

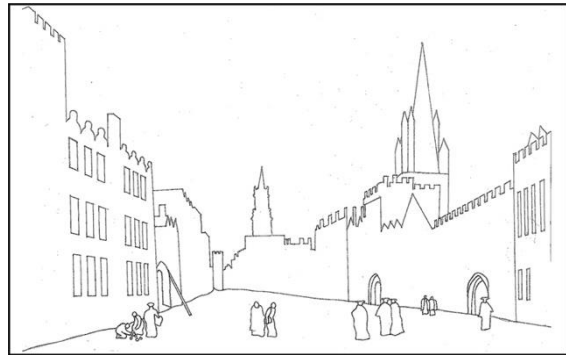
## Appendix 1

### *Research team meeting: Amount of details and texture*

First, the research team discussed and tried out the amount of details in two tactile pictures: one detailed with elements inside the global (shape) outline of the elements [cf. Draft 1 (Figure 2a)], and one simplified with elements inside the global (shape) outline of the elements either simplified or removed, that is, to ensure that these elements did not interfere with the global (shape) outline of the elements (cf. Draft 2). Then, the research team discussed and tried out the amount of texture in three tactile pictures, that is, in the detailed picture with one, two, and three types of texture [cf. Draft 3, 4, 5 (Figure 2b)]. In addition, the research team tried to present some of the elements (referred to in the curator's text) in more detail in a side panel (cf. Draft 6). The research team also discussed how the museum visitors would explore the tactile picture by haptic touch, and whether this differed for outlined and textured pictures.



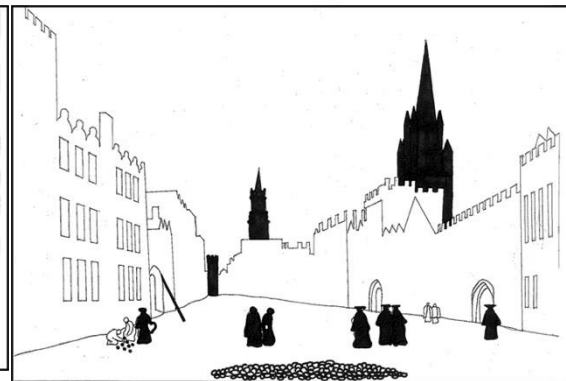
Draft 1 (cf. Figure 2a)



Draft 2



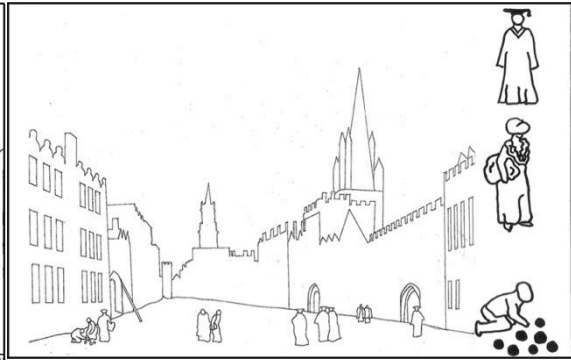
Draft 3



Draft 4



Draft 5 (cf. Figure 2b)



Draft 6

Draft 1 (Figure 2a). Outlined picture – detailed; no texture.

Draft 2. Outlined picture – simplified; no texture.

Draft 3. Textured picture – detailed; one type of texture [i.e., completely filled (spires and tower)].

Draft 4. Textured picture – detailed; two types of texture [i.e., completely filled (spires and scholars) and small circles (cobble)].

Draft 5 (Figure 2b). Textured picture – detailed; three types of texture [i.e., completely filled (scholars), small dots (spires and tower), and medium squares (cobble)].

Draft 6. Outlined picture with detailed elements (i.e., the scholars) in a side panel.

#### *One-on-one sessions 1-6: Amount of details and texture*

##### **Interview guide.** Before exploring the tactile picture:

- 1) Please explain how you are exploring this picture. When exploring it:
  - a. Please tell me how and where you start, and what you do next.
  - b. Please tell/show me everything that attracts your attention, and then describe each thing.
  - c. Please tell/show me what is not interesting – what you are just ‘scanning over’ –, and then explain what makes this uninteresting.
- 2) Is there anything you would like to be more or less detailed? Please tell/show me, and then explain what you would have wanted differently.
  - a. If you wanted more details, would you have wanted them included in the picture itself or in a separate side panel (next to/on the edge of the picture)?

