

DTM Podcast #3: Design Fixation

Show Notes

Nathan Crilly has written a lot about the phenomena of design fixation that is discussed in the podcast. Two very recent publications of his, in volume 64 of the journal *Design Studies*, are a good place to start. One is of [case studies of creative discovery](#), and the other summarises [the theory of design fixation to date](#). The key early work Nathan refers to – [Design Fixation](#) – that first identified the design fixation phenomena in 1991, is by David Jansson and Stephen Smith.

The [Six Hats Method](#) is a method, devised by the famous creative guru Edward de Bono in his 1985 book *Six Thinking Hats: An Essential Approach to Business Management*, which helps people to think in different ways about a problem. Each hat represents a thinking style – for example ‘gut reaction’, ‘opinions of others’, ‘planning and objectives’ – that you adopt for a fixed period to make progress in a complex problem-solving process.

Project Implicit is an international collaboration between researchers who are interested in implicit social cognition - thoughts and feelings outside of conscious awareness and control. The goal is to educate the public about hidden biases and to provide a “virtual laboratory” for collecting data on the Internet. You can take an ‘implicit association test’ to see where your biases might lie at the following link: <https://implicit.harvard.edu/implicit/takeatest.html>

The 2011 book [Thinking Fast and Slow](#) by Daniel Kahneman summarises the work of two key psychologists – Kahneman and his long-time collaborator Amos Tversky – who have spent their careers looking at the many different ways that human decision-making can be biased, and the poor outcomes that result. Their work has been hugely influential in many areas, including ‘nudge’ theory.

Podcast Transcript

Introduction

Peter Lloyd: Hello, it's Peter Lloyd here. I hope you're enjoying the DTM course so far, I've talked to a few of you and it certainly seems like it - do let us know what you think. This is the 3rd DTM podcast and the subject that we're going to talk about is what's called Design Fixation, a form of psychological bias that can affect designers when they design.

The podcast features Dr Nathan Crilly from the University of Cambridge in the UK who has researched and written a lot about design fixation so I'll let him explain it far better than I could.

First of all, we're going to hear an interview I did with Nathan for about 15 minutes followed by a 10 minute discussion between Mieke and myself about what he said. So it's not a long podcast but it is packed with detail and I should warn you that Nathan is quite a fast talker so look at the transcription in the show notes if you miss what he says. Anyway I hope you find it interesting and here we go...

Part 1: Interview

Peter Lloyd: I'm here in the studio with Dr. Nathan Crilly, who is a researcher from the University of Cambridge in the U.K. and he is a one of the world experts on a phenomena called design fixation, which is a cognitive bias which affects human behavior and therefore all designers. Welcome to the DTM podcast Nathan.

Nathan Crilly: Thanks for having me.

Peter Lloyd: Can you give me an example, first off, of what design fixation is and how will it affect designers when they design?

Nathan Crilly: Sure. So design fixation is generally described as an instance where a designer is trying to be creative, trying to come up with new ideas, but in fact their previous knowledge and their experience and things they've seen are restricting their imagination. So instead of exploring as widely as they could, they're remaining a little bit limited. So if we thinking of an example being here in Delft. So if you were asked to design a new type of bicycle storage facility and you're sketching ideas and you're trying to come up with new ways you could do it. There's a good chance your ideas will be influenced by all the bicycle storage facilities you've already seen, such as the ones at Delft train station or outside TU Delft. So you're trying to come up with new ideas, but you already know all this stuff. You have these expectations as to what bicycles are, how they should be stored, how people use them, and whilst you're trying to think broadly you might find that certain features of pre-existing solutions keep recurring. And that's that's great if the solutions are good, maybe it doesn't matter too much. But it could be they're not very useful or not very useful for your new idea. And yet those ideas just sort of stick around. So design fixation is often described in that way, you want to come up with something new, but your imagination is being inhibited by the precedent that you've seen or the knowledge and experience you've got.

Peter Lloyd: So we don't start from a blank page. The page already has a few things on it that we either get rid of or try and find our way around?

