

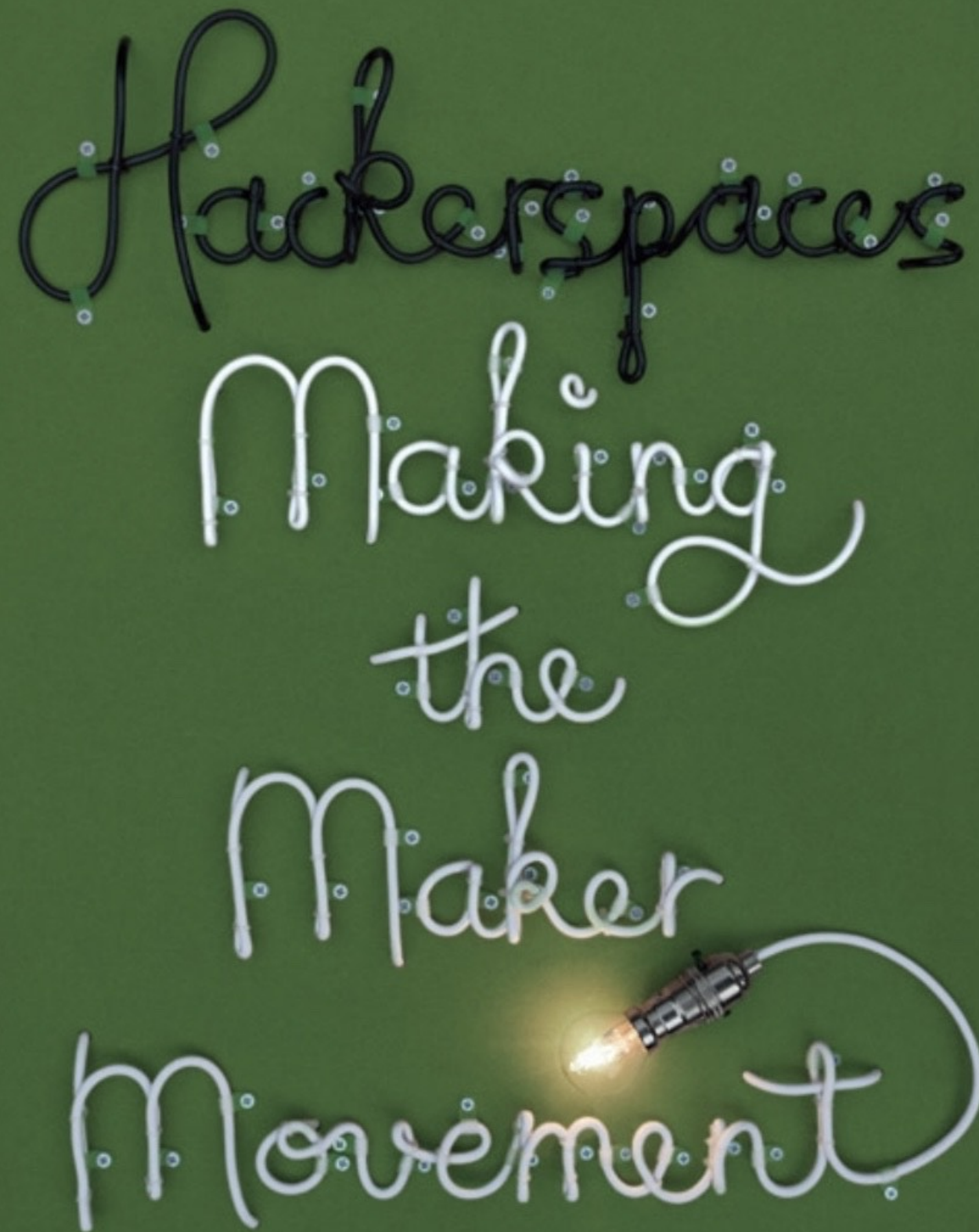
reading-game

pilot for developing gap-games in edgelands

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SARAH R. DAVIES



#02—MDE 504

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Norman Potter (NP)

Potter, Norman. (1991). *Models and constructs : margin notes to a design culture*. Hyphen press. — cf, [APA6th](#) style (English: top right).

Precepts of the literalist movement (Potter, 1990, p.90)—selected passage:

1. Begin at the beginning; a fresh start
2. Seek always the resident principles (corona)
3. Find them where they belong—in the job itself
4. Expose the elements
5. Imply the components
6. Propose discourse
7. Be clear full spare consistent and sufficient
8. Take pains
9. Ask questions
10. Affirm contingently
11. Contingency respects situations [a must? NP]
12. Equate means, constraints, opportunity, response
13. Refer always and at all levels
14. Reach out—nothing to be self-contained
15. Be functional—all parts must work for their living
16. Be just, and let justice be seen to be done
17. Be taut but not tight; the work must breathe
18. Be literal; there must be nothing else
19. 'It was so; I was there, and I saw it'
20. Make, do, go; scorn to publish: encounter!

0. Start always at zero. The facts. Concern, response, enquiry. The place and the situation. The means. Contingent affirmations in a world without precedent. Anonymity. Particularity. No truck with taste, style, eclecticism, magazines, picture books. Universals: number, relation, geometry, sense-data.

The Modern Movement starts with zero!

KHIO

[try again]

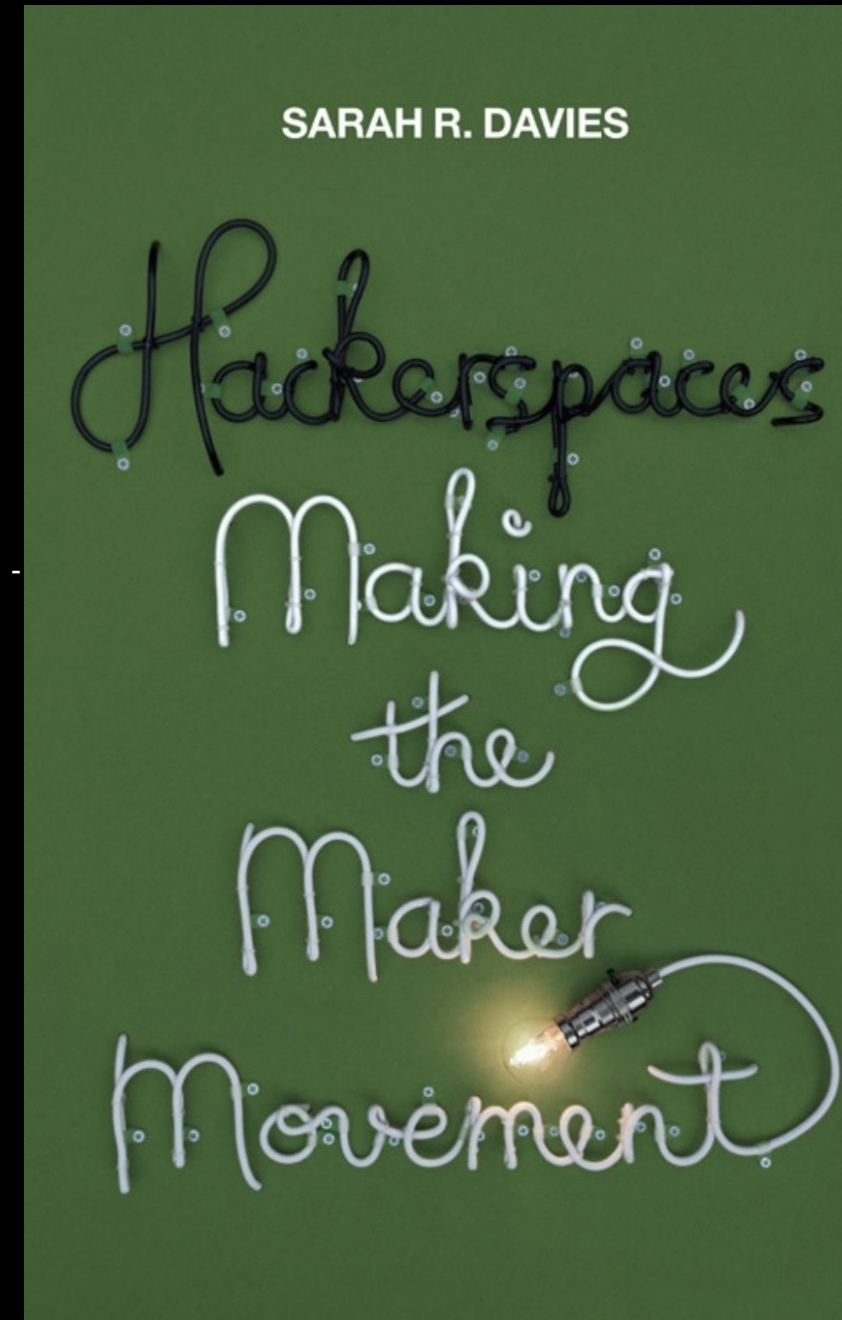
18.09.2020

OBLIQUE STRATEGIES

tap, shake or swipe

CARDS
(enter)

draw



TRIANGULATION

dice

0

PRECEPTS
(exit)

RULES

of the reading-game

- REFLECTION: the precepts 1-10 and 11-20 will be *coiled/folded* on each other
- RANDOM: the pages in the book will be selected by a throw of dice and matched with Norman Potter's *Modern literalist precepts* (1-20)
- REDUNDANCY: for each selected page, a draw is done from the *Oblique strategies deck* (Eno/Schmidt). Each page is matched with *one* card
- RECURRENCE: the card indicates an attitude to the page (ENTER) that will must be used to return to the precept with which the page is matched (EXIT)
- RANGE: all pairs are *ordered* (i.e., *vectors*)—a 2nd term *U* is always a precisation of a 1st term *T*
- ROTATION: the book is assumed to rotate around a core, and the core located somewhere between the beginning and the end (it is located by a WALK and Talk through the book)

- REFLECTION: the precepts 1-10 and 11-20 will be *coiled/folded* on each other



11. Contingency respects situations [a must? NP]	12. Equate means, constraints, opportunity, response	13. Refer always and at all levels	14. Reach out—nothing to be self-contained	15. Be functional—all parts must work for their living	16. Be just, and let justice be seen to be done	17. Be taut but not tight; the work must breathe	18. Be literal; there must be nothing else	19. 'It was so; I was there, and I saw it'	20. Make, do, go; scorn to publish: encounter!
11	12	13	14	15	16	17	18	19	20
10	9	8	7	6	5	4	3	2	1
10. Affirm contingently	9. Ask questions	8. Take pains	7. Be clear full spare consistent and sufficient	6. Propose discourse	5. Imply the components	4. Expose the elements	3. Find them where they belong—in the job itself	2. Seek always the resident principles (corona)	1. Begin at the beginning; a fresh start

- RANDOM: the pages in the book will be *selected by a throw of dice* and matched with Norman Potter's *Modern literalist precepts* (1-20)



**n
t
h
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o
w
i
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g
d
i
c
e**

7	15	16	18	13	1	10	5	3	1
11	12	13	14	15	16	17	18	19	20
10	9	8	7	6	5	4	3	2	1
14	16	10	14	9	2	16	9	20	6

$$\text{SUM } \mathbf{n} = 204$$

Kindle 4648 locations = 424pages

$$\text{SUM } (\mathbf{n} + 6) = 411 \text{ pages}$$

(which is fair distribution)

- REDUNDANCY: for each selected page, a draw is done from the *oblique strategies deck* (Eno/Schmidt). Each page is matched with *one card*

Do the words need changing?

BRIAN ENO / PETER SCHMIDT

In total darkness or in a very large room,
very quietly

Change nothing and continue with
immaculate consistency

Make an exhaustive list of everything you
might do and do the last thing on the list

Remember .those quiet evenings

Don't be frightened of cliches

Disciplined self-indulgence

Don't be afraid of things because they're
easy to do

Cut a vital connection

Where's the edge?
Where does the frame start?

Retrace your steps

Remove ambiguities and convert to
specifics

Don't break the silence

Be dirty

Be less critical more often

Courage!

Don't stress one thing more than another

You are an engineer

Look at the order in which you do things

Remove specifics and convert to
ambiguities

Distorting time

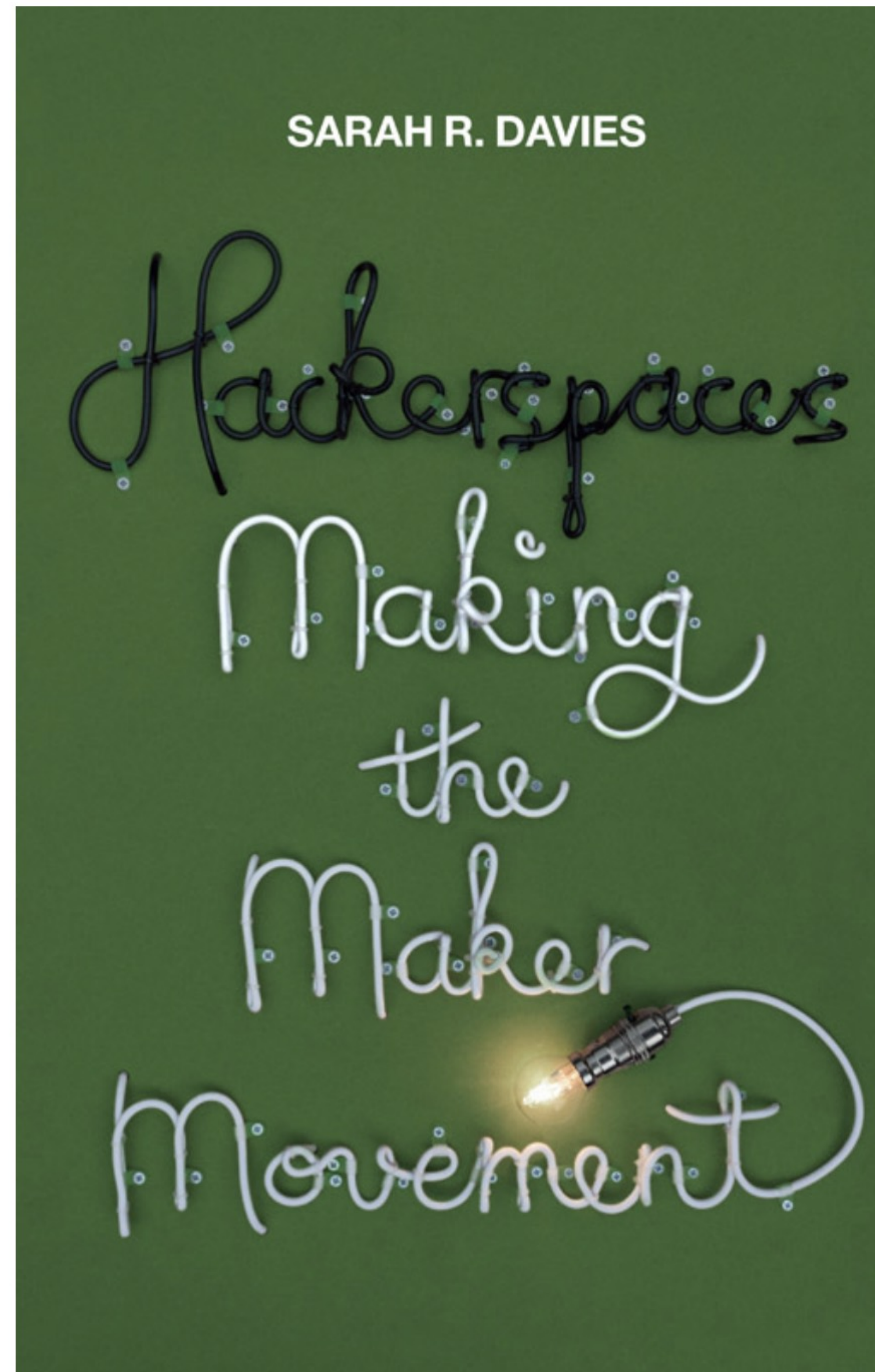
RESOURCE 1
 —what we have... (ENTER)

**c
a
r
d
s**

“Remove ambiguities and convert to specifics”	“Don’t break the silence”	“Be dirty”	“Be less critical more often”	“Courage!”	“Don’t stress one thing more than another”	“You are an engineer”	“Look at the order in which you do things”	“Remove specifics and convert to ambiguities”	“Distorting time”
11	12	13	14	15	16	17	18	19	20
10	9	8	7	6	5	4	3	2	1
“Retrace your steps”	“Where is the edge, where does the frame start?”	“Cut a vital connection”	“Don’t be afraid of things because they are easy to do”	“Disciplined self-indulgence”	“Don’t be frightened of clichés”	“Remember those quiet evenings”	“Make an exhaustive list of everything you might do and to the last thing on	“Change nothing and continue with immaculate consistency”	“In total darkness or in a very large room quietly”

RESOURCE 2—what we have... (EXIT)

11. Contingency respects situations [a must? NP]	12. Equate means, constraints, opportunity, response	13. Refer always and at all levels	14. Reach out—nothing to be self-contained	15. Be functional—all parts must work for their living	16. Be just, and let justice be seen to be done	17. Be taut but not tight; the work must breathe	18. Be literal; there must be nothing else	19. 'It was so; I was there, and I saw it'	20. Make, do, go; scorn to publish: encounter!
11	12	13	14	15	16	17	18	19	20
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10. Affirm contingently	9. Ask questions	8. Take pains	7. Be clear full spare consistent and sufficient	6. Propose discourse	5. Imply the components	4. Expose the elements	3. Find them where they belong—in the job itself	2. Seek always the resident principles (corona)	1. Begin at the beginning; a fresh start



- **RECURRENCE:** the cards indicates an attitude to the page (ENTER) that will must be used to return to the precept with which the page is matched (EXIT)

ENTER

In total darkness or in a very large room,
very quietly

finished projects these tools are being used to build. You can see anything from beer brewing systems to exquisitely fine jewellery and hacked bikes with glitterballs attached to them. There's more space, so there are more comfy chairs, plus a library of sofas, armchairs and bookshelves in the centre.