##### After having explored the tactile picture:

- 1) Please tell/show me what was the most important in the picture.
  - a. Please describe it, and then tell me what made this the most important.
- 2) Please tell me when you would have wanted an audio-description, and explain why:

Before exploring the picture by touch/vision	Spread out in the picture	Both before exploring the picture by touch/vision and spread out	Never

- 3) Please explain what you would have used the audio-description for, and explain your answer.

To get an overview of the picture	
To know what to explore by touch/vision	
To get an explanation when things are difficult to understand by touch/vision	
To get an overview + to know what to explore by touch/vision	
To get an overview + to get an explanation when things are difficult to understand by touch/vision	
To get an overview + to know what to explore by touch/vision + to get an explanation when things that are difficult to understand by touch/vision alone	

Repeat this procedure for the second picture.

*Research team meeting: Tactile audio-description trigger points*

The research team discussed whether the symbol for the audio-description trigger points had to (1) be recognisable to all participants, and/or (2) cause the participants to move their fingers repeatedly over the trigger point, to ensure that they do not ‘scan over’ them. Different symbols were tried out:

- The play symbol (triangle), commonly found on CD and DVD players.
- Three dots/braille S, as the tactile pictures were drawn in a continuous line and most lines were straight and/or angular.
- The Orange Tacti-Mark (i.e., an orange-coloured liquid plastic that sets hard).

These were placed either:

- On the element itself.
- To the left of the element.
- On the element; in a circle/square, to make it stand out from any texture.
- To the left of the element; in a circle/square, to make it stand out from any texture.

*Group session 7: Tactile audio-description trigger points*

**Interview guide.**

- 1) Please tell/show me which symbol you prefer, and explain why?
  - a. If this symbol does not work, please tell/show me where and explain why.
- 2) (With the group’s preferred symbol) please tell/show me all the trigger points.
- 3) (For missed audio-description trigger points, show each trigger point to the group, and ask them to) please explain why you think this trigger point is difficult to find.

Repeat this procedure for the second picture. Then, invite the participants to suggest other symbols for the audio-description trigger points.

*Research team meeting: Audio-description ↔ haptic touch ↔ vision*

First, the research team discussed examples of audio-descriptions of exhibitions, theatre plays, and films as well as oral announcements at concerts, train stations, shopping

centres, etc., in relation to background noise, what information they presented, and the tone of voice of the person presenting the information. Then, the research team discussed how the museum visitors might use the audio-description, haptic touch, and/or vision separately and together when exploring multisensory pictures.

*Group session 8: Audio-description ↔ haptic touch ↔ vision*

**Interview guide.**

- 1) Please tell me which voice is:

	Voice 1	Voice 2	Voice 3	Voice 4
Your favourite				
Standing out in a crowd				
Reading too fast				
The most nuanced				
The most charismatic				
Too 'sad'				
Mumbling				
'Eating' half the words				
Reading too slow				
Boring				
The most neutral				
Reading the words clearly				
Reading in a good speed				
Too 'happy'				
The 'curator-voice'				
Sounding 'angry'				
The most monotone				
OK enough				

- 2) Would you accept a synthetic voice for the audio-description? Why/why not?
- 3) If you are using the audio-description to get an overview of the picture, is this similar to what you would have done by vision – first get the overview, then explore the details?
  - a. Please explain what is and what is not similar (when using the audio-description compared to vision).
  - b. Please explain/give examples of what is better and what is worse (when using the audio-description compared to vision).
  - c. Please tell me/give examples of what information, and how much you would like in the overview audio-description.
- 4) If the audio-description tells you what is on the picture:
  - a. Would you still try to recognise everything, for example, all the buildings along the Oxford High Street, or would you just notice them and think that 'this is probably what was mentioned in the audio-description'?
  - b. Would you go straight on to the details (e.g., the windows, the cobbles, the spires, etc. along the Oxford High Street)?
    - i. If you do, what details would you be exploring (e.g., the angles/curves in a line, like those in the Oxford skyline, textures, windows and doors on the buildings, the scholars, etc.)?

- c. Do you look for any particular detail(s) [e.g., shape (angle; curve; line) features and/or textures] in all pictures, regardless of whether or not they are referred to in the audio-description?
  - i. If you do, please tell me what detail(s) and explain why.
  - ii. If you do not, please explain why not.