Nathan Crilly: Whilst experience and knowledge is generally thought of as a good thing - the more experience you have then the more expert you are - generally expertise is a double edged sword so it can enable very skilled performance within your area of expertise, but it can restrict your ability to think of things outside that area of expertise. A lot of the studies of expertise look at that conflict: when expertise is good and when not. So if you're a designer, you might be expert in all sorts of products, you might be expert in your own work. And that's useful because you can use that prior knowledge, but it also might have a restricting effect as well.

Peter Lloyd: So even if you're experienced, you can suffer from design fixation?

Nathan Crilly: Yes, so in the work that we've done, especially when we speak to expert designers, one of the things that they've learnt to recognize over the years is recognize their own susceptibility to fixation

Peter Lloyd: Getting hung up on an idea that you can't get rid of?

Nathan Crilly: Yeah, you don't recognize you're hung up on it, which is the big problem. You tend not to be aware of fixation. You tend to be excited by the idea you have and you think it's good and you keep developing it, and all the time you think you are exploring different options, but in fact you're staying on a narrow path. And a lot of the time that's very helpful. You don't want to necessarily question everything all the time. And often in commercial work, you're not being paid to endlessly think about all the different options for how you can interpret the brief or how the different product options or whether it should be a service rather than a product. You can explore some of that to some extent. But the client, if you have an external client, won't just pay you for endless exploration. And so it can be very adaptive and productive and efficient to operate in a somewhat restricted way. And the problem comes when it's not adaptive.

Peter Lloyd: So is there a theory of design fixation? How does it relate to other other work? It sounds like psychological phenomenon?

Nathan Crilly: Design fixation is an instance of a much more general set of phenomena which are called cognitive biases. And these are a large set of biases where what you see as a systematic, as in a reliable and reproducible form of behavior, so a systematic form of behavior where people don't perform entirely rationally, where the information that they are considering in the decisions they may make are biased in a particular way. And so this is cognitive biases research that has been going on for decades that has tended to focus on relatively narrow aspects of decision making. So you have to choose one thing over another or you have to estimate a number. I think the interesting thing that design fixation research adds to that is it looks so much more open ended problems. So biases in creative work rather than just biases in decision making. And of course in professional practice, in design, both of those are relevant. You have to make decisions that are binary decisions, for example, but you also have to explore the

problems and solutions you're working on. There is a thing called satisfaction of search, so once you're looking for something, when you find it, you're very satisfied and you might not search for something else. You might see that in airport baggage handling. Once they find the knife, they don't see the bomb. Or you see it in X-ray scanning on multiple fractures. If they find one break in the bone and they miss the other one because they were just looking for something and when they found it, they felt the search was over. There's lots of different categories of bias.

Peter Lloyd: So as a practicing designer, you can imagine, I think we've all been through this process where you're in a sort of creative mindset and you sort of think "yes it's all fitting together really well, I've got the solution kind of thing, but that can be a dangerous position to be in as well as as a good position.

Nathan Crilly: Yeah I think that's likely to be, there's at least two variants of this. One is that you're going to get fixated, if you're looking at solution fixations, you're fixating on an existing solution. It could be that it's someone else's solution or it could be your solution. And it seems that there's more risk you'll get fixated on your own solution than on someone else's. Design fixation is normally described in terms of an individual designer or a small group of designers being fixated on what they're working on. In fact, designers in professional practice, they have to manage other people. There might be someone else who's fixated, even if they're not. Or it might be the client arrives and the client is already fixated on their interpretation of the problem or their solutions they think are most likely to work. Or it could be you present a product to the market, and the market, or the customers, are already fixated on their idea of what that product should be. So understanding fixation doesn't just influence your own creative practice, but can influence the way in which you try to interact with other people who might whose own fixation might influence your work or might influence its reception. So there are a couple of theories that are relevant to design fixation. One is psychological ownership that when you develop an idea, you feel you have ownership over it and you protect it like one of your possessions, you want to defend it and some of the creative methods, the six hats method, for example, tries to get around that. So there's psychological ownership where we develop an idea, you're very attached to it, sometimes that's also referred to as the IKEA effect

Peter Lloyd: The IKEA effect?

