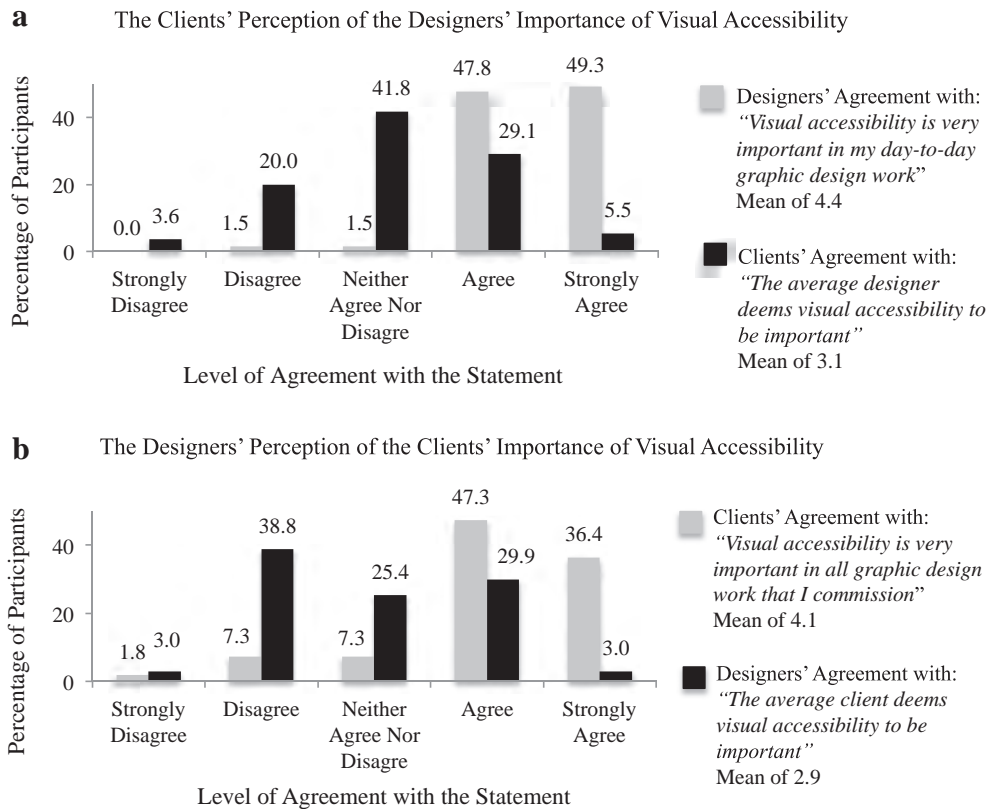


Figure 5 a. Clients' perceptions of the designers' importance of visual accessibility. b. Designers' perceptions of the clients' importance of visual accessibility

2004). The body of work by Zitkus et al. (2013a) and Zitkus, Langdon, and Clarkson (2013b) highlights the need to develop inclusive design tools that aid client–designer communication to improve conversation between designers and clients. This paper adds to this evidence.

The lack of communication between clients and designers with regard to visual accessibility is indicative of a lack within both groups for taking responsibility for the consideration of visual accessibility. Some safety critical industries such as rail (British Standards Institute, 2015) and healthcare (European Commission, 2009) have taken responsibility and developed legislation to ensure accessible graphic design. This is far from the case in many other areas of graphic design. This paper highlights the need for the discipline of graphic design to develop codes of conduct for an ethical design process. This will emphasise the responsibility of both parties, and ensure that consideration is given to visual accessibility where needed.

Graphic designers in particular should recognise their responsibility in considering visual accessibility even if the clients do not request it. Only a small

proportion of designers report that they leave the client to check whether a design is visually accessible. This indicates that they are taking some responsibility for visual accessibility when it is considered, but that the challenge may surround giving it consideration in the first place. The graphic designers need to take more responsibility in driving this.