*Research team meeting: Overview audio-description*

The research team discussed the suggestion of an overview audio-description – what symbol, and where and how to place it. Three dots – the braille O – was suggested and placed in the upper left corner of the tactile picture, to ensure that the museum visitors would find it immediately (before exploring the rest of the tactile picture).

*Group session 9: Overview audio-description*

***Interview guide.***

- 1) Would you like the trigger point for the overview audio-description to have the same or a different symbol than the other (element) trigger points? Why/why not?
  - a. If not, please suggest a symbol.
- 2) Please tell/show me where in the picture you would like the trigger point for the overview audio-description to be placed, and explain why.
- 3) We have suggested both a symbol for the overview audio-description trigger point, and where to place it. Please comment on these suggestions.
- 4) (With all audio-description trigger points in mind) is consistency in where the trigger points are placed necessary, or could the trigger points be placed differently from picture to picture and element to element (i.e., because you would recognise the symbols anyway)? Please explain why/why not.

*Research team meeting: Shape features, textures, and elements*

The research team discussed and tried out the use of texture(s), and also possible ways of altering or even removing shape (angle; curve; line) features and elements. First, the research team tried out the line fineness – fine (1.2 mm) and thick [(2.0 mm) cf. Draft 7 (Figure 4a), 8]. Some elements were difficult to perceive in the thick line, thus the research team tried to exaggerate them (i.e., making the young man's hair and collar more curly) and to add texture [i.e., making the young man's buttons and medal solid shapes) cf. Draft 8]. Second, the research team started altering and even removing some elements (cf. Draft 8), in order to ensure a more clearly defined global (shape) outline of the elements referred to in the curator's text (cf. Appendix 2). The scroll in the table inlay and the cloth were removed even though these elements are referred to in the curator's text (Appendix 2), because they (1) interfered with a clearly defined global (shape) outline of several other elements referred to in the curator's text (e.g., the cloth interfered with the young man's hand, fingers, and jacket skirt), and/or (2) were only possible to perceive as 'some texture' and would be described in the audio-description anyway (cf. Appendix 2; Draft 8)]. The imaginary view, balustrade, and chair ornaments were removed (cf. Draft 9), and the curves in the young man's jacket skirt, hair, and collar exaggerated (cf. Draft 10). Then, the research team took a step back and tried a completely different approach: the research team reinstalled all elements [cf. Draft 7 (Figure 4a)] and added eight different types of texture [cf. Draft 11 (Figure 4b)]. Finally, focusing on the young man, the research team tried exaggerating the straight

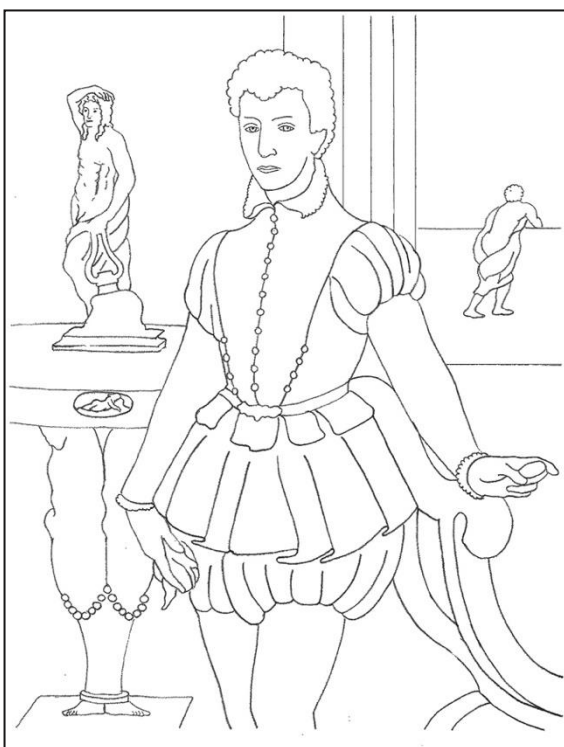
lines so that, for example, the curves in his jacket skirt became more angular, and did this in both a thick (2.0 mm) and a fine (1.2 mm) line (cf. Draft 12, 13 (Figure 4c)).