Nathan Crilly: The IKEA effect as in once you've made something yourself it means more to you.

Peter Lloyd: Oh, I see, yeah.

Nathan Crilly: The other thing is the sunk cost effect. So once time, energy, resources have been sunk into an investment, and that could be an investment of developing an idea or financial investment, it doesn't really matter, you tend to make your decisions about the future based on the past, based on previous investments, even though they're not relevant to what you might do in the future. So design fixation is explained by both of those ideas in different ways. So a design individual or a design team working through a project have already sunk various costs into that idea, and they also might have ownership over that idea. And those two factors in combination mean that you might be implicitly very defensive of it and might not even recognize the alternatives.

Peter Lloyd: Yes

Nathan Crilly: In this conversation we've focused on solution fixation, so you come up with a good solution to the problem and you get fixated on that. But you can also think about problem fixation where your interpretation of the problem is limiting in itself and you might think about problem reframing, which is a way of de-fixating from your problem interpretation. And you can think of process fixation, as well, where you have a certain way of working through a design process and you could be fixated on that process.

Peter Lloyd: But to some degree, you can't help, I mean, you have to have some solid ground in your process. You can't help being fixated, it's almost like fixation is a way of holding yourself firm while you explore the the area around you somehow. But those those places where you hold yourself need questioning and need changing from time to time.

Nathan Crilly: Yeah, like I said, this is adaptive. So if we were always questioning what the problem really is, what the process is to solve it and what the solution might look like, then we wouldn't make much progress. But it's a matter of if those things just stay fixed forever, then all sorts of creative options are not being explored.

Peter Lloyd: So there's a balance there. I suppose there's a recognition that as people we have these biases inbuilt that can benefit us because they help us progress in something, but they can also hinder us.

Nathan Crilly: A lot of the design, creativity, methods and design methods more generally can be seen as ways to overcome or manage design fixation. So you can look at the various rules that are applied to brainstorming sessions. They're really, although they're not always framed this way, they're a useful way to challenge design fixation and the same with systematic methods of exploring problems, exploring solutions and documenting those explorations. For example, morphological charts. You can speak to professional designers who say it's a good way of systematically changing that 'yes, I've already understood that that's an idea I'd better move on to the next one. Designers use lots of tools in their work. It could be that they use sketching or they use CAD tools or it could be they use something like, yes, morphological charts or something else. There's various tools and techniques you can use. But one of the main tools the designers are using, especially during the more creative aspects of projects, is they're using their own mind. And in the same way that understanding the strengths and weaknesses of various tools is useful when you're deciding whether to sketch something or use a CAD tool. It's also useful to understand the strengths and weaknesses of your own mind and your own instinct, so a lot of the work on cognitive biases and design fixation reveal very clearly to us what the mind might sometimes be inclined to do. For example, to fixate on.

Peter Lloyd: How we deceive ourselves in certain certain ways.

Nathan Crilly: Yes, so that deception applies across all aspects of human behavior. If you know that the cognitive tools that you're using are, and the processes that you might be involved in, are biased and are subject to various weaknesses, then you can use the other tools that are available to complement that. So in the same way that you

might do some sketching to show a rough sketch to a client so they don't get hung up on the details of a CAD model and you as a designer might choose when to move between sketching and CAD. You also might choose when to move between brainstorming and morphological charts because you know the strengths of one and the weaknesses of the other. And all of those are to try to manage the deficiencies of the way that people think. You could use those creative tools, but you could also try and reflect on your own previous experiences as a designer, try and recognize in retrospect, the times when you might have been fixated and the costs of that and the avenues you didn't explore. And then try and use that to improve your performance in the future. So it's become more aware, more literate in your own propensity for fixation. And, through reflection, challenge that in the future.

Peter Lloyd: So it's about raising awareness and be able to reflect on yourself.

Nathan Crilly: There's various aspects of of bias training where one of the stages is to try and reveal the individual's susceptibility to bias. I mean, one of the cognitive biases is called the bias bias where we're biased to think that other people are more biased than we are!

