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Tactile models: theatre design in your hands

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How can set models support creative access to live performance? These three-dimensional models are often (but not always) produced by designers as part of their thinking process and to communicate with other members of the team. Set models are rich in information about the relative size and position of objects and the way a set transforms over time. As portable, tactile representations of space, they have great potential – so far mostly untapped – to be used alongside audio description.

When exploring a model, the audience is not restricted to what can be perceived within arm's reach. We can go beyond the literal and gain an impression of the vast height of the opera stage or the impact of a monumental wall rotating. Models are especially useful when giving an account of designs that play with scale or evoke landscapes.

For example, Es Devlin's design for *Ugly Lies the Bone* (National Theatre, 2017) was a vast bowl that extended up into the flies of the Lyttelton stage. The curved surface was textured with shoebox-sized blocks representing buildings on city streets, each individually cut and positioned. This surface was overlaid with projections of satellite photographs, giving the impression of looking down on a city from high above. In contrast, the objects on stage were banal: an apartment with a table and sofa, a grocery store represented by a shelving unit and packets of food.

The play moves between the experiences of a grounded, suffering body and the escape into virtual reality, between suburban America and space exploration. While the touch tour could easily locate us in the everyday, the shape and scale of the bowl at full size was impossible to grasp directly by touch. Exploring the model with fingertips could have provided a sensation akin to the visual experience of the astronaut or audience member, that of having the city in your hands.

Another performance that brought the domestic and the planetary dimensions together was *Going Dark* (Sound and Fury, 2012). During the performance, constellations were projected on the four walls and ceiling of the studio theatre. For the touch tour, the company borrowed tactile models created by astronomer Steve Owens and artist Alexander Dobbie for their project Touch the Sky. The dots of light that would later appear on the walls and ceiling were represented by bumps on a half-sphere that could be held on the lap, like an upside-down mixing bowl. Tom Espiner, co-director of *Going Dark*, talked participants around the model of the night sky, inviting everyone to begin by putting their finger on the North Star, the largest bump at the highest point of the bowl.

This kind of narration is essential when using a model for access. Although reading a three-dimensional model is easier than reading an architectural drawing, a set model is not self-explanatory. At a backstage model showing, a designer or production manager uses the scale model to explain to colleagues – carpenters, scenic artists, riggers – how the set will unfold through the performance. They set up the model figures and furniture as needed for each scene, and answer questions from the assembled company about materials, magic tricks, trucks and flats, scene changes and sight lines. They give the journey around the set a meaningful structure, just as audio describers do when writing their introduction or planning a touch tour.

Graeae, and the six regional theatres that are part of the Ramps on the Moon consortium make set models available in the front of house area before every performance. But audience members are often diffident about touching a model. This may be due to uncertainty about who is allowed to touch it, or because it's perceived as fragile. Traditional set models can be fiddly (at 1:25 scale, a doorway is about 8cm tall) and delicate (made of relatively cheap materials like cardboard, they are not intended to last beyond the life of the production). More importantly, without a guiding narrative, it's hard to know what is significant. The value of these models as access tools would be increased enormously by briefing an usher or member of the stage management team to invite audience members to touch the model, to explain some aspects, and to link the model to samples of materials.

Tactile model made by Tina Bicât for *The Mill* by Ockham's Razor (2011)

An alternative approach is to design a tactile model specifically for access purposes. *The Mill* (2011), by aerial theatre company Ockham's Razor, takes place on a set that evokes the factory age, with wooden wheels, including a large treadmill, ropes and pulleys hanging from a metal frame. Humans both work this complex machine of interlinked parts and are trapped in it, becoming part of the machine.

For the touch tour, designer Tina Bicât created a tactile model of the set using a Meccano-style construction kit. In discussion with me (as the audio describer) and Alex Harvey (performer and head of rigging), she identified the elements and relationships that were hard to put into words or to understand by touch at ground level. The tactile model demonstrated how ropes looped across the frame four metres overhead and how the big wheel could be turned by pulling a rope.

Tactile models can be larger or smaller than traditional design models. They can be made of robust materials that are pleasing to the touch (like acrylic or rubber) or of stage materials (plywood, serge). They don't need to include exactly the same details as the design model – making any model involves the selection of what's important. For some productions, they could even be assembled from a 'kit' of standard elements, sitting within a permanent model box of the performance space.

A 'modelbox' includes walls, doors and openings, and any fixed objects like radiators or ladders that the designer has to work around. While larger theatres keep a store of modelboxes that can be loaned to designers, few smaller venues or younger designers have storage space to keep models. Making modelboxes anew for each show is incredibly wasteful in time and resources, as designer Max Dorey writes here.

Until recently, designers were expected to absorb the cost of making models (materials, assistants, studio rental) within the flat fee offered for a design job. In most cases, designers were given neither time nor budget to create access tools. However, the new Equity agreement signed in February 2020 obliges producers to pay designers for the full costs of modelboxes. This gives new scope for access officers and advocacy organisations like ADA and VocalEyes to encourage producers to commission imaginative tactile models and sturdy, reusable modelboxes, for access and education.

New technology is opening up new possibilities. Most designers now work in digital, sometimes without ever building a physical model, but this makes 3D printing, casting or laser-cutting easy. In the current situation, in which infection control is part of the audience experience, individual models might be desirable but producing heaps of single-use 3D-printed plastic models would be an environmental disaster. However, the materials for 3D printing are not limited to nylon. Individual tactile diagrams and models could be printed in compostable starch or even in chocolate ….

As with all access solutions, the use of models should be adapted to the needs of the production and the audience. In *The Mill*, the way the set was manipulated by the performers was part of the story; in many other productions, the mechanics of scene changes are deliberately made invisible. The cost of producing tactile models could be disproportionate for a show with a short run, but would be reduced by commissioning permanent modelboxes of the theatre spaces. Designers and access teams could decide together which combination of tools would be most appropriate for a particular show: recorded text, live introductions, touch tours, tactile models, samples of materials etc. (At a minimum, the provision of a tactile model should become standard for any long-running show which doesn't allow audience members on stage for the touch tour.)

Using models shouldn't mean putting an unwarranted emphasis on structures, but it could help describers to capture the visual experiences created by designers – transformations, shifts in viewpoint and scale - that are often impossible to describe live, but seem dry and technical if described outside the context of the performance. Bringing those questions into early conversations between directors, designers and producers – *how will blind and partially sighted audience members access this design?* – will help get that balance right.

About the author

Eleanor Margolies is a writer and audio describer. She has a background in puppetry and theatre design, with interests in ecology and the role of the senses in performance. Eleanor has audio described for museums, theatre and dance, and has led architectural tours for Open House London. As a researcher in the Jocelyn Herbert Archive at the National Theatre, she looked at the use of models by theatre designers, curating an exhibition, 'Playing with Scale'. An audio guide and essay about scale models can be found via the exhibition page of the National Theatre's website and an account of an experiment in collaborative description of set models here.

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Photo: James Bellorini

Set model designed by Geoffrey Scott
for Seán O'Casey's *The Plough and the Stars (*Olivier Theatre, 1977),
on display at the National Theatre's Playing with Scale exhibition, 2018
(Image courtesy of the National Theatre Archive)