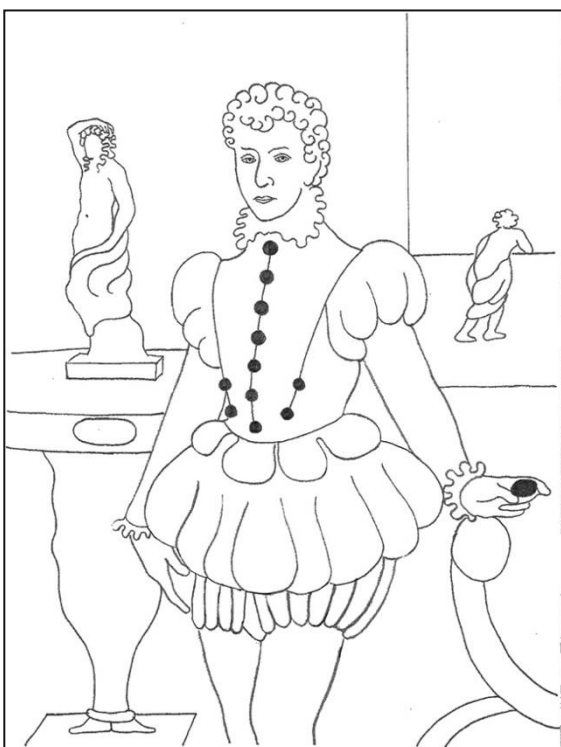
Draft 7 (cf. Figure 4a)



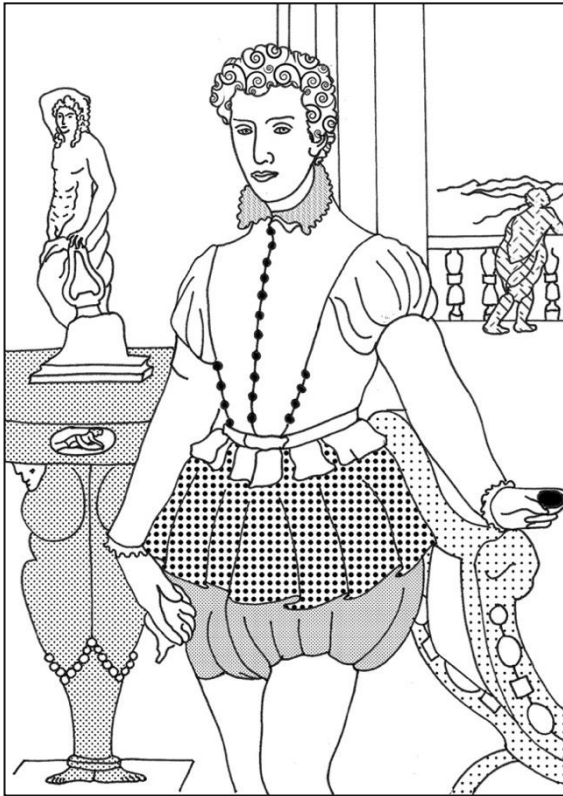
Draft 8



Draft 9



Draft 10



Draft 11 (cf. Figure 4b)



Draft 12



Draft 13 (cf. Figure 4c)

- Draft 7 (Figure 4a). Traced outlined shapes – fine line.
- Draft 8. Traced outlined shapes – both fine and thick line (outlining the young man). Exaggerated elements (more curly hair and collar); added texture [buttons and medal (completely filled)]; removed elements (the details on the Apollo, the background details, the scroll in the table inlay, the details on the pedestal, the cloth, and the chair ornaments).
- Draft 9. Traced outlined shapes – fine line. Focusing on the imaginary view, the figure in classic dress, and the chair; the imaginary view, balustrade, and chair ornaments were removed.
- Draft 10. Traced outlined shapes – fine line. Focusing on the young man, the jacket skirt, curly hair, and curly collar were exaggerated (i.e., made more puffy and more curly).
- Draft 11 (Figure 4b). Traced outlined shapes – fine line. Reinstalled all elements; added texture on the collar (diagonal lines in fishbone-pattern), buttons (completely filled), figure in classic dress (diagonal lines; long and short), table and pedestal (small dots and small circles), jacket skirt (big dots and mini-dots), medal (completely filled), and chair (dots)].
- Draft 12. Traced outlined shapes – thick line. Focusing on the young man, the straight lines and angles in the jacket skirt were exaggerated.
- Draft 13 (Figure 4c). Traced outlined shapes – fine line. Focusing on the young man, the straight lines and angles in the jacket skirt were exaggerated.
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#### *Group session 10: Shape features, textures, and elements*

##### ***Interview guide.***

- 1) Please explore the pictures, and tell/show me:
  - a. Everything that attracts your attention, and then describe each thing.
  - b. Everything that has too much/too little details, and then explain what you would have wanted differently.
- 2) Please focus on the young man, and point out which (one) of the three pictures you prefer. Please explain why.
  - a. If you do not prefer any of them, please explain why.
  - b. Which (one) of the three pictures you like the least? Please explain why.