WALK & TALK

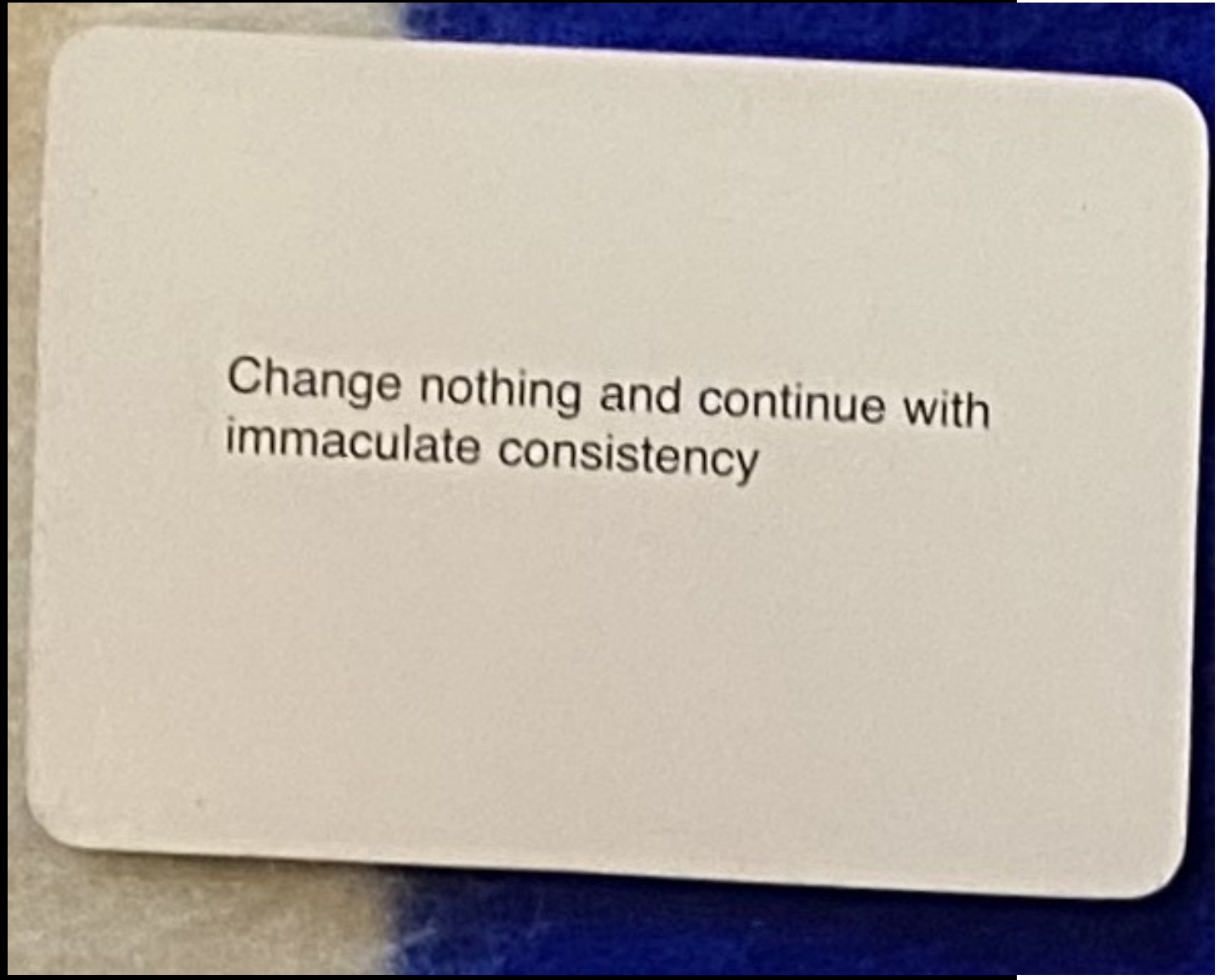
But we might also begin in the media, with the UK's *Guardian* newspaper launching its 'Do Something' campaign in early 2014. This was, as the paper wrote in its 'Do Something Manifesto', an invitation to 'try something new'. Through a monthly magazine, journalists present stories and discussion about easily accessible and low-cost opportunities for readers to try something different. Articles give advice on everything from places to learn how to upholster your furniture to unusual ideas for

a date or whether it's possible to learn Russian in a day; the tone is chatty and friendly, with reader feedback and sections like 'The Do Something Challenge' and Beginner's Guides. The campaign, the Manifesto explains, is motivated by the belief that the experience of novelty adds value to people's lives. Whether it's trying out new things, meeting new people or learning something different, living life such that you accrue new memories and new experiences means that you will live more intensely. If you 'broaden your horizons, learn new skills, or implement more beneficial habits', they suggest, your life will be more satisfying (though also perhaps harder work: the first magazine contains a list of tips on how to meet your goals and stay motivated).

This book is about the connections between

1. Begin at the beginning; a fresh start

EXIT



Change nothing and continue with
immaculate consistency

2. Seek always the resident principles

knitter, but she was regarded with a kind of awed fascination by the rest of the family, as weirdly skilled and dedicated). But suddenly, somewhere in the mid-2000s, knitting was something that young women, living in cities, did by choice. It was a fun, sociable activity: you could join a Stitch 'n' Bitch group, find patterns and community online, and read lively, feminist-inflected how-to guides such as Debbie Stoller's *Stitch 'n Bitch: The Knitter's Handbook*.¹ Friends admired each other's handmade scarves (featuring fashionably chunky yarn or technically impressive designs) and swapped patterns. The rise of cool crafting had begun.

This rise has only continued over the last decade. Skills and techniques that were previously viewed as outdated, unnecessary or

time-consuming to the point of drudgery are being revived and celebrated.² It's not just knitting: sewing and embroidery are currently having a moment, as indicated by the popularity of television shows such as the BBC's Great British Sewing Bee, in which members of the public compete to be named the UK's best home sewer.³ The *Guardian* newspaper's 'Do Something' campaign has featured furniture upholstery as a potential hobby, and describes growing interest in classes in it.⁴ Meanwhile, websites such as Etsy (the online retailer for 'all things handmade') and Folksy (focusing on modern British craft) simultaneously showcase the possibilities of crafting – encouraging visitors to invest in supplies and get creating on their own account

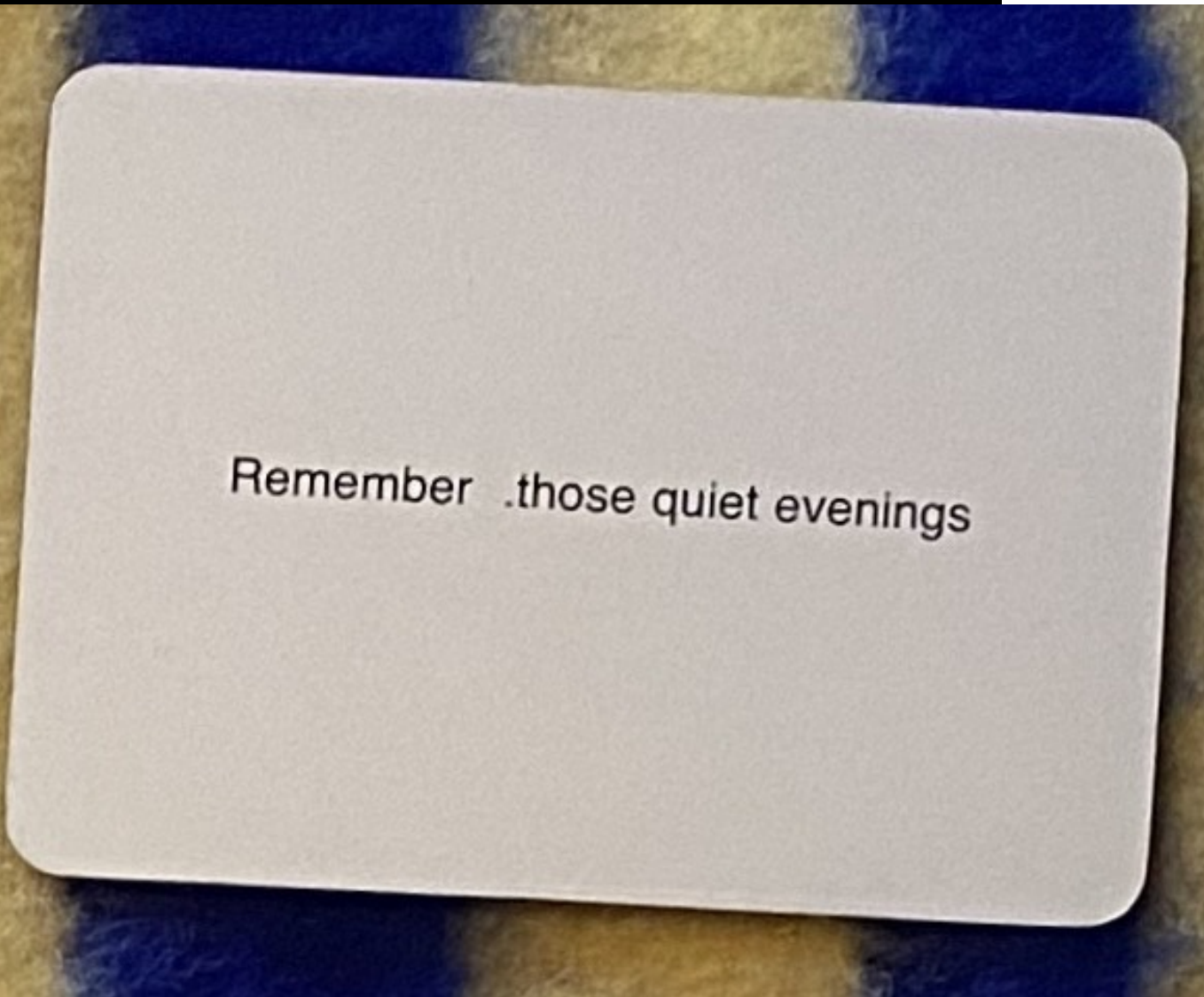
Make an exhaustive list of everything you might do and do the last thing on the list

and repairing his car: 'I feel', he says, 'that if I know how things work, I have more control'.³¹

The irony is, of course, that these efforts to escape the power of markets and bureaucracies are themselves constantly being commodified – with the 'Do Something' campaign being a case in point. However laudable the campaign's aims, and however helpful its tips and suggestions, the *Guardian* is selling itself (boosting sales and circulation) by selling a particular version of its readers. It strokes our egos, entices us with potential lifestyle changes (I've definitely been seduced by visions of myself as a committed aqua-hiker, jam-maker, or successful internet dater), and turns us into ever more committed users of the services the *Guardian* provides. However counter-cultural the thinking behind DIY is, then, it is

constantly being absorbed back into the market and turned into something that can be consumed. TV channels broadcast home renovation shows that allow us to passively consume the DIY vision without doing any of the work. Hobby stores sell products, from kits to tools to materials, designed for crafters and DIY-ers, often with marketing and branding targeted at this type of consumer. And online retailers such as Etsy allow people to purchase 'artisan' products, and thus buy into the lifestyle of the crafter, while simultaneously boosting capitalist markets (Etsy is a for-profit business). One scholar of DIY distinguishes between 'pro-active' and 're-active' forms of DIY, the latter involving 'activities mediated through the agency of kits, templates or patterns and involving the assembly of

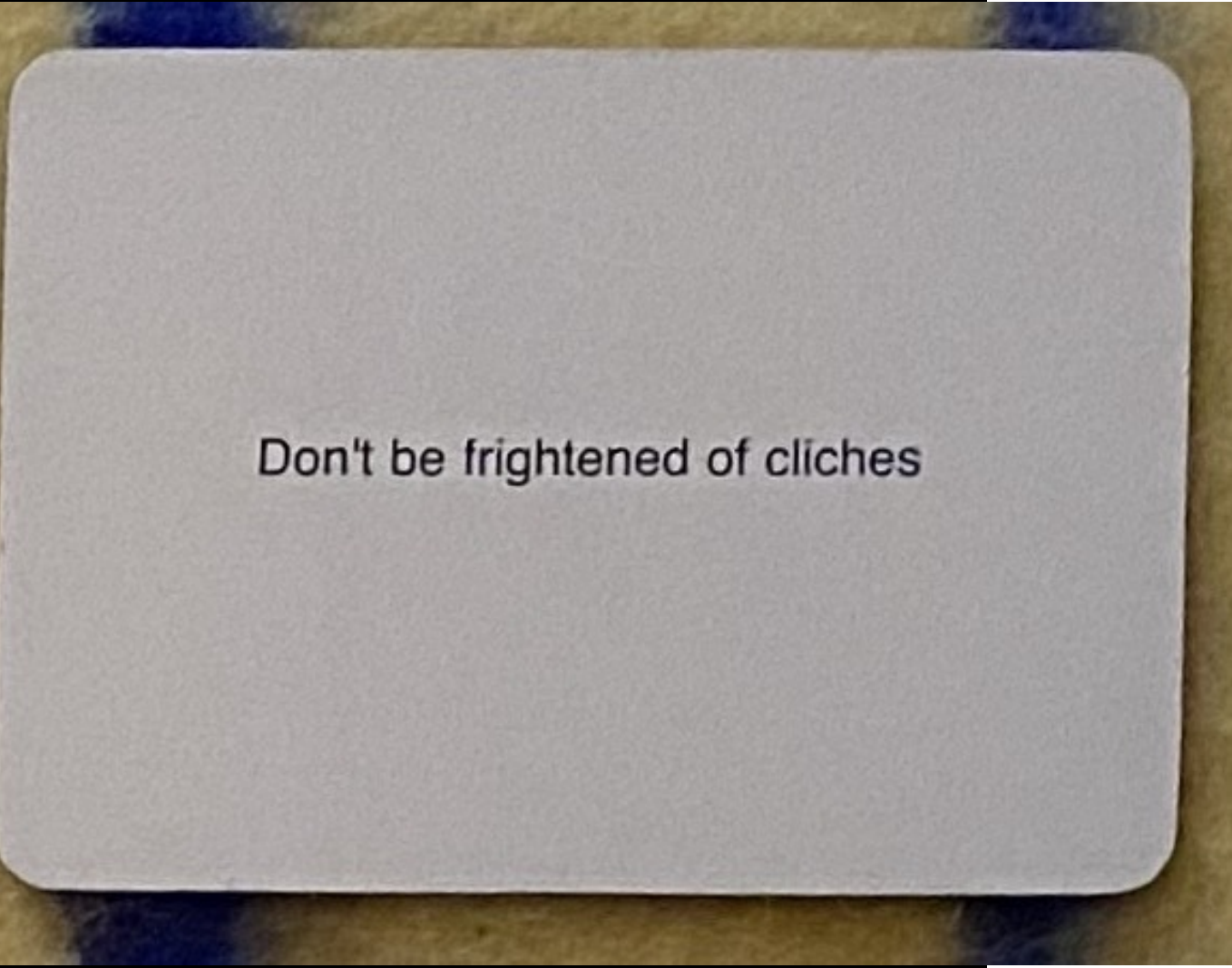
3. Find them where they belong—in the job itself