The participants may have over-emphasised how important they deem visual accessibility to be to them, due to a social desirability response bias. If they do not deem visual accessibility to be as important as they report, then the other group's view of how important they deem it to be may actually be more accurate. However, the survey was self-administered and anonymous, which helps limit social desirability effects.

#### *4.2 Accessibility tools*

Developing design tools to aid client–designer communication surrounding visual accessibility could help improve client–designer communication. However, the results presented in this paper, and in previous literature (Goodman-Deane, Langdon, & Clarkson, 2010), highlight a lack of awareness of inclusive design tools in industry. Therefore we must increase the designers' awareness of these tools, as well as developing them for use in discussions with clients.

Without prompting, a number of graphic designers explained that they want to be made more aware of the tools available to them. This indicates that current inclusive design tools are not marketed appropriately or effectively. There is a lack of research into appropriate design tool dissemination methods, therefore avenues for the dissemination and promotion of these tools in industry should be investigated.

Guidelines are not the best way of giving consideration to visual accessibility but they are still widely used. Both graphic designers and clients reported that they most commonly rely on design guidelines to give consideration to visual accessibility, yet the literature reports that designers often find it difficult to implement the information contained within guidelines (Zitkus et al., 2011). This raises several questions, for example why do designers continue to use guidelines as a source of information? Perhaps it is due to a lack of awareness of other available tools and methods or other constraints such as time and cost.

Many graphic designers would prefer not to use any of the methods or tools listed. This finding may be partially explained by a strong preference by both groups for relying on their own personal judgement. It is possible that the designers feel that their own judgement of visual accessibility is adequate and therefore they do not feel that the tools would add any benefit. Another explanation is that the designers feel that time and cost issues would prevent these tools from being worthwhile. The issues of time and cost have been

identified in previous inclusive design literature and are widely recognised as a barrier that may prevent the consideration of users' needs (Dong, 2004; Maguire, 2001). This adds to the argument for developing quick and cheap tools to overcome these barriers.

The clients sometimes prevent the designers from using visual accessibility tools. The designers reported that the clients make the ultimate decision about the design process, as they are paying for it. If clients do not request that visual accessibility is considered, then the designer cannot give much consideration to it, thus preventing them from spending time and money purchasing and using the tools. However, Da Silva Vieira, Badke-Schaub, Fernandes, and Fonseca (2011) report that clients and other 'non-designers' have less input on design decisions than designers. This raises the question of whether the designers actually need the client to request that consideration is given to visual accessibility, or whether the designers have a responsibility to give it consideration regardless.

### *4.3 Visual accessibility and client experience*

Clients' importance of visual accessibility decreases with experience, and this might be explained by be the relative importance of other factors. It is possible that other factors, such as time and cost, may become more important to clients over time, meaning that visual accessibility is lower on their priorities list. Additionally, more experienced clients are likely to have been in industry longer, and may have started out in the industry when visual accessibility was less important: an opinion that they have maintained into later years. Another explanation is that as the client becomes more experienced and more skilled in commissioning and checking designs, considering visual accessibility becomes a more sub-conscious process that they fail to report in a survey. There is a lack of literature supporting this finding amongst the client population, and therefore it warrants further research.

There are a few limitations to the study presented in this paper, such as social desirability response bias, and explicitly asking about topics that the participants may not have otherwise considered. Participants were limited by their memory and their perceptions of design processes and tools, and it is difficult to detect whether the participants have taken the survey seriously (Robson, 2002). Furthermore, the participants were self-selecting, and the distribution was conducted online, which could bias results. Due to the strengths of the survey method, such as the ability to collect large amounts of anonymous data in a standardised way, it was felt that this was the most valid and reliable method for answering the research questions. Several steps were taken to ensure the reliability and validity of answers, such as extensive piloting, and keeping the survey short and concise to prevent fatigue effects. Future work should focus on carrying

out more in depth qualitative research, to strengthen these results, and identify more concrete explanations.