##### *Research team meeting: Textures and elements*

The research team continued discussing and trying out ways to alter or even remove textures, shape (angle; curve; line) features, and elements following the curator's text (cf. Appendix 2), that is, to ensure that textures and/or elements do not interfere with any global (element shape) outline. With this in mind, the background details behind the young man were removed (cf. Draft 15).

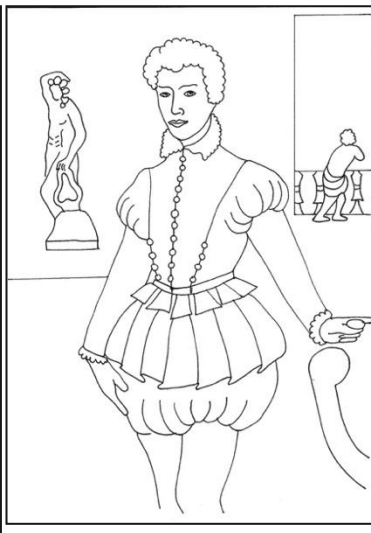
First, focusing on the young man, the research team tried exaggerating the straight lines even more (cf. Draft 14, 15, 16). Second, the research team tried adding and altering representations for the elements that were difficult to perceive: the pedestal was replaced by a straight line (cf. Draft 17) and later by a wavy line (cf. Draft 18), mirroring the global (shape) outline of the pedestal (cf. Draft 14), the balustrade by one baluster (cf. Draft 18) and later by two balusters with more straightened out lines (cf. Draft 19),



Apollo's stand by a box (cf. Draft 19), and the chair ornaments by a series of different angular and curved shapes [cf. Draft 17, 20 (Figure 5)]. Third, to ensure that the museum visitors do not 'scan over' crucial elements and that they do not get confused by how the elements are spaced out or positioned; the research team also tried removing the gap between Apollo's stand and the table (cf. Draft 19), between the frame surrounding the imaginary view and the feet of the figure in classic dress (cf. Draft 18), and between the young man's hand showing the medal and the chair (cf. Draft 18). Finally, the research team discussed and tried out whether certain elements, instead of being altered or even removed, could serve as textures causing the museum visitors to move their fingers repeatedly over them and thus to activate the audio-description, that is, to ensure that the museum visitors do not 'scan over' elements referred to in the curator's text (cf. Appendix 2). An example is the Apollo: instead of being altered, should the Apollo rather be treated as 'a textured something', sparking the museum visitors' curiosity and thus their activation of the audio-description [cf. Appendix 2; Draft 20 (Figure 5)]?