Remember .those quiet evenings

Makerspaces often have a similarly generous definition of what can go on inside them. It is, however, much harder to trace a specific history to makerspaces. There's no clearly defined origin story, as there is with 'Hackers on a Plane' for US hackerspaces, and the very openness of the term – making, after all, could imply all kinds of very different activities – means that it tends to be used as a label for a more diverse range of spaces, with a wider range of histories, than hackerspace. Though it's not a trademarked term, the notion of a 'makerspace' is often also implicitly associated with *MAKE* magazine and the suite of commercial enterprises related to it (including the online community makerspace.com). *MAKE* was started in 2005 by Dale Dougherty, who had previously been involved in tech

publisher and mover and shaker O'Reilly Media (the business that popularized the term Web 2.0).²⁰ The magazine, Dougherty writes, was inspired by mid-twentieth-century publications 'like *Popular Mechanics*, which had the attitude, if it's fun, why not do it?'²¹ It is, as its name suggests, all about making. It features instructions on how to make anything from bamboo hors d'oeuvre trays to handcrafted drones, alongside stories from inspiring makers, product reviews, and features and facts. The magazine led to Maker Faires (the first took place in the Bay Area in 2006), a now global phenomenon where everyone from garage tinkerers to budding entrepreneurs and established commercial operations set up stalls to showcase their wares – or, more accurately, what they have made, as



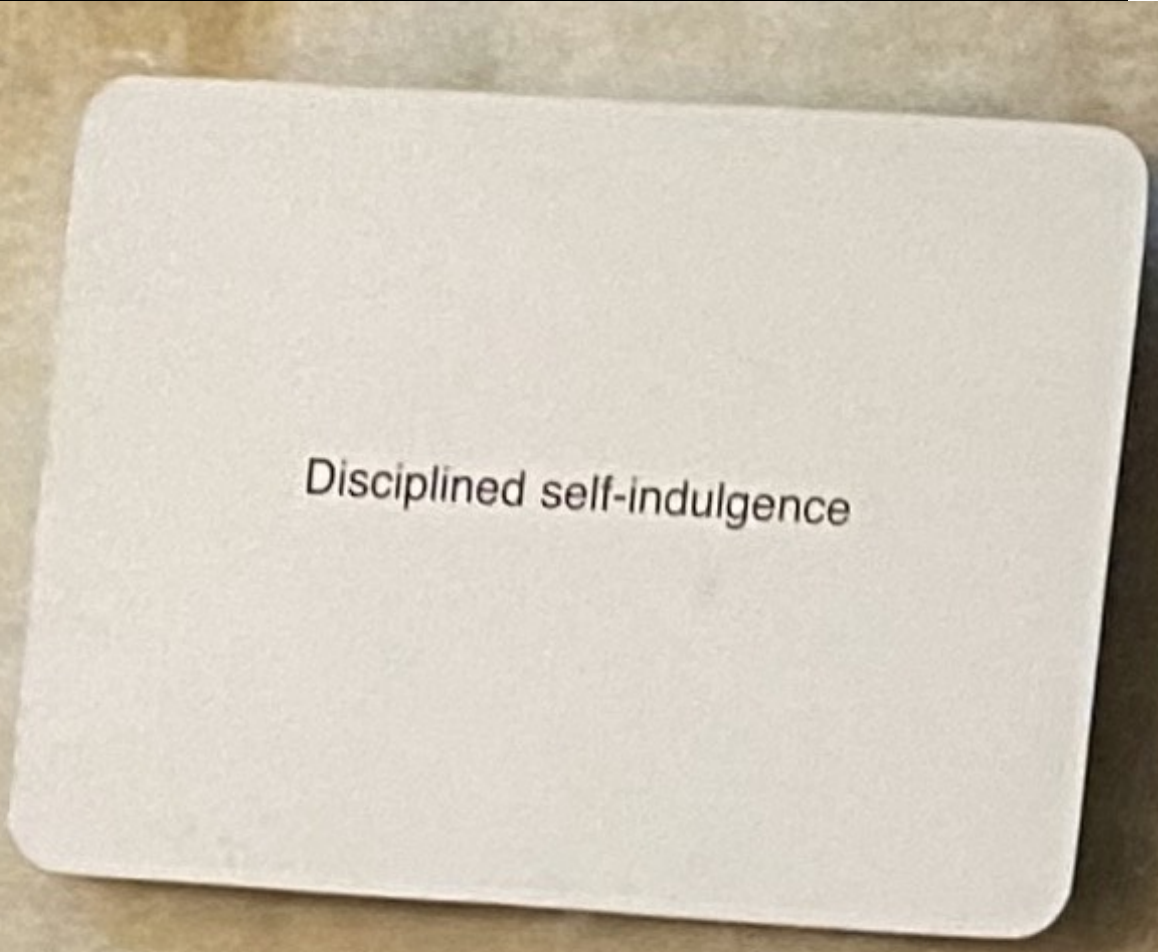
Don't be frightened of cliches

This centralized approach means that DIY bio activities do not always necessarily intersect with the wider hackerspace movement. Instead – and despite a widely shared desire to open up biotechnology to those outside academia or big pharma – biohacking spaces often have formal or informal connections to universities and private companies. Users of DIY bio spaces may have backgrounds in studying or working in biotech, but use these spaces to pursue side projects, develop their own spin-offs free of university intellectual property (IP) regulations, or, if they are students, get access to hands-on research. DIY bio is viewed as citizen science: there is suspicion of the limiting effects of institutional bureaucracy, the crushing weight of the requirements of commercial biotech, and the cramped nature of

contemporary scientific funding. It is thus about escaping the limitations of institutionalized biology, alongside educating the wider public in its tools and techniques. But it also has well-established links to government and regulators, particularly in the US, where a good relationship with the FBI has ensured that some of the early DIY bio spaces (such as GenSpace in New York) have survived and flourished. Finally, DIY biologists are often committed to open-source innovation, and to entrepreneurial activities (an interest in many biohacking spaces, though not a universal one) that utilize models of open IP or copyleft licenses.

Making a movement

The maker movement thus captures a set of



Disciplined self-indulgence

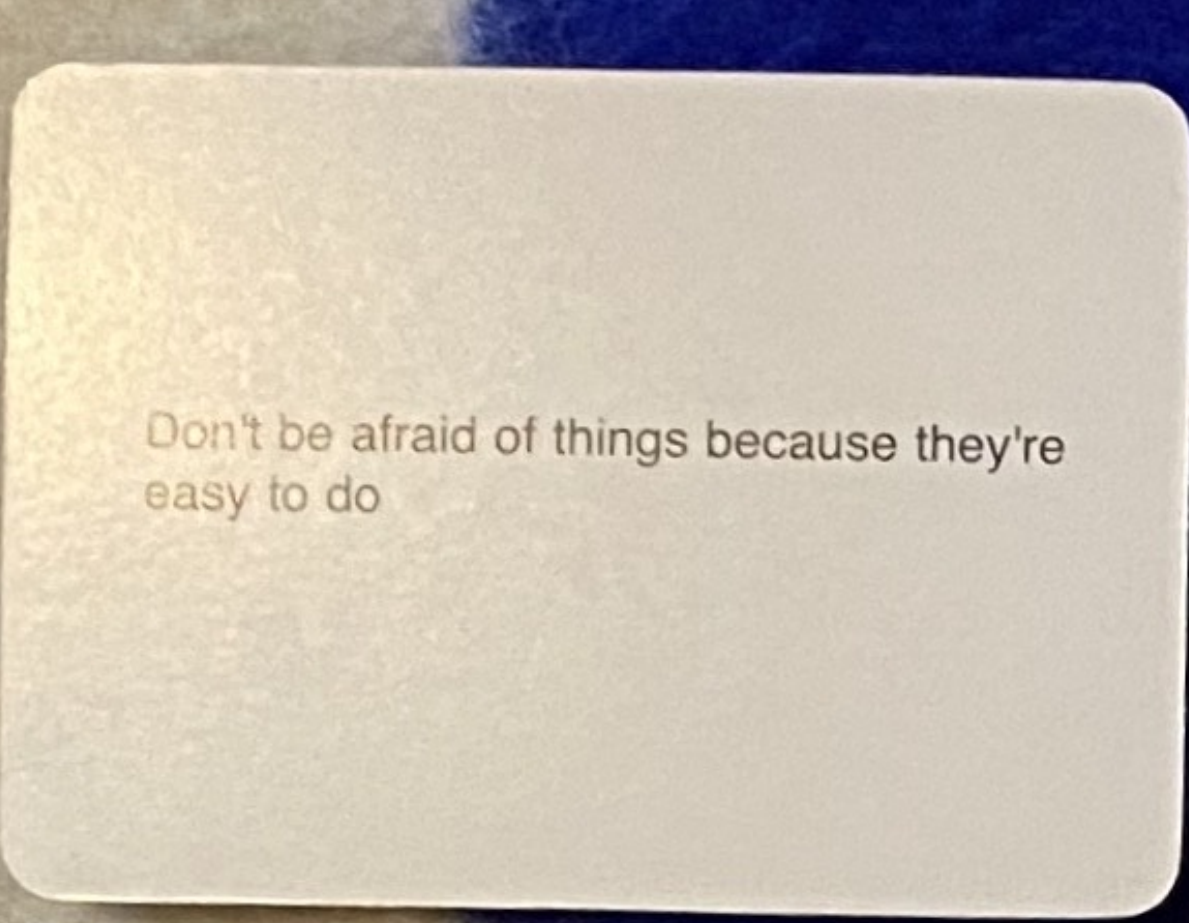
has written a blog series on starting a hackerspace,² and John Baichtal, in his book *Hack This*, has a whole section on developing your own hackerspace.³ Rather than repeating this, this chapter looks at how this kind of advice is used in practice by hackers and makers on the ground. It focuses on what we were told about the origins and organization of the hacker and makerspaces we visited, and the kinds of norms and attitudes that hackers saw as important in this. It explores the work that goes into making and maintaining a hacker or makerspace – the processes that are the ‘behind the scenes’ of cosy hackerspace caves or echoey ex-factories.

Origin stories

How do hackerspaces start? One of the first

spaces we visited, in Arizona, was relatively well established. It was some three years old at the time we visited, and Yan, whom we interviewed there, was one of its founder members. For him, the hackerspace first started to emerge into reality when he visited DEF CON (the hacking conference that also led to the Hackers on a Plane trip) for the first time:

So actually I went to my first DEF CON in like, I want to say '08 or '07, and I went with one of my peers from college, a fellow alumni. [...] I met some people from Phoenix and we exchanged cards or whatever. And we got back and we were like, That was really awesome. How come there's nothing like that in Phoenix? Because literally the other techies I knew in Phoenix were my coworkers in the IT department and some



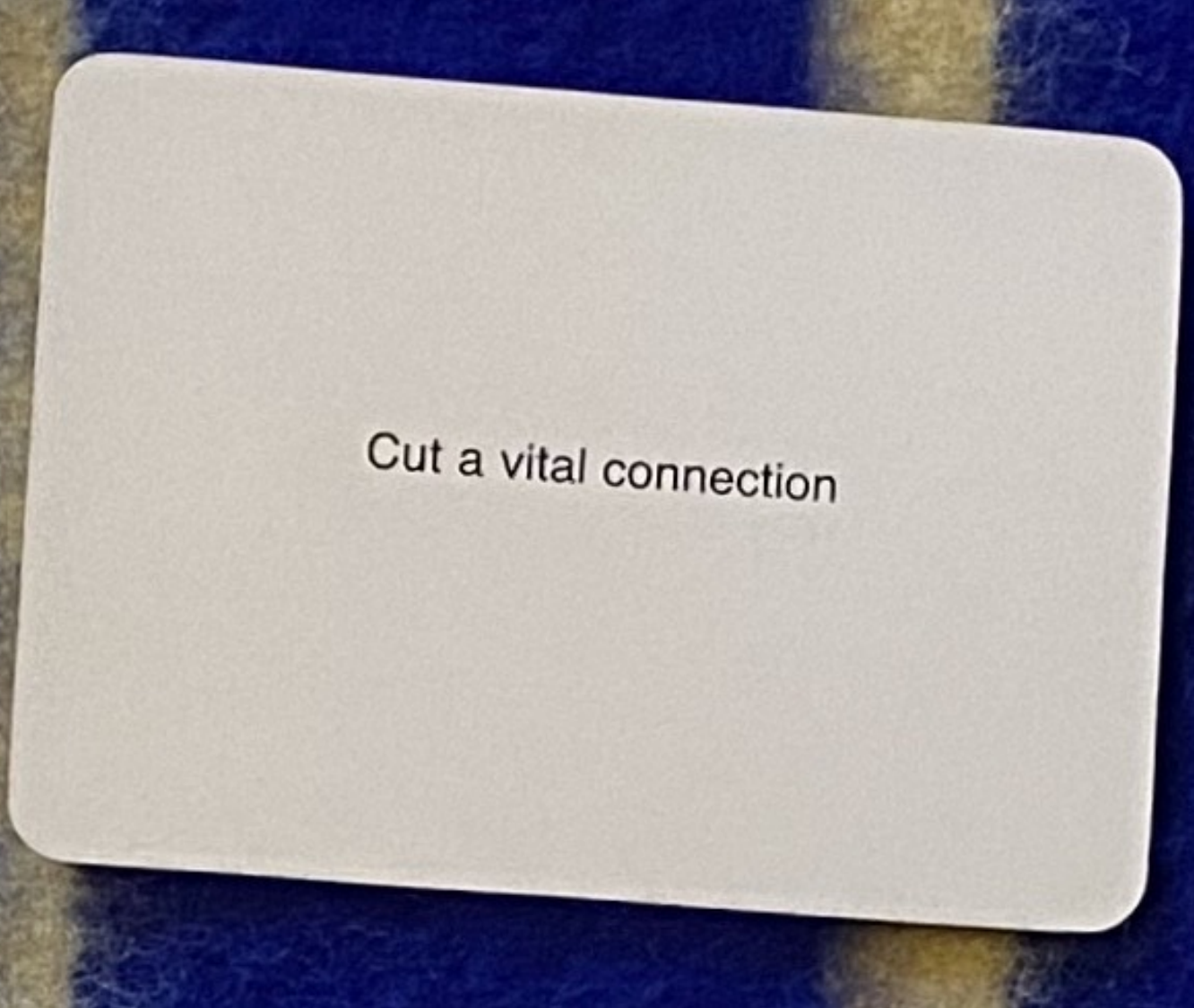
Don't be afraid of things because they're easy to do

anyone, in other words, could say that they didn't feel comfortable with that person becoming a member and the membership process was stopped there. This, Nick told us, ensured a community in which everybody liked and trusted one another – where people were comfortable with everyone else to the extent that 'you can give your apartment keys to them'. Other spaces tended to have less explicit blackballing systems, but still operated a membership process in which new members were voted in (or not). The emphasis was thus on relationships. Did the potential member seem to have the right attitude to the space? Did they do crazy stuff that might have hurt other people (like using equipment wrongly)? Did they get angry, or get on badly with others in the space? Ultimately, the key question was:

did other hackers and makers want to share the space with them?¹²

There was thus a strong sense that membership of a hacker or makerspace was a privilege that shouldn't be taken for granted. It wasn't always that easy to get in, and it was also a privilege that might be revoked if the hackerspace felt that was necessary. There were times, our interviewees told us, when it had been or might be necessary to discipline or throw out members. This could be a vexed issue within a do-ocracy. How should the decision that somebody had crossed the line, and needed to be excluded, be made within an open, grassroots-run space?