## *5 Conclusions*

The main findings presented in this paper are as follows:

Poor client–designer communication may be preventing visual accessibility from being considered in the graphic design industry. We need to develop tools that aid client–designer communication surrounding visual accessibility in graphic design. This could include adapting existing tools such as visual capability loss simulator tools (Goodman-Deane, Langdon, Clarkson, Caldwell, & Sarhan, 2007), or developing new ones. Client–designer communication could also be improved through the development of ethical codes of practice, highlighting the responsibility of both groups in driving this issue.

There is a need to investigate more appropriate avenues for visual accessibility tool dissemination and promotion, to overcome the lack of awareness of these tools in industry. For example, these tools should be included in graphic design education, but could also be promoted through design websites, blogs and social media platforms such as YouTube tutorials.

Further research is required to investigate the causes of the clients' importance of visual accessibility decreasing with experience. This paper presents some possible explanations, but these are supposition and require further investigation. This paper also highlights the importance of the client's influence in considering visual accessibility, which is an area that lacks existing research.

We need to reconcile, not the perception of the importance of visual accessibility, but the communication of the need for it, between graphic designers and clients. Acknowledging these issues, and taking steps to improve the situation will help improve the visual accessibility of graphic design for everyone.

## *Acknowledgements*

This work was supported by the UK's Engineering and Physical Sciences Research Council (EP/K503009/1). The raw data from this study cannot be made freely available because inherent to that data is sensitive information relating to the individuals and organisations involved.

## *Appendix.*

The questions reported in this paper, from the graphic designer and client surveys.

## Graphic Designers' Survey

**Graphic Designers' Questions:**

- What year were you born?
- How many years of graphic design experience have you had? For example working for industry or for charity (but not including graphic design education).
- Have you ever been taught about designing for older audiences, either through education or on the job training? (Select one)
 

☒ Yes
 ☐ No
- On what proportion of projects do you recommend giving consideration to older audiences and the visual accessibility of the design? (Select one)
 

☐ 0 to 9%
 ☐ 50 to 59%
 ☐ 10 to 19%
 ☐ 60 to 69%
 ☐ 20 to 29%
 ☐ 70 to 79%
 ☐ 30 to 39%
 ☐ 80 to 89%
 ☒ 40 to 49%
 ☒ 90 to 100%
- On what proportion of projects does the client request that you should give consideration to older audiences and the visual accessibility of the design? (Select one)
 

☐ 0 to 9%
 ☐ 50 to 59%
 ☐ 10 to 19%
 ☐ 60 to 69%
 ☒ 20 to 29%
 ☐ 70 to 79%
 ☐ 30 to 39%
 ☐ 80 to 89%
 ☐ 40 to 49%
 ☐ 90 to 100%
- To what extent do you agree with the following statements? (Select one)
 

Visual accessibility is very important in my day-to-day graphic design work. (Select one)

☐ Strongly Disagree
 ☐ Disagree
 ☐ Neither Agree nor Disagree
 ☒ Agree
 ☐ Strongly Agree

The average client deems visual accessibility to be important. (Select one)

☐ Strongly Disagree
 ☒ Disagree
 ☐ Neither Agree nor Disagree
 ☐ Agree
 ☐ Strongly Agree
- On the average project how would you go about considering older audiences or the visual accessibility of your design? (Select all that apply)
 

☒ I rely on my own personal judgement
 ☐ I use design guidelines
 ☒ I leave the client to check it
 ☐ I do not consider it
- What visual accessibility tools and methods are you aware of? What visual accessibility tools and methods have you used? What visual accessibility tool or method do you prefer to use (if any)? (Select at least one)
 

☐ None of these Methods
 ☒ Focus Groups
 ☐ Interviews
 ☒ User Observations
 ☐ Simulation of Vision Loss
 ☐ Design Guidelines
 ☐ Expert Evaluation
 ☐ Other
- Please explain your answers to the previous question. For example, why have you used a particular method or tool and was it useful? Why do you not use particular methods or tools and would you like to? Why do you prefer certain methods to others?