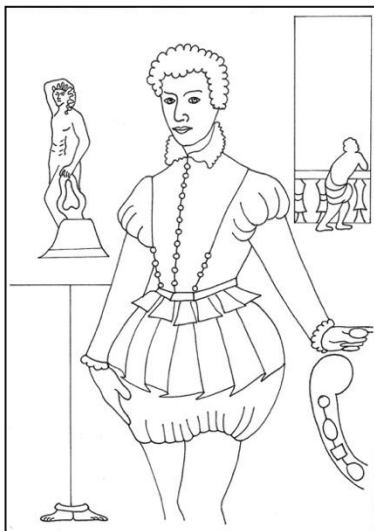
Draft 14



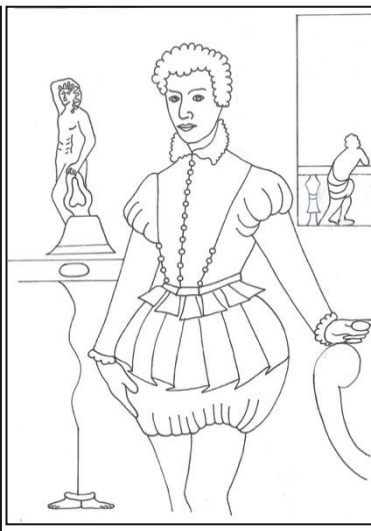
Draft 15



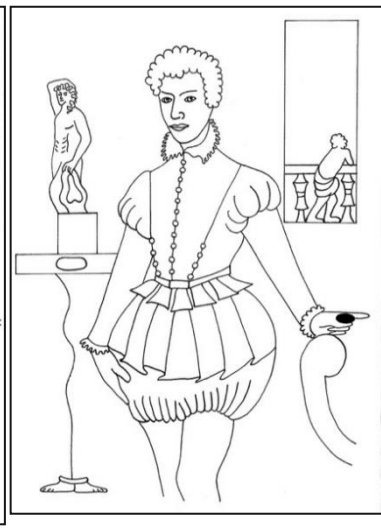
Draft 16



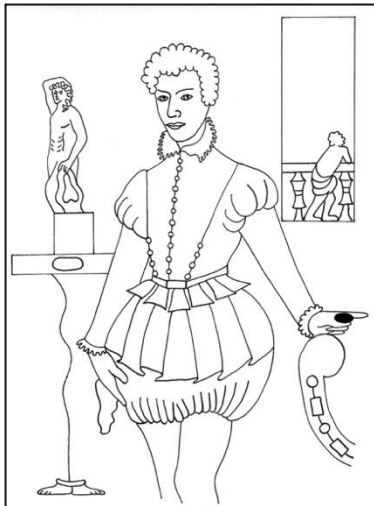
Draft 17



Draft 18



Draft 19



Draft 20 (cf. Figure 5)

- Draft 14. Traced outlined shapes – fine line. Focusing on the young man, the straight lines and angles were exaggerated more.
- Draft 15. Traced outlined shapes – fine line. Focusing on the young man, the straight lines and angles were exaggerated a bit more.
- Draft 16. Traced outlined shapes – fine line. Focusing on the young man, the straight lines and angles were exaggerated even more. The outline of the jacket skirt (on the right hand side) was altered (i.e., into a continuous line).
- Draft 17. Traced outlined shapes – fine line. Added representations for the table, pedestal, and chair ornaments.
- Draft 18. Traced outlined shapes – fine line. Added, altered, reinstalled, and removed representations; that is, for the table, the balustrade, the table inlay (without the scroll inside), the pedestal, and the chair ornament. The frame surrounding the imaginary view and the height of the chair were altered, so that the figure in classic dress stands on the frame and the young man's wrist rests on the chair.
- Draft 19. Traced outlined shapes – fine line. Added and reinstalled representations for Apollo's stand and the baluster. Apollo's stand was placed directly on the table.
- Draft 20 (Figure 5). Traced outlined shapes – fine line. Added representation of the cloth. The representation of the chair ornaments was reinstalled and altered.

### Group session 11: Textures and elements

#### Interview guide.

- 1) Please explore the picture, and tell/show me:
  - a. Everything that attracts your attention, and then describe each thing.
  - b. Everything that has too much or too little details, and then explain what you would have wanted differently.
- 2) Please point out all the elements in the picture that are textured.

#### Observation form.

Apollo		Belt		Buttons		Chair		Cloth		Collar		Face	
Figure in classic dress				Fingers		Hair		Jacket skirt				Medal	
Pedestal feet			Puffs			Table inlay				Other. What?			

*Research team meeting: Audio-description*

The research team discussed the audio-description suggested by the professional audio-describer in collaboration with a Primary School Education Officer and a Senior Curator of European Art at the university museum, especially in relation to amount of information, what visual and tactile information to include, what is descriptive and what is historical information, and how the museum visitors explore the tactile picture.

*Group session 12: Audio-description*

**Interview guide.**

- 1) Please tell me/give an example of what information you would like in the overview audio-description.
- 2) Please tell me/give an example of what information you would like in the element audio-description.
- 3) If you think the presented audio-description was too long/short, please tell me what you would like to cut/add.
- 4) Would you like each trigger point to include layers of audio-description, or is one layer enough? Please explain why.
  - a. If you would like more than one layer, what kind of information would you like in each layer? Please give an example.