Hacker and makerspaces generally tried to keep rules and bureaucracy to a minimum. Though



Cut a vital connection

What emerged as we talked to more and more hackers and makers was a kind of constellation of attributes that were seen as related to hacking but which bled through into people's whole lives; together, they can be taken to represent a kind of 'hacker spirit'. I'll outline these characteristics in the sections that follow.

Making things

For many people we spoke to, an integral part of being a hacker was having the desire to create or make. It didn't really matter what it was you were producing; instead, the expectation was that you would follow your own interests and passions to make original and interesting stuff. This interest in being *generative* was seen as something that bound hackers together. You might make software or

you might make giant walking robots or you might make new organisms or you might make sculptural art – but basically you were someone who was interested in 'making new cool things' and 'being your own creator' (to quote two people we spoke to). You were creative rather than destructive.

Let's go back to Kip's experiences to see what that could mean in practice. Kip's interests, as a hacker, were primarily focused around electronics and programming (he described one of the projects he was working on as a kind of 'home-brewed server system'). But he told us about a time when he met a member of another hackerspace on a bus; they got talking, and were delighted to realize they were part of the same community. Kip was fascinated by this woman's hacking activities, which were totally

Where's the edge?
Where does the frame start?

collectives to cooperatively run businesses.

This sense of continuity with other groups made it all the more striking when hackers and makers told us that something was definitely not hacking or a hackerspace. In these cases talk of continuity and similarity came to an abrupt stop. A line was drawn in the sand: this thing, or group, or activity just wasn't about hacking, but something else entirely.

This happened, for example, when some people talked about TechShop. Dan was very clear that the TechShop located not far from their hackerspace was simply 'not a hackerspace'. It was:

membership tool access. But they don't have a sense of community that you find in a hackerspace. [...] It's a business. That's the

big line right there, is they're for profit. They're a business. They have a service they sell.

TechShop, Dan said, was a great resource: he was happy that they were there, and many of their members used it occasionally. But they were different to a hackerspace in two key ways: they were about making money and they lacked a 'sense of community'. It was the latter, in particular, that we were told again and again. Community is what makes hackerspaces special, and it's that which sets them apart.

We've already started to see this emphasis on community as central to hacking and making. Community, sharing and learning from one another are key aspects of the hacker spirit. In terms of organization, hacker and makerspaces

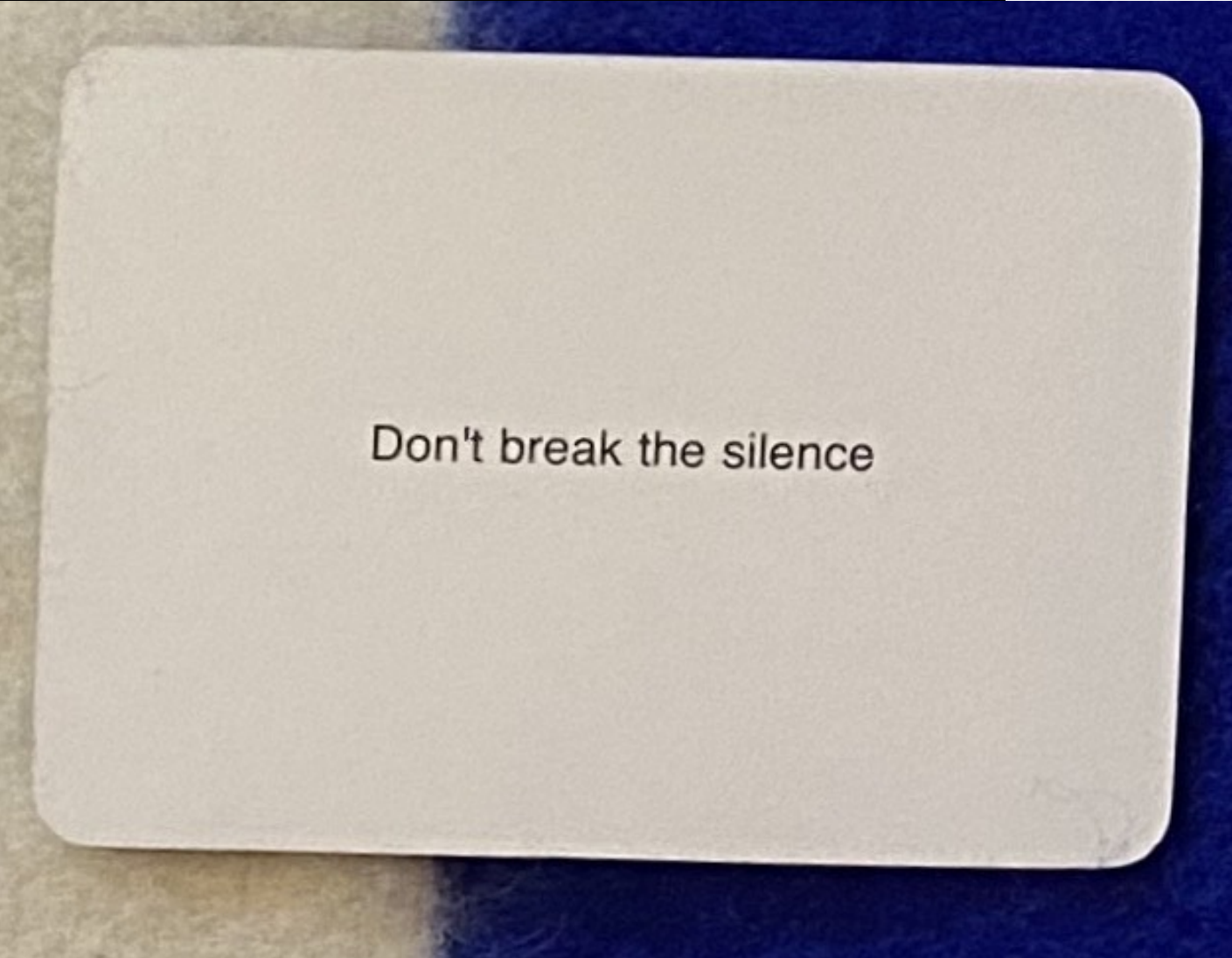
Remove ambiguities and convert to specifics

we didn't collect data on the demographics of the hackerspaces we visited, it was clear that many did not reflect the make-up of the wider communities they were located within. At the very least, this complicates the stories of empowerment – technology to the people! – that some public accounts of hacking and making have emphasized. It also raises questions. **Why do hackerspaces work so well for some people – providing the community they crave – but seem to exclude others from that same experience of community?**

Empowerment and exclusion

Many hackers and makers found it hard to talk about these issues. Some of our interviewees, at least, were uncomfortable reflecting too hard on the composition of their hackerspace. They

simply didn't understand, often, how the space or the behaviours of those in it could be construed as unwelcoming or intimidating. **Sometimes there was a sense that those from under-represented groups – women, queer people, people of colour – needed to step up and get involved in demographically skewed hackerspaces in order to change the culture themselves.** It was also clear, however, that many of those that we spoke to had had an experience of hacker and makerspaces that was the exact opposite of exclusion. Many of our interviewees told stories of personal empowerment through access to hackerspaces; not only this, but empowerment, in the form of renewed self-reliance and personal agency, was seen as a key part of the hacker spirit.⁷ 'The hacker lifestyle', student hacker Kip told us,



Don't break the silence

very inclusive', we want to be 'accessible to all', we were told at various points as we visited hacker and makerspaces. Most spaces explicitly seek to be open to anyone, of any background, who is interested in participating, and in this respect hackers and makers imagine themselves as looking outward, beyond any particular age group, class or background.

The experiences we've looked at in this chapter, however, complicate this story. Clearly, not everyone feels welcome in (some) hackerspaces, and their demographics do not suggest a community where the commonalities are solely rooted in a particular lifestyle or interest (rather than in social class, economic resources or educational background). The success of hacker and makerspaces, in terms of the transformative

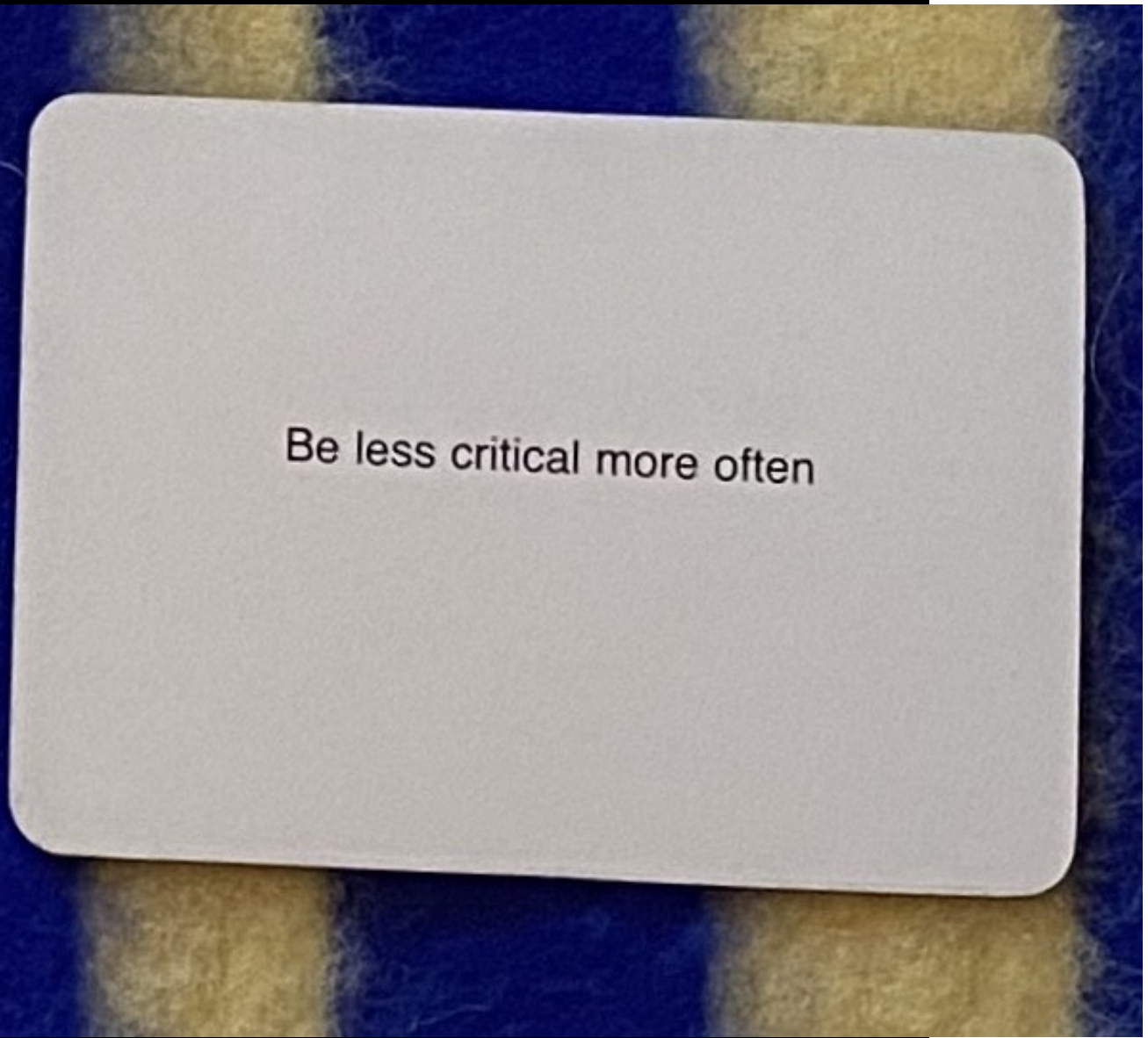
experiences of community that people told us about, may therefore emerge not just from finding a community focused on hacking but one that feels cosy because it is full of people who are not that dissimilar to you. There are, it seems, also other forms of bonding social capital at work in (most) hackerspaces, that between people from the same intellectual, economic and social backgrounds. Perhaps the community spirit in hackerspaces is so exciting because in many ways it is relatively easy, focused not only on shared interests but on a shared set of experiences and assumptions. In this respect, some hacker and makerspaces are creating bonding social capital not around hacking but around hacking by certain kinds of people: those who are, or who are comfortable being around, young, educated, men. The irony



necessarily explained in terms of coolness but which nonetheless seemed to be an important driver in structuring what people got from participating in hacker and makerspaces. This was a desire to be hands-on: to actually engage with the messy, resistant physical stuff of the world around you. Some people, at least, were drawn to hacker and makerspaces exactly because they offered a focus on physical materials, creation and community that stood in contrast to their increasingly digitized and mediated experience of everyday life.

While hackers and makers didn't tend to draw a sharp distinction between computer-based hacking and more hands-on making or hacking (those in hacker and makerspaces were often involved in both), they did at times talk about an over-engagement with the digital that led

them to the pleasures of making. There were a number of IT professionals amongst our interviewees; one explained that his 'after-work interest is in physical stuff' like soldering electronic systems or making a robot rather than in the computer work he spent his days doing. Exactly because these individuals already spent their time coding – something which made them an important resource for the hackerspace – they liked to immerse themselves in making and creating physical things. More generally, people spoke of the value of a space where they could get their hands dirty and thereby learn, know, in a different way. You need, one hacker told us, to 'tickle the parts of the brain that are not satisfied with a completely virtual pursuit'. Someone else, whose previous creative

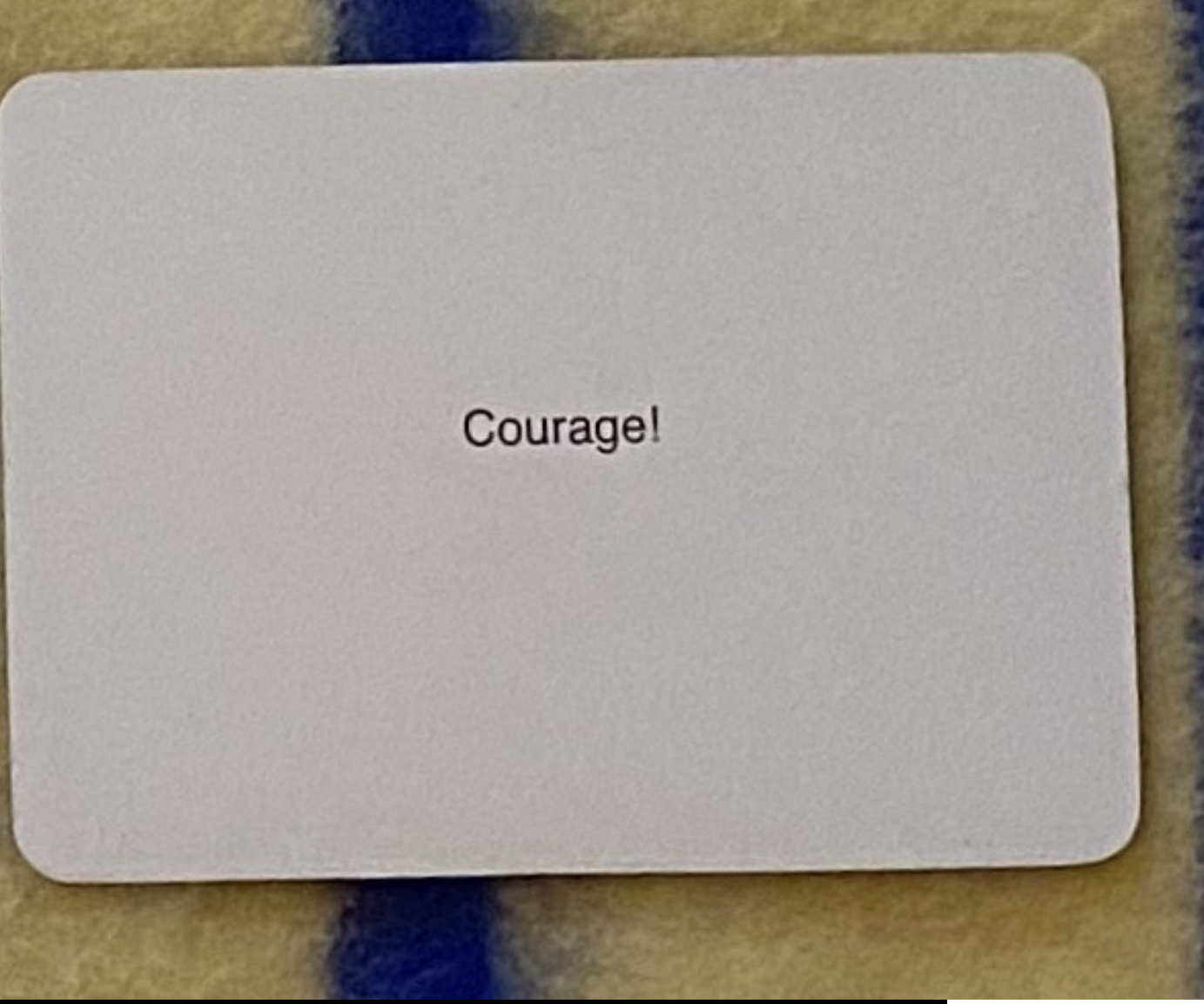


Be less critical more often

hackerspace. It needed to be clear, Nick said, that their space didn't 'have a unified point of view and that individuals are free to do what they want'. The hackerspace was thereby viewed as politically neutral, somewhere that Democrats and Republicans and anarchists might rub shoulders without their different views becoming an issue. A few people told us explicitly that what they did was different from more 'political' versions of hacking. This tended to be based on a distinction made with hackers and hackerspaces, in Europe or elsewhere, which were overtly part of an actively resistant counter-culture. This was fine, people said – but it was not for them. 'We're very much a hackerspace', one hacker, Dan, told us. 'But we're also not because we don't have a lot of the cultural political baggage

that a lot of the hackerspaces have.' Dan's space, he told us, didn't want to be a 'cause'. They didn't want to get distracted by wider social or political projects as some other hackerspaces had been; for them, the emphasis had to be on making stuff (and on building a community based around these activities: they saw themselves as a 'clubhouse'). Because of this they occasionally got some pushback:

Well, we'll get some people from some European countries coming in, like, This isn't a hackerspace. I know what a hackerspace is. Our hackerspaces are political. One of our earlier members, he's Austrian and his wife is involved at Metalab, the hackerspace. You know, where this current trend has started from. And they're very much – they are active. They are



Courage!