Peter Lloyd: And there's also unconscious bias too, equal opportunities for male, female, different ethnicities, that you're unconsciously more biased towards certain populations than others. And the fact is, of course, you're obviously not aware of it, but when it's pointed out, then you can change your behaviour. You can build in specific mechanisms that stop that happening.

Nathan Crilly: Unconscious bias seems to be the name that's been given to those set of social and the demographic forms of bias we might have.

Peter Lloyd: But that might that might mean in a participatory process where you're thinking of which stakeholders can be involved in this process, you're using a method that says, you know, go and go get specific user groups to come in or engage with different types of people in the design process they're going to tell you different things. Could the way that you select those people be another form of fixation in the design process?

Nathan Crilly: So anywhere where you might be making decisions about people so it could be hiring, it could be interacting with the client, it could be hiring members of a team. Then you'd expect what's commonly referred to as unconscious bias to play a role just as it does in other hiring decisions in other organizations. So there's a thing called Project Implicit run by Harvard, where anyone can go online and they can participate in these online studies that will give them some feedback on what their apparent level of unconscious bias is for, male female, for example, or racial groups, age. The idea is that by getting feedback on the fact that you individually may exhibit one of these biases, you can reflect on that use as a form of self-training.

Peter Lloyd: Speaking as a designer I know that design fixation exists, how can I avoid getting fixation? What would be the things that I would do to stop being fixated?

Nathan Crilly: So I think there are probably three different approaches you could take. One is you could use the various design and ideation and creativity tools that are available. So put them all into one set, and you can use those tools. The other one is you can try and either form diverse groups or bring in external perspectives and people who might challenge what you're doing. There are some nice examples where a group is working on something and someone else comes in and questions "why are you doing that?" And it's because they're from a different background, they're a physicist or a chemist or a social scientist or something, and they just have a very different perspective on things. And then the third one, which seems to be in some ways conflicting advice, is either stick with it and keep working on it and work against your own biases, or take a break from it and do something else and give it some time to disappear. I think on that last point, it's either if you're freshly fixated on something it's good to take a break from it. But if you're working on something for a long time, it might be the need to really just knuckle down and keep going to challenge that fixation rather than taking a break because you've taken plenty of breaks already.

Peter Lloyd: So where should people interested in exploring design fixation a little bit more, Where would you recommend they go to?

Nathan Crilly: I think cognitive biases in general are interesting and relevant to design practice, even if it's not the ideation stage. There is a famous book called 'Thinking Fast and Slow' by Daniel Kahneman. Typing in 'types of cognitive bias' or 'categories of cognitive bias' into your preferred search engine will bring up some nice, neat lists that are a lot shorter than that book and will let you identify the types that you think might be relevant to the sorts of work that you do.

Peter Lloyd: Thanks very much. Thanks for talking to us.

Nathan Crilly: Thanks for the chance.

Part 2 Discussion of Interview

Peter: So that was Nathan, He speaks quickly!

Mieke: He speaks very fast! First of all I thought it was really nice that he was here. I think it's one of the good things of working in a university and working at TU Delft is that we've got all these people visiting us, and then sharing all the things that they've learned with us, which is more inspiring than just reading the articles they've been writing.

Peter: When I said he was a world expert, I wasn't underestimating him he really has written a lot about and thought a lot about it. You can tell how coherent he is about it. What was the sort of one thing that you took out?

Mieke: Well, the one thing I have been thinking about is why have I not really looked into fixation before? Even though I'm a design researcher, I'm really interested in designing. Fixation has never really been on my radar. But then I realized that fixation is actually not the same as being stuck in a design process. It's the opposite. It's you know, you're so fixated on something and having a good idea that you don't even think about that anymore, that your mind may be fixated or that you might be biased. And

then I started thinking about, you know, when I could have been times that I was fixated but was not aware of it. And then I started thinking about this, about the podcast we're making, because, you know, this is essentially a design process. We are designing, you know, a course, DTM. And I think quite early on in this process, the idea of creating a podcast came up. It came from you and I thought it was really a good idea. Now we've been sharing that with people, I think in an enthusiastic way. But now I was suddenly thinking, hey...