*Research team meeting: Audio-description and tactile references*

The research team discussed and tried out adding tactile references in the audio-description, to ensure that the museum visitors would be able to explore by haptic touch what the audio-description was describing. Would it, for example, make sense to include about the medal that ‘In the tactile picture, the medal is filled in as one solid shape – a circle.’ (Appendix 4, thirtieth paragraph, last sentence) rather than just ‘This is a medal in the young man’s hand.’ (Appendix 3, thirtieth paragraph, first sentence), especially when the medal has been filled in in the tactile picture [cf. Draft 20 (Figure 5)]?

*Group session 13: Audio-description and tactile references*

**Interview guide.**

- 1) Please explore the picture and tell me where in the picture you would like some audio-description, and to explain why.
- 2) Would you like the audio-description to include tactile references, for example, the rough texture? Please give examples.
- 3) Please tell me about/show me any elements in the picture that you are just ‘scanning over’, and explain why. Would you have wanted the audio-description to include these ‘scanning-over elements’? Why/why not?
- 4) Some elements in the visual painting have been altered in the tactile picture. The pedestal, for example, is represented by a curved line in the tactile picture: the curves are similar to those in the visual painting. Please tell me what you think about this. Would you like the audio-description to include this information? Why/why not?

*Research team meeting: Placing the audio-description trigger points*

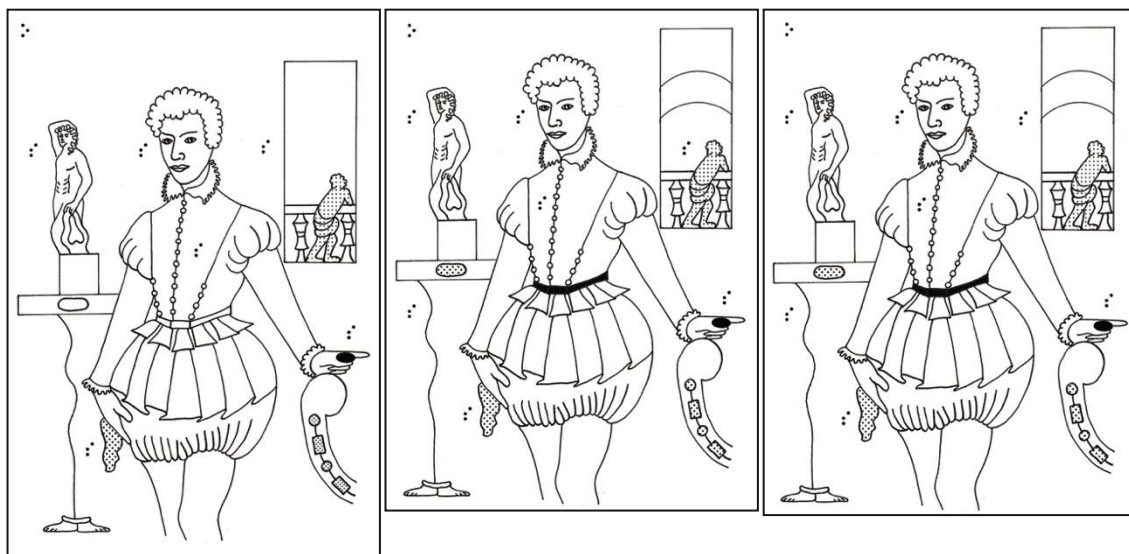
The research team discussed where in relation to the elements the audio-description trigger points should be placed, and also how many trigger points. To create tactile

references and/or to ensure repeated finger movement on certain elements, the research team tried out adding targeted texture; that is, to the figure in classic dress, cloth, chair ornaments [(small dots) cf. Draft 21], and belt [(filled) cf. Draft 22], and reinstalling some element representations, that is, the imaginary view (cf. Draft 22).

Next, the audio-description trigger points were placed according to the curator's text: some elements were combined in one audio-description trigger point; for example, the imaginary view and the figure in classic dress, and others were split; for example, the young man who was split into one trigger point for his head and one for his body (cf. Appendix 2). To ensure that the museum visitors would find the audio-description trigger points immediately, that is, without having to search for them, the research team tried out:

- Six element trigger points, to the left of or above the element (cf. Draft 21).
- Seven element trigger points, one of which was moved to the left on the young man's torso and one of which into the window [just to the left of the figure in classic dress (cf. Draft 22)].
- Seven element trigger points, one of which was moved from the left of the figure in classic dress to the left of the window and the representation of the imaginary view [cf. Draft 23 (Figure 6)].