15. Be functional—all parts must work for their living

15 <http://bollier.org/blog/morozov-maker-movement>. Others have similarly questioned the techno-utopianism inherent in discussion of the making 'revolution'. For a discussion of how this relates to 3D printing, see <https://modelviewculture.com/pieces/questioning-the-3d-printing-revolution>

16 Lindtner, S., 'Hackerspaces and the Internet of Things in China: How makers are reinventing industrial production, innovation, and the self'. *China Information* 28(2), 145–67, 2014. See also <http://www.3ders.org/articles/20111124-hackerspaces-in-china.html>

17 http://en.cncnews.cn/news/v_show/43702_2014_Beijing_maker_carnival.shtm

18 <http://hackaday.com/2011/11/27/chinese-hackerspaces-or-what-happens-when-a-government-is-run-by-engineers/>

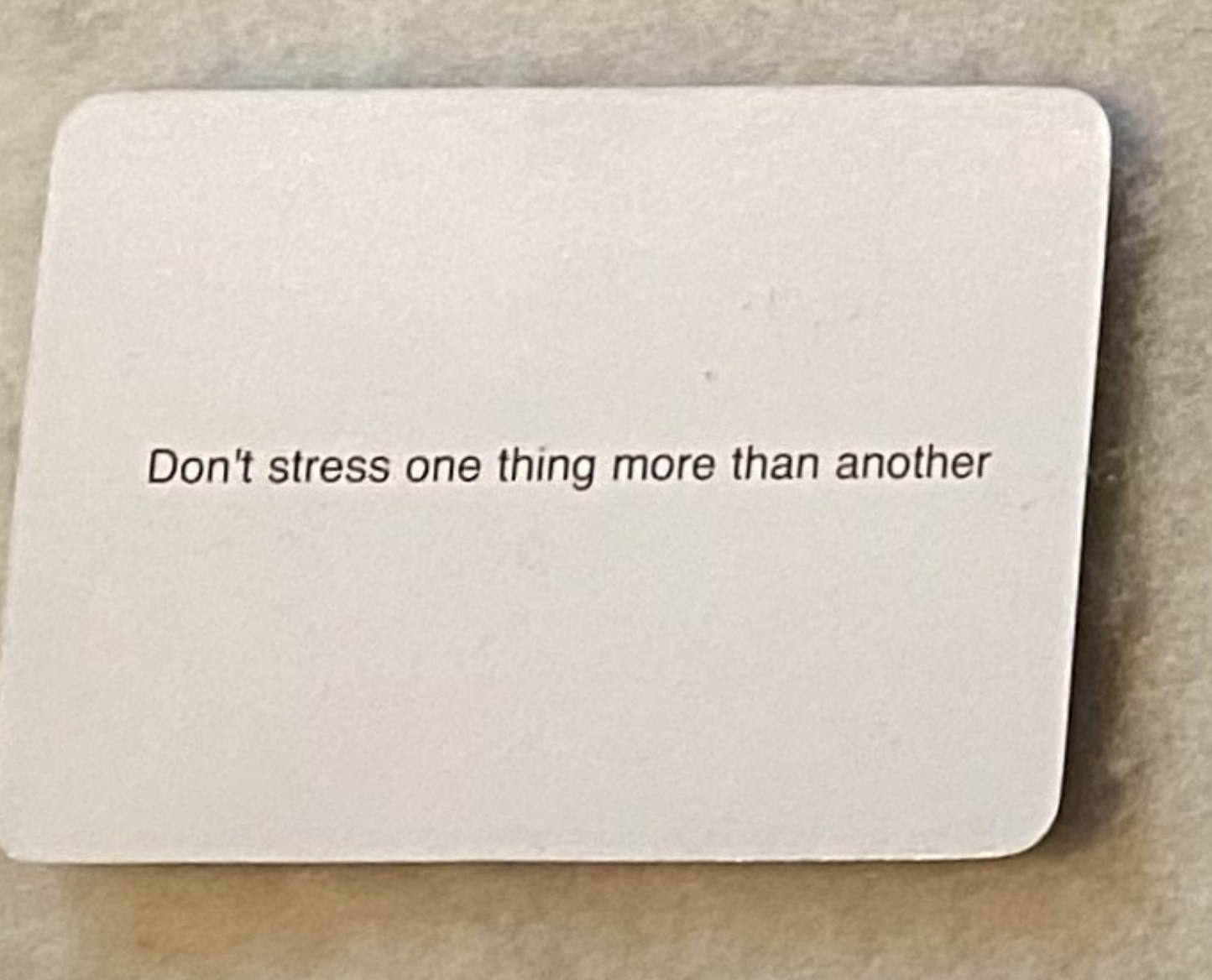
19 Lindtner, 'Hackerspaces and the Internet of Things in China'.

20 <http://www.wsj.com/articles/SB10001424052702303722604579111253495145952>

21 Though see the debate in the comments here:

<http://hackaday.com/2011/11/27/chinese-hackerspaces-or-what-happens-when-a-government-is-run-by-engineers/>;

strikingly, one comment reads, 'this is a hacker sight [sic] and it is not in our area to discuss politics'.



Don't stress one thing more than another

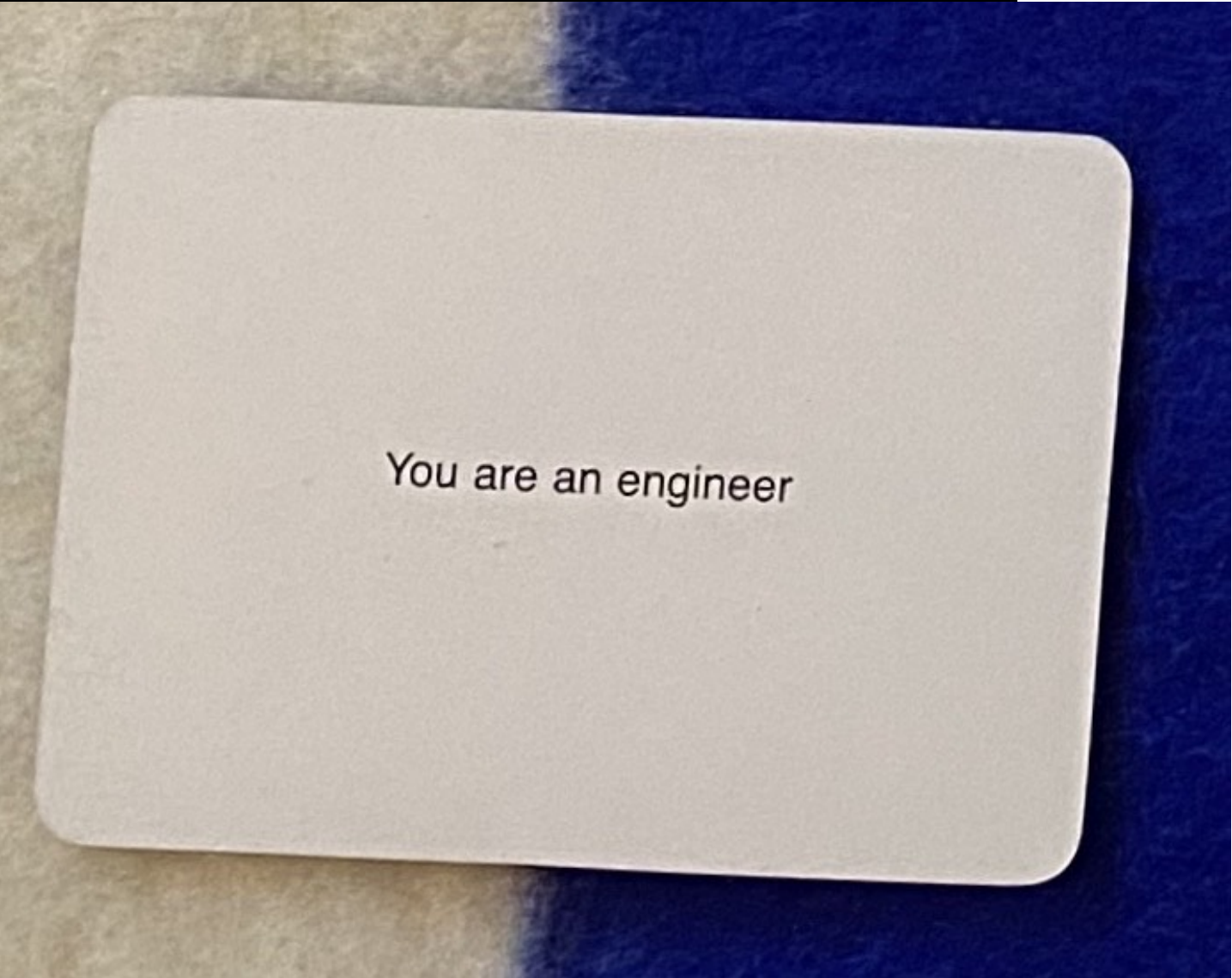
engagement with the material world. But no one is claiming that involvement in a quilting circle is going to prompt a new industrial revolution.

This raises the question of the newness, or otherwise, of hacker and makerspaces themselves. Certainly, the spaces themselves are new. I've talked about the meteoric growth of hacker and makerspaces in North America and beyond: around 30 worldwide in 2007; almost 500 in 2011; 1,233 active spaces when I checked on hackerspaces.org in 2016.⁴ Businesses like TechShop, MAKE and other makerspace franchises have emerged over the last decade. The terminology of hacker and makerspaces and that of the 'maker movement' is certainly an innovation. But are the practices that these spaces host anything different from

those found in other kinds of craft or making-oriented associations? Is the sociology, the way in which hackers and makers interact with each other and with their tools and projects, different – or are hacker and makerspaces old wine in new bottles?

The novelty of hacking and making

Plenty of people have argued that the rise of hacker and makerspaces does represent something dramatically new. For many proponents, the maker movement is both a discrete, clearly identifiable development and a step-change in how entrepreneurship and innovation are imagined and carried out, something that is radically different from what has gone before. One academic analysis of current discussion of the maker movement



You are an engineer

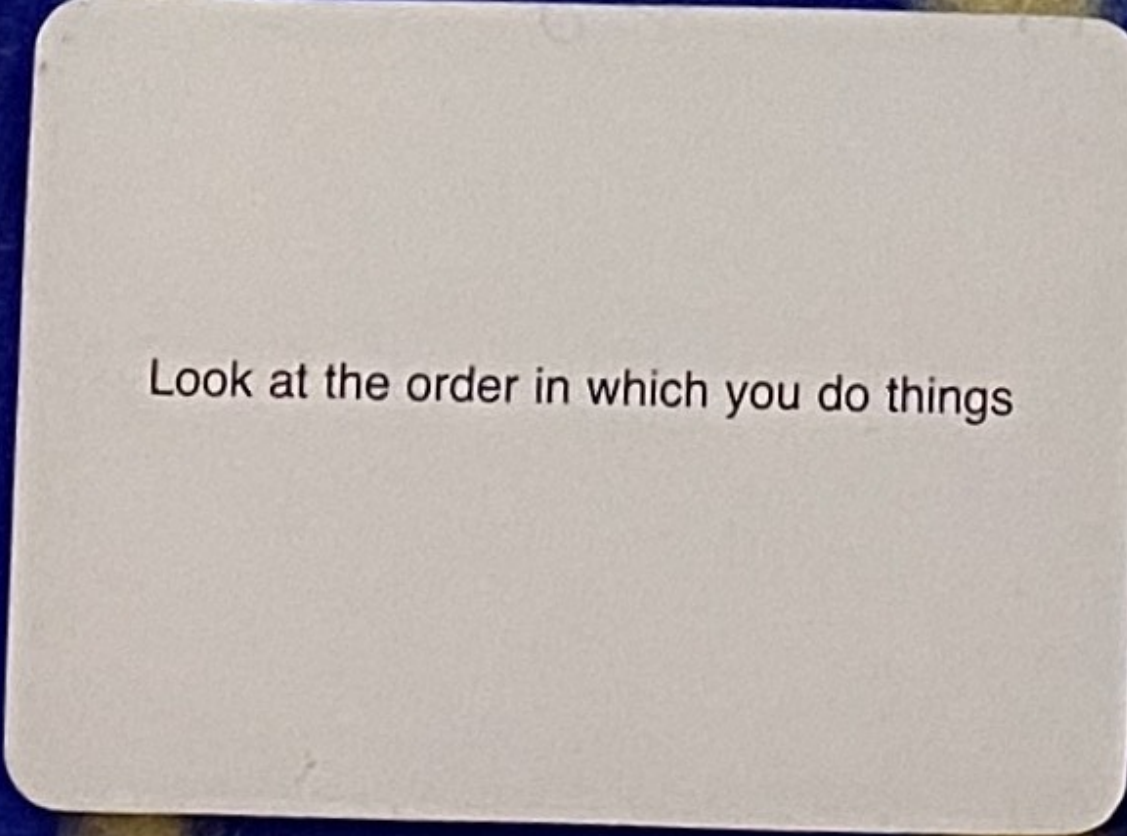
food, suggested the writer, is not hacking:

I get the impression that people who call themselves ‘food hackers’ call themselves that because they want to be considered a part of the ‘hacker movement’. Why don't those of you who identify with this moniker just call yourself a ‘cook’, ‘chef’, ‘baker’, ‘maker’, or whatever instead? Why don't you instead call the food ‘food’ or if you really want it to be associated with the hacker scene, ‘food for hackers’? Is that hard? You're not a hacker and you dilute the term for those of us who are hackers.¹³

The author started their message by citing a definition of hacking that referred to computers; for them, hacking was something that was highly delimited, and the term should

only be used to describe clever fixes and solutions in the context of computing.¹⁴ As such, they were annoyed about what they saw as the proliferation of the term where it shouldn't be applied: anyone who picked it up and used it in other contexts was ‘diluting the term’. These people should ask themselves why they were so eager to call themselves hackers. ‘Why’, the poster wrote, ‘do people who are playing with their food want to be a part of the hacking scene?’