## Clients' Survey

**Clients' Questions:**

1. What year were you born?

2. How many times have you been involved in (either solely or as part of a team) commissioning graphic design work? (Select one)

☐ Once  
☐ Twice  
☐ 3 to 5 Times  
☐ 6 to 10 Times  
☒ 11 to 20 Times  
☐ 21 Times or More

3. Do you know of any design guidelines that are used for graphic design production in the company you work for? (Select one)

Yes ☒ No ☐

4. If yes, do these guidelines contain any information about designing for older audiences or about visual accessibility? (If no, skip this question).

Yes ☐ No ☒

5. On what proportion of projects does the designer recommend giving consideration to older audiences and the visual accessibility of the design? (Select one)

<input type="checkbox"/> 0 to 9%	<input type="checkbox"/> 50 to 59%
<input type="checkbox"/> 10 to 19%	<input type="checkbox"/> 60 to 69%
<input type="checkbox"/> 20 to 29%	<input type="checkbox"/> 70 to 79%
<input type="checkbox"/> 30 to 39%	<input type="checkbox"/> 80 to 89%
<input type="checkbox"/> 40 to 49%	<input checked="" type="checkbox"/> 90 to 100%

6. On what proportion of projects do you request that consideration should be given to older audiences and the visual accessibility of the design? (Select one)

<input type="checkbox"/> 0 to 9%	<input type="checkbox"/> 50 to 59%
<input type="checkbox"/> 10 to 19%	<input type="checkbox"/> 60 to 69%
<input type="checkbox"/> 20 to 29%	<input type="checkbox"/> 70 to 79%
<input type="checkbox"/> 30 to 39%	<input type="checkbox"/> 80 to 89%
<input checked="" type="checkbox"/> 40 to 49%	<input type="checkbox"/> 90 to 100%

7. To what extent do you agree with the following statements? (Select one)

Visual accessibility is very important in all graphic design work that I commission. (Select one)

☐ Strongly Disagree ☐ Disagree ☐ Neither Agree nor Disagree ☒ Agree ☐ Strongly Agree

The average designer deems visual accessibility to be important. (Select one)

☐ Strongly Disagree ☒ Disagree ☐ Neither Agree nor Disagree ☐ Agree ☐ Strongly Agree

8. On the average project how would you go about considering older audiences or the visual accessibility of your design? (Select all that apply)

☐ I rely on my own personal judgement ☒ I use design guidelines ☐ I leave the designer to check it ☐ I do not consider it