The audio-description trigger points were placed on horizontal lines as much as possible; for example, to the left of the Apollo, to the left of the young man's head, and to the left of the window and the representation of the imaginary view [cf. Draft 23 (Figure 6)].



Draft 21

Draft 22

Draft 23 (cf. Figure 6)

Draft 21. Added texture to target the figure in classic dress, the cloth, and the chair ornaments (small dots). Six element audio-description trigger points, to the left of or above the element.

Draft 22. Added more texture to target the belt (filled). Two element audio-description trigger points moved: one to the left of the young man's torso and one into the window, just to the left of the figure in classic dress. One element audio-description trigger point added (i.e., to the left of the pedestal).

Draft 23 (cf. Figure 6). One audio-description trigger point moved (from the left of the figure in classic dress to the left of the window and the representation of the imaginary view.

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*One-on-one session 14-15: Placing the audio-description trigger points*

***Interview guide.***

- 1) Please find one of the trigger points – the three dots (braille S or O).
  - a. Please tell me what information you would like from the audio-description.
- 2) Now, let us try the audio-description that we have produced:
  - a. Please, double-tap on the trigger point to start the audio-description (Layer 1). Listen to it, and then please tell me what you were doing?

Continued exploring, and, if so; by touch, vision or both	
Listened to the audio-description – I did not want to explore by touch/vision while listening	
Not sure	

***Observation form.***

What is the participant doing during the audio-description?

Continued exploring by touch/vision	
Listening – no exploring	
Not clear	

***Interview guide.***

- 1) Let us assume you want more audio-description. Please double-tap on the trigger point (Layer 2). Listen to it, and then please tell me what you were doing?

Continued exploring, and, if so; by touch, vision or both	
Listened to the audio-description – I did not want to explore by touch/vision while listening	
Not sure	

***Observation form.***

What is the participant doing during the audio-description?

Continued exploring by touch/vision	
Listening – no exploring	
Not clear	

***Interview guide.***

- 1) Please find another trigger point, and double-tap on it until you get the detailed audio-description. As you listen to the audio-description, please explore by

touch and/or vision what the audio-description is describing. Were you able to explore exactly what was described? Why/why not?

- a. Did you use mainly touch, mainly vision or both?
  - b. If you did not explore/are not sure whether you explored what the audio-description was describing, what would you have wanted differently?
- 2) Please find another trigger point and double-tap on it until you get the detailed audio-description. As you listen to the audio-description, please explore by touch and/or vision what the audio-description is describing. At any point during the audio-description, please pause it – by tapping one time on the trigger point. Please describe how you were able to return to the trigger point in order to pause the audio-description?
- a. Were you using mainly touch, mainly vision or both?

***Observation form.***

- 1) Was the participant able to return to the trigger point?

Did never move away from the trigger point	
Returned to the trigger point fast and accurately	
Returned to the trigger point, but was struggling to find it	
Did not return to the trigger point – could not find it	

*Research team meeting: Audio-description focus and structure*

The research team discussed and tried out different starting points for the audio-description: should, for example, the audio-description say [cf. Draft 23 (Figure 6), the audio-description trigger point just to the left of the young man's head] 'This is the young man who is the subject of this portrait.' (Appendix 3, thirteenth paragraph, first sentence) or 'This is the young man's head. The trigger point is just to the left of his head.' (Appendix 4, thirteenth paragraph, first and second sentence)?

The research team also discussed the structure of the audio-description, and tried out two layers of information:

- Layer 1 – brief description, for example, 'This is a white cloth held in the young man's right hand. The trigger point is just to the left of the cloth. In the tactile picture, the cloth is textured' (Appendix 4, third last paragraph, first, second, and third sentence). [Cf. Draft 23 (Figure 6)].
- Layer 2 – detailed description, for example, 'The young man is holding the cloth with the forefinger and thumb extended to show long elegant fingers. The way the young man stands, with the cloth bunched in his hand, is intended to suggest he has been caught in the act of polishing the medal that he holds in his left hand. The medal is described separately' (Appendix 4, second last paragraph, first sentence and last paragraph, first and second sentence). [Cf. Draft 23 (Figure 6)].

*Group session 16: Audio-description focus and structure*

***Interview guide.*** Please comment on:

- 1) The amount and type of information in each layer.
- 2) The length of each layer.
- 3) Whether the audio-description was in an easy or difficult language.