The resulting discussion thread involved some 70-odd messages, variously rejecting, supporting or commenting on food hacking and the notion of hacking in general (with many of the messages comprising a back and forth between the original poster and their critics, including various comments on their

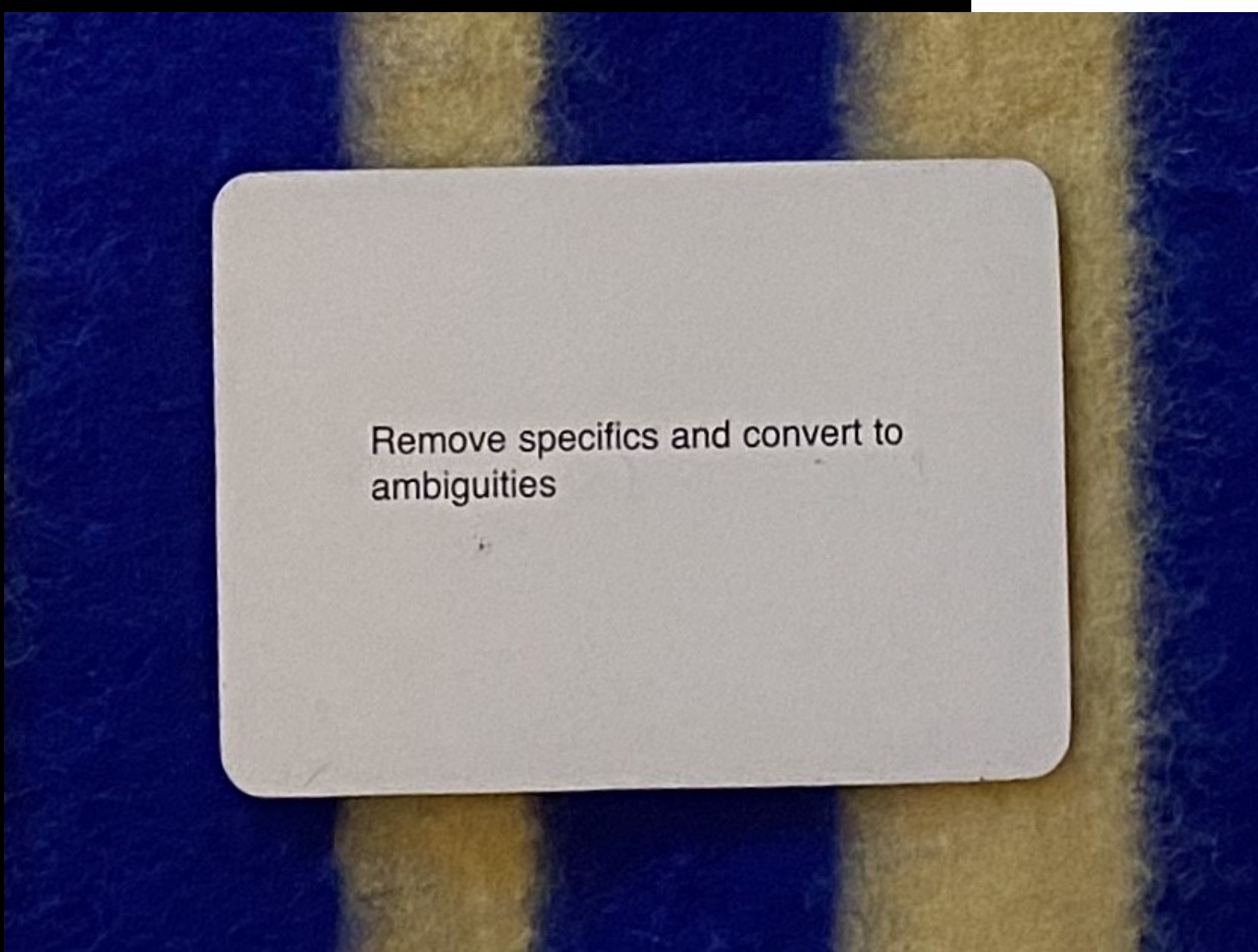


Look at the order in which you do things

degree that we were told that franchised or impersonal makerspaces were not 'real' hackerspaces because they lacked community. A hacker or makerspace could only successfully function, in terms of its governance and administration, if it had a committed, sharing community. Spaces struggled because their communities were not tightly knitted or proactive enough – because they fell back on the hierarchies of the outside world, or were not sufficiently 'grassroots' in their priorities and administration.

We have also seen that there can be pathologies of community within hacker and makerspaces. At best, there were issues where erstwhile leaders or officers found themselves 'forcing people to be grassroots'. Individuals took on what they thought were largely nominal

positions on a board or leadership group only to find that there was a constant struggle to encourage other members to step up, take decisions and live out 'do-ocracy'. At worst, community can function to exclude particular people, and to create a 'dominant culture' that is intimidating or unwelcoming. Many hackerspaces seem to fail at creating diverse community (just as the tech industry does more generally), an issue that has led to the rise of more focused communities that welcome those who are otherwise excluded or alienated. Community could even become a distraction. Some of those we interviewed spoke about their concerns that their space was too much a social environment, too much somewhere to hang out with your friends rather than a place to make and hack. Should hackerspaces be



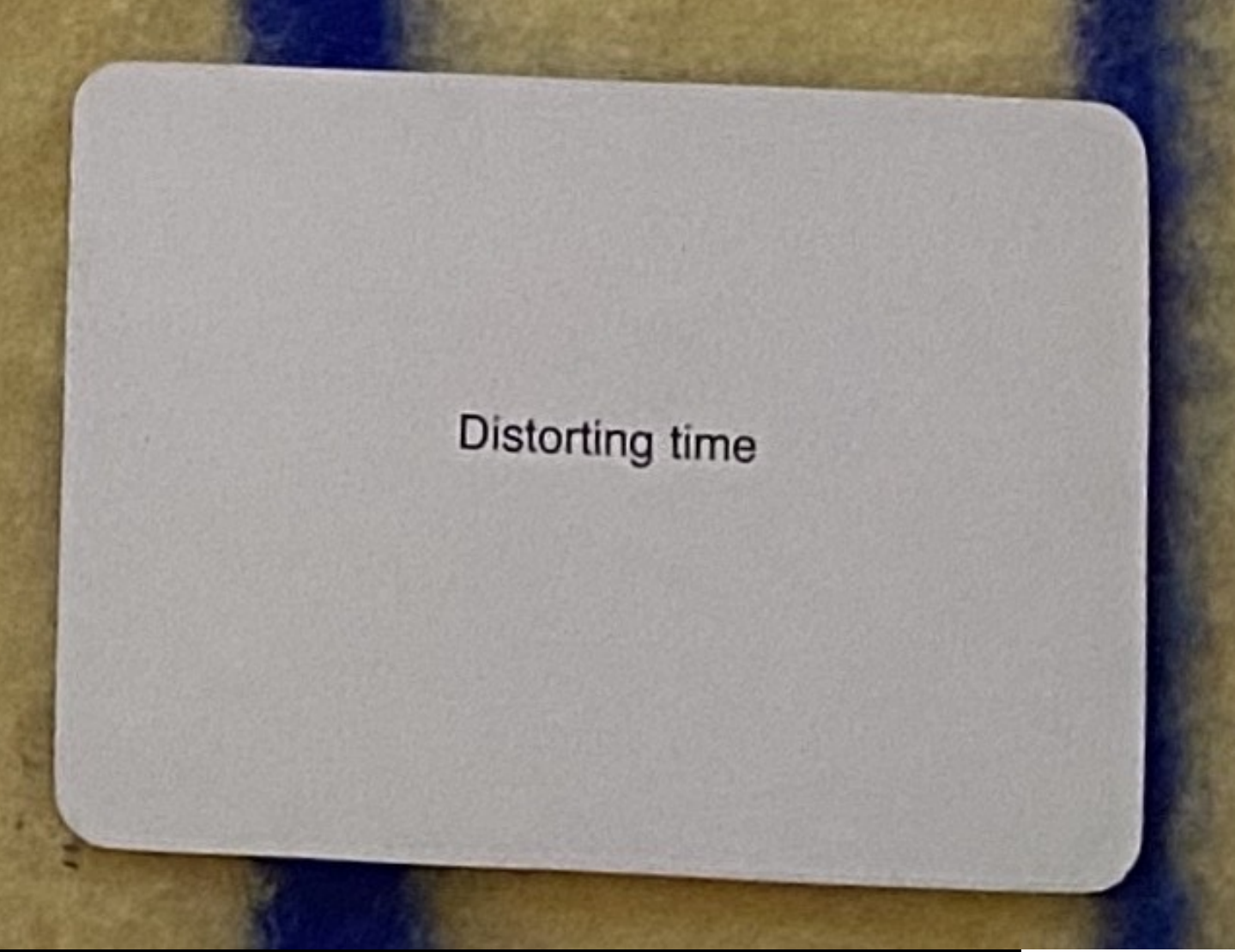
course. As a result, there are greater possibilities for choice in the conduct of relationships, but this has required intense and continual negotiation and decision-making.¹⁴

In a world in which we are expected to 'make our own opportunities' we are faced with continual choices – choices which are liberating, but which may also be overwhelming. What work should I do? Who do I want to be intimate with, and how? Where should I live? Ultimately: who am I? The hacker spirit, and its expression in the maker movement and related forms of serious leisure like DIY or crafting, fits squarely into these dynamics in that it can help individuals consider these kinds of questions. **Hacking allows you to curate your surroundings,**

tweaking your tools and technologies such that they are a better fit for your life. Crafting can enable you to 'find your people' and gain a better sense of your own identity. Web 2.0 platforms mean you can opt out of traditional broadcasting and become your own media curator and producer, personalizing the content you are interested in. DIY homeschooling or food production can allow you to ignore the mainstream and fit your family's education and nutrition exactly to your beliefs. These forms of active leisure thus continue our societies' emphasis on individual agency as the key way in which the world is made **meaningful** and, importantly, as something we can act upon to change.

Personal empowerment is a wonderful thing. Few of us would want to live in a world in

19. 'It was so; I was there, and I saw it'



Distorting time

and equality, and even organize government; as such, they offer a kind of ideal type of how all citizens should behave and interact.

Hacking may be prominent right now because it feeds into some of the less savoury dynamics of our times: a focus on individual change over collective action; an emphasis on the responsibility of individuals with no appreciation of wider circumstance. At the same time, it is impossible to doubt the enthusiasm, good-heartedness and generosity of the hackers and makers we spoke to. People were genuinely excited about the pleasures of creation and the possibilities of hacking the world around them. Whether talking about the pleasures of working recalcitrant materials or of doing messy community, hacking and making were practices streaked through with

joy. While the movement as a whole may resonate in surprising ways with mainstream economic policy, it is clear that, for those we spoke to, participating in hacker and makerspaces was experienced as emancipatory and personally empowering. Hacking had changed these individuals' lives by telling them that anything was possible, and they were eager to see others' lives changed in the same way. Taken together, however, the conversations we had reveal not just resonances with mainstream culture but a set of tensions that run through the growing movement around hacking and making. There are contradictions and questions that sit in the background of most hackers' experiences, barely visible in the everyday life of hacker and makerspaces. These tensions will, I think, force

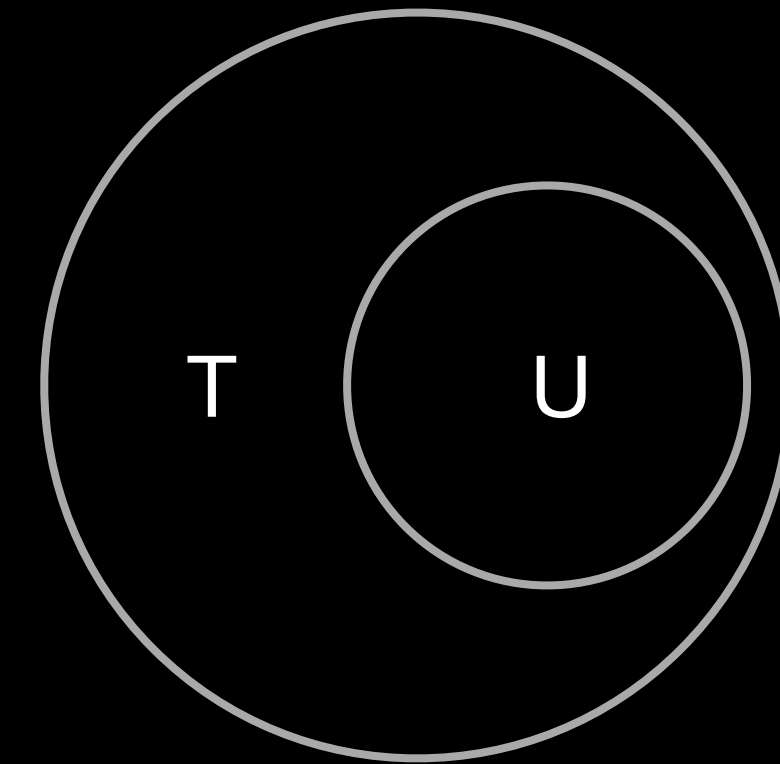
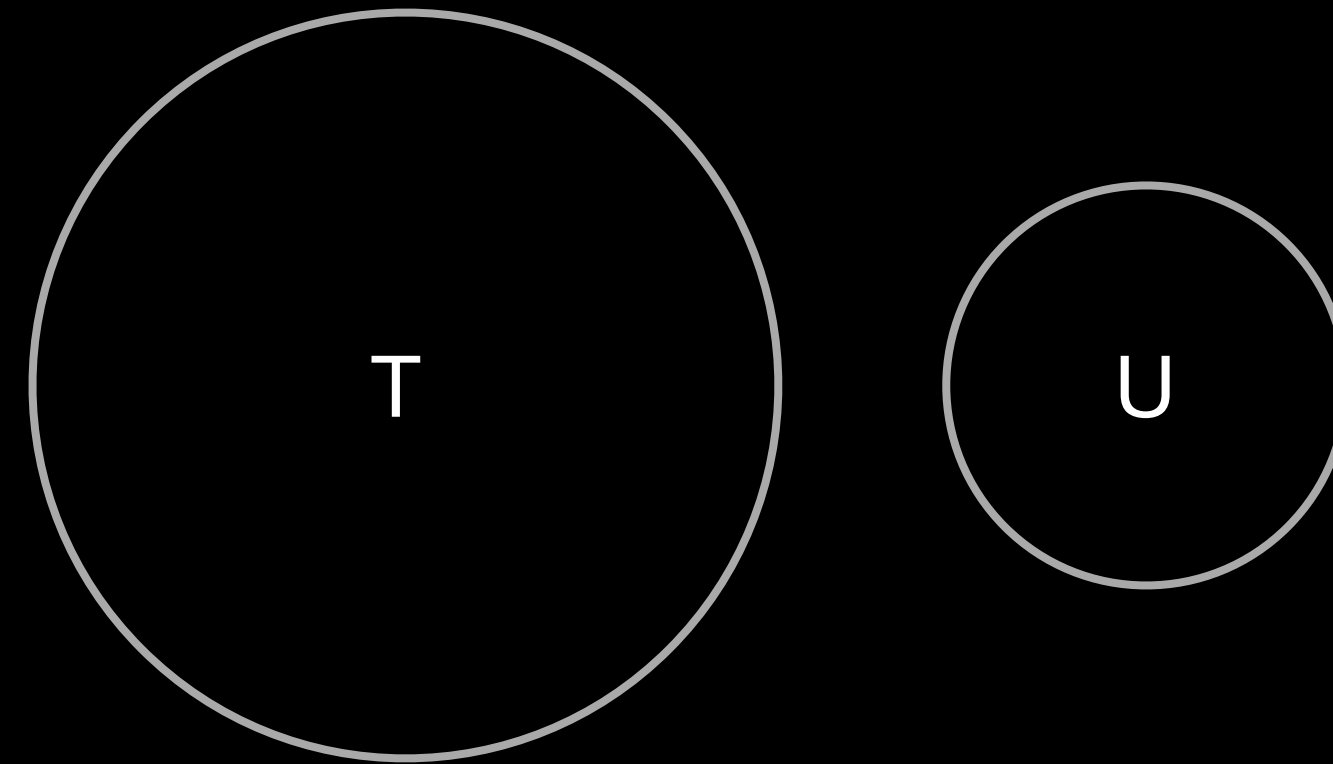
- RANGE: all pairs are *ordered* (i.e., *vectors*)—a 2nd term U is always a precisation of a 1st term T