## References

- Access Economics. (2009) Retrieved from: <http://www.rnib.org.uk>.
- ADA. (1990). *Americans with disabilities act. Americans with disabilities act of 1990*. US Public Law 101–336.
- British Standards Institute. (2015). *BS 8300:9.2.1.1-Design standards for accessible railway stations*. Retrieved from. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/415638/design-standards-accessible-stations.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415638/design-standards-accessible-stations.pdf).
- Brown, S. A. (2002). *Communication in the design process*. Taylor & Francis.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5–21.
- Cardello, A. V. (2005). Terminology, reliability, validity, and subjectivity in the search for the “voice of the consumer”. *Food Quality and Preference*, 16(3).
- Chiu, M. L. (2002). An organizational view of design communication in design collaboration. *Design studies*, 23(2), 187–210.
- Clarkson, P. J., & Coleman, R. (2015). History of inclusive design in the UK. *Applied Ergonomics*, 46(b), 235–247.
- Clarkson, P. J., Coleman, R., Hosking, I., & Waller, S. D. (2011). *Inclusive design toolkit* (2nd ed.). Retrieved from. [www.inclusivedesigntoolkit.com](http://www.inclusivedesigntoolkit.com).
- Cornish, K., Goodman-Deane, J., & Clarkson, P. J. (2014). Designer requirements for visual capability loss simulator tools: differences between design disciplines. In *Universal access in human-computer interaction. Design and development methods for universal access* (pp. 19–30). Springer International Publishing.
- Cornish, K., Goodman-Deane, J., & Clarkson, P. J. (13–16 April 2015). Visual accessibility misconceptions held by graphic designers and their clients. In *Contemporary Ergonomics and Human Factors 2015: Proceedings of the International Conference on Ergonomics & Human Factors 2015, Daventry, Northamptonshire, UK*.
- Crilly, N., Moultrie, J., & Clarkson, P. J. (2004). The role of designer-client communication in determining product appearance and consumer response. In *Design research society international conference à futureground*.
- Da Silva Vieira, S. L., Badke-Schaub, P., Fernandes, A. A., & Fonseca, T. (2011). Designer’s thinking and acting in meetings with clients. In *DS 68–6: Proceedings of the 18th international conference on engineering design (ICED 11), impacting society through engineering design. Design information and knowledge, Vol. 6*. Lyngby/Copenhagen, Denmark, 15.-19.08. 2011.
- DDA. (1995). *The disability discrimination act 1995*. Retrieved from. [www.legislation.gov.uk/ukpga/1995/50/contents](http://www.legislation.gov.uk/ukpga/1995/50/contents).
- Design Council. (2008). *Inclusive design education resource*. London: Design Council. Retrieved from. [www.designcouncil.info/inclusivedesignresource/](http://www.designcouncil.info/inclusivedesignresource/).
- Dong, H. (2004). Barriers to inclusive design in the UK. In *CHI’04 extended abstracts on human factors in computing systems* (pp. 1035–1036). ACM.
- Dong, H., Keates, S., & Clarkson, P. J. (2004). Inclusive design in industry: barriers, drivers and the business case. In *User-centered interaction paradigms for universal access in the information society* (pp. 305–319). Berlin Heidelberg: Springer.
- Dubberly, H. (2004). *How do you design? A compendium of models*. San Fransisco: Dubberly Design Office.
- Eckert, C. M., Cross, N., & Johnson, J. H. (2000). Intelligent support for communication in design teams: garment shape specifications in the knitwear industry. *Design Studies*, 21(1), 99–112.