Peter: Whether there are other ways to do this?

Mieke: Yes. I we maybe a little bit too fixated on podcasts and what would be the way first to find that out, and if we were fixated, what should we do to get kind of beyond this idea of of a podcast?

Peter: Yes, I mean that's where design methods come into play. They force you to think in ways that you wouldn't normally think of. Maybe generating more alternative solutions at the start of the process. I think Nathan makes the point that one of the ways not to be fixated is to get external people looking at what you do, giving them the opportunity for them to make critical comments.

Mieke: So have we done that?

Peter: I think so in the process of making a proposal, showing it to certain people, sending it around, getting feedback on the proposal - you're testing the validity of the idea.

Peter: So we talk to the people here who know all about blended learning, who seem to be excited.

Peter: I think it's also a certain point fixation is about commitment. Once you're committed to something, it's very difficult to leave that commitment. Nathan talked about sunk costs. You're invested in something and then you invested in making it work whatever, you know, ignoring other evidence. Recognizing the beginnings of that process is the key for fixation. I you're in a comfortable process and you feel that

you're getting enough input, I don't think it's something you should be too worried about but I think it's just a phenomena that can happen.

Peter: The thing that I took from [what Nathan was saying], the one thing that I liked Nathan saying, was that the mind is a tool. We use these tools in designing, but also your mind is a tool and it has certain limitations and certain advantages and understanding those limitations in using methods or using other techniques to get around those limitations makes for a better design process.

Mieke: So we don't always need a morphological scheme or a brainstorm session, we can use our minds as well as a tool. And if we would not have fixation, that would also not be good because then we would never commit to anything. That's the other thing is, cognitive biases have advantages and they also have disadvantages. So it's good to be fixated to a certain degree, you know, to frame a problem in a certain way and to go as far as you can with that. But then the disadvantage with that is if it lasts too long, and you get fixated on something that's not going to work in the end, then...

Mieke: I did go to the website that Nathan mentioned, Project Implicit, the Harvard study, to see what my cognitive bias was. You have to choose a test, so I looked at the test for if you have any cognitive bias in terms of if you relate mental illness to danger.

Peter: Do you mean mental health means that you might be in more danger or?

Mieke: No, this is actually about mentally ill people. So if if you meet someone who is mentally ill...

Peter: That they're more dangerous?

Mieke: If they are more dangerous or not, yes. So very sensitive topic. There are lots of tests like that, you know, related to race or to gender, and all those kind of biases that we really don't want to have. But, you know, there are all these signs that show that you do have [these biases]. So there are these specific tests that can test you on this particular type of bias, but I was wondering if there was maybe also a test that can test

your level of fixation in a design process? Is that possible or is it just really depending on the design process you're in?

Peter: I think there is research that attempts to do that. How useful it is I'm not sure! I think it's much more about being aware that there are possible effects and not necessarily where you are on the scale.

Mieke: No, it's not like, you know, you go for a job interview as a designer and you know, you have to take the test first to check if you're not too prone to fixation!

Peter: Exactly, I think a lot of it is the environment related, there are a lot of situations where you might or might not be fixated. I think the original paper that the Nathan mentioned was basically about showing people an image and then getting them to design something and that image reappearing. So they'd seen something and they they couldn't get it out of their heads when they were designing something. So that's a very specific situation. And although it must apply in other in other situations, too, I think having a single measure is just simplifying things a little bit too much.

Mieke: Yeah, and also not useful like you say. I think the most important thing we learn from this is what we can do about fixation. How can we become more aware of our potential fixation? And then if we are aware, what we what can we do about it?

Peter: And I guess trying new methods. Trying new things, in the process, helps you to explore things that you might not have thought of exploring. So trying a new method, I mean Nathan mentioned taking a break, but I think just trying something different for a while gets you out of a habit of, a way of thinking. So I think that also helps.