PRECISATION (Arne Næss)

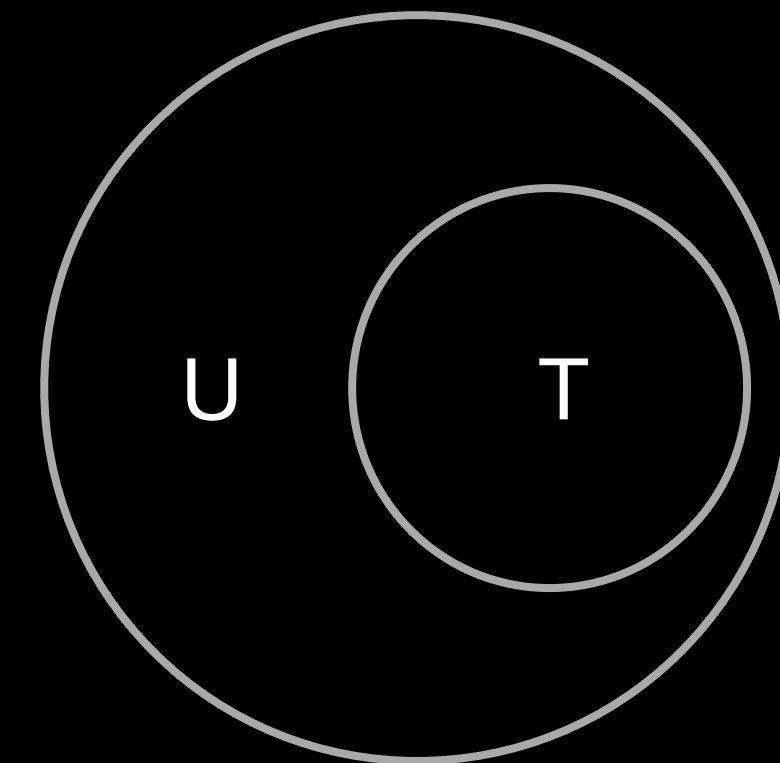
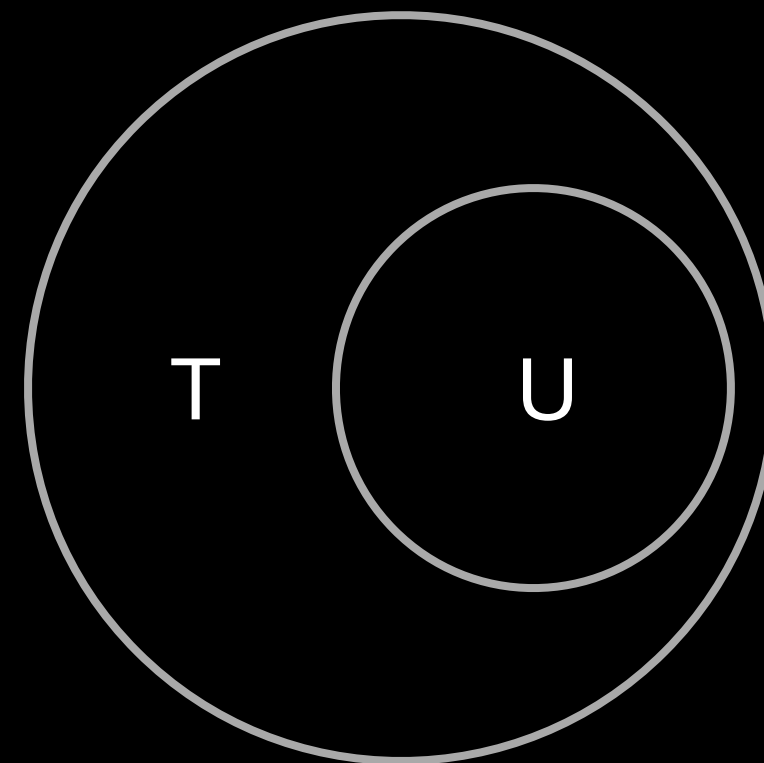
implement...

...such that:

application: GENERAL— (G)



application: SPECIFIC— (S)



(G)	(G)	(S)	(G)	(S)	(G)	(G)	(G)	(G)	(S)
11	12	3	14	5	16	17	18	19	10
20	9	8	7	6	15	4	13	2	1
(S)	(G)	(G)	(G)	(G)	(S)	(G)	(S)	(G)	(G)

In total darkness or in a very large room,
very quietly

finished projects these tools are being used to build. You can see anything from beer brewing systems to exquisitely fine jewellery and hacked bikes with glitterballs attached to them. There's more space, so there are more comfy chairs, plus a library of sofas, armchairs and bookshelves in the centre.

But we might also begin in the media, with the UK's *Guardian* newspaper launching its 'Do Something' campaign in early 2014. This was, as the paper wrote in its 'Do Something Manifesto', an invitation to 'try something new'. Through a monthly magazine, journalists present stories and discussion about easily accessible and low-cost opportunities for readers to try something different. Articles give advice on everything from places to learn how to upholster your furniture to unusual ideas for

a date or whether it's possible to learn Russian in a day; the tone is chatty and friendly, with reader feedback and sections like 'The Do Something Challenge' and Beginner's Guides. The campaign, the Manifesto explains, is motivated by the belief that the experience of novelty adds value to people's lives. Whether it's trying out new things, meeting new people or learning something different, living life such that you accrue new memories and new experiences means that you will live more intensely. If you 'broaden your horizons, learn new skills, or implement more beneficial habits', they suggest, your life will be more satisfying (though also perhaps harder work: the first magazine contains a list of tips on how to meet your goals and stay motivated).

This book is about the connections between

1. Begin at the beginning; a fresh start

Retrace your steps

everyone was suddenly like a contributor. The fundamental thing about a hackerspace, Winni says, is that it is not 'a power pyramid... it's a space for all the members equally'. Again, this emphasizes the grassroots nature of the space – the fact that it has to be what its members demand of it. Her experience had been that stagnation in the space, and unwillingness for this grassroots nature to be lived out, was overcome by discussion amongst members. Just having a conversation made it clear that everyone had 'opinions and ideas', and, having expressed those opinions and ideas, people became more active contributors to the space. That one discussion, Winni told us, triggered a new sense of ownership of the space and with it a greater sense of responsibility. At that moment, at least, the

space was operating according to its implicit ideals. Its organization was centred around active participation, discussion and a lack of hierarchies.

Meeting these ideals was a long-running issue. Winni's hackerspace had, like many others, a small elected board (the members of which were called 'officers') which was, at least in theory, a nominal position. She'd served on this for two years; ideally, she told us, she would have stepped down after a year but there hadn't been anyone to replace her. Winni was committed to what she saw as a 'hacker culture' of shared responsibilities and ownership, which she saw as empowering people to do what they wanted without worrying too much about what was allowed or not allowed. So she found the difference that

10. Affirm contingently

Imagine that you are in a pitch dark room, and that your only way to make discoveries of where you are is to fumble your way in the dark. It quickly becomes evident to you that the place is crowded with tools and machines. The tables are thicker than usual and you imagine that they could be workbenches. After some trials-and-errors you realise that you may be on your way out, because you find some narrow and slender cupboards with locks on them. The locker room indicates that the place is a share space in which people confine some individual items.

The the light is turned on, and you realise that you are in a huge space where everything just felt so local when in the dark. From the locker-room onwards the place is filled with possibility.

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U (GENERAL)

Through the core, and beating heart, of the maker space runs a paradox: the people that are part of it feel that the place is supportive and inclusive, and that people recruited to the maker space are ones that fit that description. Which means that some people are invited in and some people aren't.

The corollary is that maker-spaces do not include a high number of people of colour, queer people and tend to have a gender bias. This is in the US, mainly. This is the paradox: seen from within the recruitment policy is consistent with the community values of the maker space. The consequence, however, is that a number of people who could be supportive and inclusive are not recruited.

If these consequences are seen as contingencies, Norman Potter would claim that they do not respect situations.

R2

DAVIES, SARAH R.

HACKERSPACES: MAKING THE MAKER MOVEMENT

Change nothing and continue with immaculate consistency

2. Seek always the resident principles

knitter, but she was regarded with a kind of awed fascination by the rest of the family, as weirdly skilled and dedicated). But suddenly, somewhere in the mid-2000s, knitting was something that young women, living in cities, did by choice. It was a fun, sociable activity: you could join a Stitch 'n' Bitch group, find patterns and community online, and read lively, feminist-inflected how-to guides such as Debbie Stoller's *Stitch 'n Bitch: The Knitter's Handbook*.¹ Friends admired each other's handmade scarves (featuring fashionably chunky yarn or technically impressive designs) and swapped patterns. The rise of cool crafting had begun.

This rise has only continued over the last decade. Skills and techniques that were previously viewed as outdated, unnecessary or

time-consuming to the point of drudgery are being revived and celebrated.² It's not just knitting: sewing and embroidery are currently having a moment, as indicated by the popularity of television shows such as the BBC's Great British Sewing Bee, in which members of the public compete to be named the UK's best home sewer.³ The *Guardian* newspaper's 'Do Something' campaign has featured furniture upholstery as a potential hobby, and describes growing interest in classes in it.⁴ Meanwhile, websites such as Etsy (the online retailer for 'all things handmade') and Folksy (focusing on modern British craft) simultaneously showcase the possibilities of crafting – encouraging visitors to invest in supplies and get creating on their own account

R12

DAVIES, SARAH R.

HACKERSPACES: MAKING THE MAKER MOVEMENT

Don't break the silence

12. Equate means, constraints, opportunity, response

very inclusive', we want to be 'accessible to all', we were told at various points as we visited hacker and makerspaces. Most spaces explicitly seek to be open to anyone, of any background, who is interested in participating, and in this respect hackers and makers imagine themselves as looking outward, beyond any particular age group, class or background.

The experiences we've looked at in this chapter, however, complicate this story. Clearly, not everyone feels welcome in (some) hackerspaces, and their demographics do not suggest a community where the commonalities are solely rooted in a particular lifestyle or interest (rather than in social class, economic resources or educational background). The success of hacker and makerspaces, in terms of the transformative

experiences of community that people told us about, may therefore emerge not just from finding a community focused on hacking but one that feels cosy because it is full of people who are not that dissimilar to you. There are, it seems, also other forms of bonding social capital at work in (most) hackerspaces, that between people from the same intellectual, economic and social backgrounds. Perhaps the community spirit in hackerspaces is so exciting because in many ways it is relatively easy, focused not only on shared interests but on a shared set of experiences and assumptions. In this respect, some hacker and makerspaces are creating bonding social capital not around hacking but around hacking by certain kinds of people: those who are, or who are comfortable being around, young, educated, men. The irony

Which is why the *Stitch 'n Bitch: Knitter's Handbook* is relevant in the context, since it rides on the momentum of knitting groups in the mid 2000s—in some aspects resembling maker-spaces—while connecting these to feminist contents and culture. Thereby linking the contingencies of knitting groups to the political culture of feminism. The thing being that the knitting groups weren't restricted to women, but to gender. Sarah Davies also points to knitting magazines for men, in which a point is made of the male gender-identity of the knitters. So it is not fe/male but gendered. Presently, we will see this as part of contingencies that are made part of a situation, as resident principles, where recruitment easily will produce a gender-bias if not taken actively into consideration.

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Which means that we would take into consideration all the factors that keep operating, as long as the silence around them remains unbroken. The cosiness that makes people make each other feel at home, therefore also constitutes the means by which social homogeneity—whether based on gender, group or age—somehow always ends up reproducing itself. Moving from the Eno/Schmidt card to precept 11. in Norman Potter's list, I am led to an ironic/sarcastic interpretation of "don't break the silence". Or, even better, by taking in a rule set against discrimination as constraints, I can move to the silence language of response. I can respond in a more creative, and less conservative way, by in my modes of somatic attention. That is, the repertoire of the body-to/body communication.

Be dirty

necessarily explained in terms of coolness but which nonetheless seemed to be an important driver in structuring what people got from participating in hacker and makerspaces. This was a desire to be hands-on: to actually engage with the messy, resistant physical stuff of the world around you. Some people, at least, were drawn to hacker and makerspaces exactly because they offered a focus on physical materials, creation and community that stood in contrast to their increasingly digitized and mediated experience of everyday life.

While hackers and makers didn't tend to draw a sharp distinction between computer-based hacking and more hands-on making or hacking (those in hacker and makerspaces were often involved in both), they did at times talk about an over-engagement with the digital that led

them to the pleasures of making. There were a number of IT professionals amongst our interviewees; one explained that his 'after-work interest is in physical stuff' like soldering electronic systems or making a robot rather than in the computer work he spent his days doing. Exactly because these individuals already spent their time coding – something which made them an important resource for the hackerspace – they liked to immerse themselves in making and creating physical things.³¹ More generally, people spoke of the value of a space where they could get their hands dirty and thereby learn, know, in a different way. You need, one hacker told us, to 'tickle the parts of the brain that are not satisfied with a completely virtual pursuit'. Someone else, whose previous creative

OK, so the people who have access to the digitised middle class with remote access to the world, also want some dirt under their finger-nails, which is a topic we find covered in *critical theory* in France from Sartre, Balibar, Kristeva, Irragarey, Xisou and Badiou to Bourdieu and Touraine. I am often wondering whether the Anglo-American world are ignorant of historical precedents, or simply choose to look past it (so that the world starts/ends with the Anglo-American world) and is correspondingly centred around it. A case in point if, of course, the total lack of reference—in Sarah Davies' book—to Charles Fourier's utopian idea of a Phalanstère, where the ideas animating the maker-movement were expanded to the life-style of an entire community (on display). This was in the wake of the French Revolution in the early 19th century. Been there/done it. Usual European response.

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T (SPECIFIC)

But then the question would be what I would put on the top of my list if the maker-movement slogan—'do something'—is to run clear of both the power of markets and bureaucracy, which is clearly to celebrate a power of doing that is neither pledged to develop new products, nor to boost the national economy, but to provide a space with access to people and equipment, in a similar way that one would have access to books and a good reading-environment in a public library. Which means that avoiding the mentioned pitfalls would make it to the top of my list. Because people, equipment, practices and activities come first, the priority of developing non-discrimination practices (gender, group and age) would fall on the list, likely to the bottom. Unless they are incorporated as means, making them part of the job itself, to reach/maintain the top priority.