- European Commission. (2009). *Guidelines on the readability of the label and package leaflet of medicinal products for human use*. Retrieved from. [http://ec.europa.eu/health/files/eudralex/vol-2/c/2009\\_01\\_12\\_readability\\_guideline\\_final\\_en.pdf](http://ec.europa.eu/health/files/eudralex/vol-2/c/2009_01_12_readability_guideline_final_en.pdf).
- Forlizzi, J., & Lebbon, C. (2002). From formalism to social significance in communication design. *Design Issues*, 18(4), 3–13.
- Frascara, J. (1988). Graphic Design: fine art or social science? *Design Issues*, 5(1), 18–29.
- G Power. (2014). *G Power*. University of Dusseldorf. Retrieved from. [www.gpower.hhu.de/en.html](http://www.gpower.hhu.de/en.html).
- Goodman-Deane, J., Langdon, P., & Clarkson, J. (2010). Key influences on the user-centred design process. *Journal of Engineering Design*, 21(2–3), 345–373.
- Goodman-Deane, J., Langdon, P. M., Clarkson, P. J., Caldwell, N. H., & Sarhan, A. M. (2007). Equipping designers by simulating the effects of visual and hearing impairments. In *Proceedings of the 9th international ACM SIGACCESS conference on computers and accessibility* (pp. 241–242). ACM.
- IBM. (2014). *IBM SPSS Software*. Retrieved from. <http://www-01.ibm.com/software/uk/analytics/spss/>.
- Keates, S., Clarkson, P. J., & Robinson, P. (2002). Developing a practical inclusive interface design approach. *Interacting with Computers*, 14(4), 271–299.
- Kenagy, J. W., & Stein, G. C. (2001). Naming, labeling, and packaging of pharmaceuticals. *American Journal of Health System Pharmacy*, 58(21), 2033–2040.
- LinkedIn. (2015). LinkedIn. Retrieved from. [www.linkedin.com/](http://www.linkedin.com/).
- Maguire, M. (2001). Methods to support human-centred design. *International Journal of Human-computer Studies*, 55(4), 587–634.
- McDonnell, J., & Lloyd, P. (2014). Beyond specification: a study of architect and client interaction. *Design Studies*, 35(4), 327–352.
- Meggs, P. B., & Purvis, A. W. (2011). *Meggs' history of graphic design* (5th ed.). UK: Wiley.
- Othman, A. A., Hassan, T. M., & Pasquire, C. L. (2004). Drivers for dynamic brief development in construction. *Engineering, Construction and Architectural Management*, 11(4), 248–258.
- Paton, B., & Dorst, K. (2011). Briefing and reframing: a situated practice. *Design Studies*, 32(6), 573–587.
- Poulson, D., Ashby, M., & Richardson, S. (1996). *USERfit—A practical handbook on user-centred design for assistive technology*. Brussels, Luxembourg: ECSC–EC–EAEC.
- Preiser, W. F., & Ostroff, E. (Eds.). (2001). *Universal design handbook*. McGraw Hill Professional.
- QSR NVivo. (2013). QSR International NVivo 8. Retrieved from. [www.qsrinternational.com/products\\_previous-products\\_nvivo8.aspx](http://www.qsrinternational.com/products_previous-products_nvivo8.aspx).
- Qualtrics. (2014). Qualtrics survey software. Retrieved from. [www.qualtrics.com/](http://www.qualtrics.com/).
- RNIB. (2006). See it right. Retrieved from. [www.ntu.ac.uk/equality\\_diversity/document\\_uploads/92879.pdf](http://www.ntu.ac.uk/equality_diversity/document_uploads/92879.pdf).
- Robson, C. (2002). *Real world research* (2nd ed.). Blackwell Publishing.
- Schön, D. A. (1988). Designing: rules, types and worlds. *Design Studies* 181–190.
- Stanford University. (2014). Stanford design school: use our methods. Retrieved from. [www.dschool.stanford.edu/use-our-methods/](http://www.dschool.stanford.edu/use-our-methods/).
- Swayne, T. (2005). *Information design for patient safety*. London: Helen Hamlyn Research Centre, Royal College of Art and National Patient Safety Agency.
- Tzortzopoulos, P., Cooper, R., Chan, P., & Kagioglou, M. (2006). Clients' activities at the design front-end. *Design Studies*, 27(6), 657–683.

- Waller, S., Bradley, M., Hosking, I., & Clarkson, P. J. (2015). Making the case for inclusive design. *Applied Ergonomics*, 46(b), 297–303.
- Warburton, N., Desbarats, G., & Hosking, I. (2015). Developing inclusive design expertise within a client/consultancy relationship. *Applied Ergonomics*, 46(b), 274–278.
- Zitkus, E., Langdon, P., & Clarkson, J. (2011). Accessibility evaluation: assistive tools for design activity in product development. In *SIM conference proceedings, Vol 1* (pp. 659–670).
- Zitkus, E., Langdon, P. M., & Clarkson, J. (2013a). A conceptual client-designer framework: inspiring the development of inclusive design interactive techniques. In *Universal access in human-computer interaction. Design methods, tools, and interaction techniques for eInclusion* (pp. 143–152). Berlin Heidelberg: Springer.
- Zitkus, E., Langdon, P., & Clarkson, P. J. (2013b). Inclusive design Advisor: understanding the design practice before developing inclusivity tools. *Journal of Usability Studies*, 8(4), 127–143.