13. Refer always and at all levels

Make an exhaustive list of everything you might do and do the last thing on the list

and repairing his car: 'I feel', he says, 'that if I know how things work, I have more control'.³¹

The irony is, of course, that these efforts to escape the power of markets and bureaucracies are themselves constantly being commodified – with the 'Do Something' campaign being a case in point. However laudable the campaign's aims, and however helpful its tips and suggestions, the *Guardian* is selling itself (boosting sales and circulation) by selling a particular version of its readers. It strokes our egos, entices us with potential lifestyle changes (I've definitely been seduced by visions of myself as a committed aqua-hiker, jam-maker, or successful internet dater), and turns us into ever more committed users of the services the *Guardian* provides. However counter-cultural the thinking behind DIY is, then, it is

constantly being absorbed back into the market and turned into something that can be consumed. TV channels broadcast home renovation shows that allow us to passively consume the DIY vision without doing any of the work. Hobby stores sell products, from kits to tools to materials, designed for crafters and DIY-ers, often with marketing and branding targeted at this type of consumer. And online retailers such as Etsy allow people to purchase 'artisan' products, and thus buy into the lifestyle of the crafter, while simultaneously boosting capitalist markets (Etsy is a for-profit business). One scholar of DIY distinguishes between 'pro-active' and 're-active' forms of DIY, the latter involving 'activities mediated through the agency of kits, templates or patterns and involving the assembly of

3. Find them where they belong—in the job itself

Remember .those quiet evenings

Makerspaces often have a similarly generous definition of what can go on inside them. It is, however, much harder to trace a specific history to makerspaces. There's no clearly defined origin story, as there is with 'Hackers on a Plane' for US hackerspaces, and the very openness of the term – making, after all, could imply all kinds of very different activities – means that it tends to be used as a label for a more diverse range of spaces, with a wider range of histories, than hackerspace. Though it's not a trademarked term, the notion of a 'makerspace' is often also implicitly associated with *MAKE* magazine and the suite of commercial enterprises related to it (including the online community makerspace.com). *MAKE* was started in 2005 by Dale Dougherty, who had previously been involved in tech

publisher and mover and shaker O'Reilly Media (the business that popularized the term Web 2.0).²⁰ The magazine, Dougherty writes, was inspired by mid-twentieth-century publications 'like *Popular Mechanics*, which had the attitude, if it's fun, why not do it?'²¹ It is, as its name suggests, all about making. It features instructions on how to make anything from bamboo hors d'oeuvre trays to handcrafted drones, alongside stories from inspiring makers, product reviews, and features and facts. The magazine led to Maker Faires (the first took place in the Bay Area in 2006), a now global phenomenon where everyone from garage tinkerers to budding entrepreneurs and established commercial operations set up stalls to showcase their wares – or, more accurately, what they have made, as

4. Expose the elements

Be less critical more often

hackerspace. It needed to be clear, Nick said, that their space didn't 'have a unified point of view and that individuals are free to do what they want'. The hackerspace was thereby viewed as politically neutral, somewhere that Democrats and Republicans and anarchists might rub shoulders without their different views becoming an issue.²⁴ A few people told us explicitly that what they did was different from more 'political' versions of hacking. This tended to be based on a distinction made with hackers and hackerspaces, in Europe or elsewhere, which were overtly part of an actively resistant counter-culture. This was fine, people said – but it was not for them. 'We're very much a hackerspace', one hacker, Dan, told us. 'But we're also not because we don't have a lot of the cultural political baggage

that a lot of the hackerspaces have.' Dan's space, he told us, didn't want to be a 'cause'. They didn't want to get distracted by wider social or political projects as some other hackerspaces had been; for them, the emphasis had to be on making stuff (and on building a community based around these activities: they saw themselves as a 'clubhouse'). Because of this they occasionally got some pushback:

Well, we'll get some people from some European countries coming in, like, This isn't a hackerspace. I know what a hackerspace is. Our hackerspaces are political. One of our earlier members, he's Austrian and his wife is involved at Metalab, the hackerspace. You know, where this current trend has started from. And they're very much – they are active. They are

14. Reach out—nothing to be self-contained

There was nothing like the dinner-table in my family to run through a variety of topics, turning them—at least apparently—in every conceivable angle. The topics would range from details of musical interpretation, to the twists and turns of Norway's foreign policy. After dinner—before bed-time—my mother would write extensively about the details from that day, in her diaries. She produced 71 of them in her lifetime. I am thinking of this when imagining the maker-spaces in Sarah Davies's book as places with the quiet hum and buzz of collective activities, with similar multiple trails to a dinner conversation. Like a daily thing, where magazines enter into that quiet stream of activities, rather than being tied to the yelling crowd of global journalism. There are not only accelerated/accelerating market places, but also more quiet ones. *MAKE* magazine is one example, *B-* magazine another.

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But I am critical of spaces where the people who engage think that they somehow are neutral. But who am I to doubt that the value of maker-spaces as politically neutral grounds—especially if referred to the divisive political sentiments that currently run the streets in the US—not only as a time-out, but a time off burning political issues, that develop constructive interactive skill-sets badly needed in a democracy. Historically, after all, this is why the guilds—when they had ceased to play their economic role in organising the Mediaeval trades—outlived themselves, to provide the Masonic ground-principles that was adopted as civil rights during the French Revolution, and that we know to this day as 'liberty, equality and solidarity'. The Austrian politician and his wife, who were members of the Metalab (a maker-space) is a case in point. Perhaps it is important that we keep that in mind.

Courage!

15 <http://bollier.org/blog/morozov-maker-movement>. Others have similarly questioned the techno-utopianism inherent in discussion of the making 'revolution'. For a discussion of how this relates to 3D printing, see <https://modelviewculture.com/pieces/questioning-the-3d-printing-revolution>

16 Lindtner, S., 'Hackerspaces and the Internet of Things in China: How makers are reinventing industrial production, innovation, and the self'. *China Information* 28(2), 145–67, 2014. See also <http://www.3ders.org/articles/20111124-hackerspaces-in-china.html>

17 http://en.cncnews.cn/news/v_show/43702_2014_Beijing_maker_carnival.shtm

18 <http://hackaday.com/2011/11/27/chinese-hackerspaces-or-what-happens-when-a-government-is-run-by-engineers/>

19 Lindtner, 'Hackerspaces and the Internet of Things in China'.

20 <http://www.wsj.com/articles/SB10001424052702303722604579111253495145952>

21 Though see the debate in the comments here: <http://hackaday.com/2011/11/27/chinese-hackerspaces-or-what-happens-when-a-government-is-run-by-engineers/>; strikingly, one comment reads, 'this is a hacker sight [sic] and it is not in our area to discuss politics'.

15. Be functional—all parts must work for their living

Don't be frightened of clichés

This centralized approach means that DIY bio activities do not always necessarily intersect with the wider hackerspace movement. Instead – and despite a widely shared desire to open up biotechnology to those outside academia or big pharma – biohacking spaces often have formal or informal connections to universities and private companies. Users of DIY bio spaces may have backgrounds in studying or working in biotech, but use these spaces to pursue side projects, develop their own spin-offs free of university intellectual property (IP) regulations, or, if they are students, get access to hands-on research. DIY bio is viewed as citizen science: there is suspicion of the limiting effects of institutional bureaucracy, the crushing weight of the requirements of commercial biotech, and the cramped nature of

contemporary scientific funding. It is thus about escaping the limitations of institutionalized biology, alongside educating the wider public in its tools and techniques. But it also has well-established links to government and regulators, particularly in the US, where a good relationship with the FBI has ensured that some of the early DIY bio spaces (such as GenSpace in New York) have survived and flourished. Finally, DIY biologists are often committed to open-source innovation, and to entrepreneurial activities (an interest in many biohacking spaces, though not a universal one) that utilize models of open IP or copyleft licenses.

Making a movement

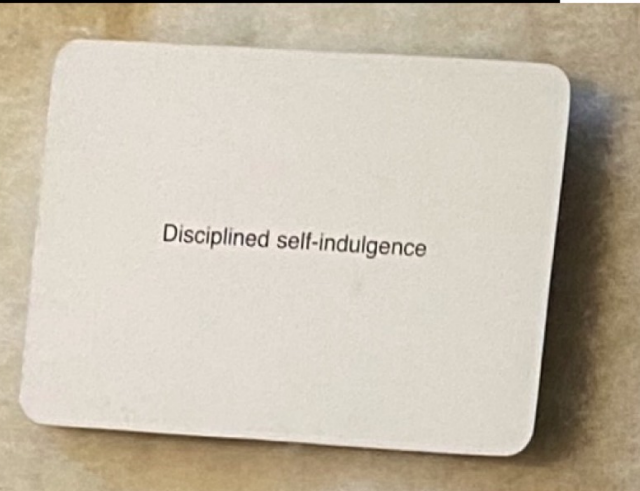
The maker movement thus captures a set of

5. Imply the components

It always takes a special kind of courage to land on pages like this, which in this book is located at the end of each chapter. Unlike book-references (that make you say to yourself 'later, when I have time' [but perhaps knowing that you will not have time]) this volume is equipped with a remarkable number of URLs that of course are *active* if you read the book in a digital format. So, the distance is shorter and one is indeed invited to the often rare occasions for source-criticism. The links covering Chinese maker-spaces, are significantly linked to press coverage. So, although they say things on Chinese maker-spaces that make them stick out from Western ones (in being more inclusive at the human, and even animal, plane [mainly dogs]), the knowledge is at the distance of news coverage, and not to the same extent tied up to Sarah Davies own interviews and fieldwork.

————— $\frac{U}{T}$ (SPECIFIC)

At the risk of catering to clichés—which we should not be afraid of—I would add that the kind of activities found in a sub-strand of maker-spaces, for instance those linked to bio-hacking, come close to the kind of research arenas that designers are likely to access in their professional life: that is, research that is free of the strings of Intellectual Property Rights claimed by Universities, and those of private/corporate funding. That is, the kind of research that goes on alongside academic research, but ranking as applied research. The contributions from these arenas are typical open source, copy left, like Creative Commons. This might not be due to the professional level, or advanced-ness, of the research, but to how knowledges, practices and a variety of fields are entangled in this realm of research. The form of ownership reflects the way the elements are entangled components.



Disciplined self-indulgence

has written a blog series on starting a hackerspace,² and John Baichtal, in his book *Hack This*, has a whole section on developing your own hackerspace.³ Rather than repeating this, this chapter looks at how this kind of advice is used in practice by hackers and makers on the ground. It focuses on what we were told about the origins and organization of the hacker and makerspaces we visited, and the kinds of norms and attitudes that hackers saw as important in this. It explores the work that goes into making and maintaining a hacker or makerspace – the processes that are the ‘behind the scenes’ of cosy hackerspace caves or echoey ex-factories.

Origin stories

How do hackerspaces start? One of the first

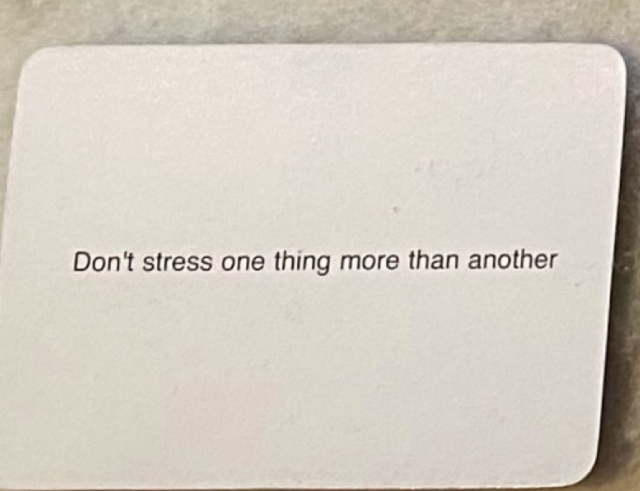
spaces we visited, in Arizona, was relatively well established. It was some three years old at the time we visited, and Yan, whom we interviewed there, was one of its founder members. For him, the hackerspace first started to emerge into reality when he visited DEF CON (the hacking conference that also led to the Hackers on a Plane trip) for the first time:

So actually I went to my first DEF CON in like, I want to say '08 or '07, and I went with one of my peers from college, a fellow alumni. [...] I met some people from Phoenix and we exchanged cards or whatever. And we got back and we were like, That was really awesome. How come there's nothing like that in Phoenix? Because literally the other techies I knew in Phoenix were my coworkers in the IT department and some

The application of the ‘disciplined self-indulgence’, encouraged by the Eno/Schmidt card, I find applicable (at least partly) to the situation of *someone who wants to learn from the maker-movement*, starting with one’s own working station. A situation which I am sure many of you can identify with. So whether you muscle up with your own equipment, materials and space, or you do it at school, it is a way of getting oneself into the *driver’s seat*. Starting with your desks in the MA-room. How does it need to look and work to be part of a KHiO-map, that includes a smaller or larger share of the workshops to which you have access and will use while at KHiO. There have been students who are certified as users near all the workshops. What is the system of relations and deals that makes KHiO function as a maker-space. This is how you can look at the maker-space as discourse.

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I remember a story about [William Burroughs](#) according to which he sad that his ultimate sense of freedom, would be to walk around in an airport, throw away all passports, and buy plane tickets to all destination. A tremendous sense of potential. To be an allrounder in KHiO’s workshops could conjure a similar potential. *Not to stress one thing over another*. And it may be a cultural trait of the maker spaces, is that what they have to offer is a *new beginning*. However, as they specialise, like what appears to be the case of DIY bio-hacking in Sarah Davies’ book, they would seem to do justice of a narrower field of search, than one ideologically locked to the entire spectre of possibilities. So, this may be one reason why hacking and making has depended on being *new* (though historically it isn’t) is to stress the options more than the development of a repertoire of knowledge.



Don't stress one thing more than another

engagement with the material world. But no one is claiming that involvement in a quilting circle is going to prompt a new industrial revolution.

This raises the question of the newness, or otherwise, of hacker and makerspaces themselves. Certainly, the spaces themselves are new. I’ve talked about the meteoric growth of hacker and makerspaces in North America and beyond: around 30 worldwide in 2007; almost 500 in 2011; 1,233 active spaces when I checked on [hackerspaces.org](#) in 2016.⁴ Businesses like TechShop, MAKE and other makerspace franchises have emerged over the last decade. The terminology of hacker and makerspaces and that of the ‘maker movement’ is certainly an innovation. But are the practices that these spaces host anything different from

those found in other kinds of craft or making-oriented associations? Is the sociology, the way in which hackers and makers interact with each other and with their tools and projects, different – or are hacker and makerspaces old wine in new bottles?

The novelty of hacking and making

Plenty of people have argued that the rise of hacker and makerspaces does represent something dramatically new. For many proponents, the maker movement is both a discrete, clearly identifiable development and a step-change in how entrepreneurship and innovation are imagined and carried out, something that is radically different from what has gone before. One academic analysis of current discussion of the maker movement

Don't be afraid of things because they're easy to do

anyone, in other words, could say that they didn't feel comfortable with that person becoming a member and the membership process was stopped there. This, Nick told us, ensured a community in which everybody liked and trusted one another – where people were comfortable with everyone else to the extent that 'you can give your apartment keys to them'. Other spaces tended to have less explicit blackballing systems, but still operated a membership process in which new members were voted in (or not). The emphasis was thus on relationships. Did the potential member seem to have the right attitude to the space? Did they do crazy stuff that might have hurt other people (like using equipment wrongly)? Did they get angry, or get on badly with others in the space? Ultimately, the key question was:

did other hackers and makers want to share the space with them?¹²

There was thus a strong sense that membership of a hacker or makerspace was a privilege that shouldn't be taken for granted. It wasn't always that easy to get in, and it was also a privilege that might be revoked if the hackerspace felt that was necessary. There were times, our interviewees told us, when it had been or might be necessary to discipline or throw out members. This could be a vexed issue within a do-ocracy. How should the decision that somebody had crossed the line, and needed to be excluded, be made within an open, grassroots-run space?

Hacker and makerspaces generally tried to keep rules and bureaucracy to a minimum. Though

7. Be clear full spare consistent and sufficient

Things that come easy with some people—like trusting the keys of your apartment and that they will not be a danger to others in the use of (dangerous) equipment—often comes out of a rather complex chemistry at a relational and practical level. Which is why we may not need to be afraid when things are easy. They often hatch from deep assessments that we call gut feeling, and/or intuition. The *do-ocracy* Sarah Davies uses to conceive the maker-movement ideologically, is manifested by not engaging in long and painstaking discussions, but at the first opportunity *to do something with a problem/topic*. When triangulated with Norman Potters injunction to 'Be clear full spare consistent and sufficient' this is clearly along the same lines (though formulated in his British idiom of English, where everything is a bit convoluted and local, but the values expressed are similar).

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In its basic grund-definition the term 'hacker' is a denomination that is somehow tied to digital technology, because it originated with computers. If you define making—in the sense explored by Susan David in her field-inquiry—as 'hacking in the expanded field' it starts to have a ridiculous sound to the more engineer minded members of the maker-movement. As a definition, it is more taut than tight (NP), since hacking then determines an experimental path of exploring the world, in which computers (and some computing) is somehow integrated. Which is a pretty wide range too. It is really two different things to have concepts with a wide reach—yet with a certain cogency—than concepts that are widened in such a way that they end up all over the place. This is really something to consider when you consider what is your 'potato' (or, in this case, your digital tech).

You are an engineer

food, suggested the writer, is not hacking:

I get the impression that people who call themselves 'food hackers' call themselves that because they want to be considered a part of the 'hacker movement'. Why don't those of you who identify with this moniker just call yourself a 'cook', 'chef', 'baker', 'maker', or whatever instead? Why don't you instead call the food 'food' or if you really want it to be associated with the hacker scene, 'food for hackers'? Is that hard? You're not a hacker and you dilute the term for those of us who are hackers.¹³

The author started their message by citing a definition of hacking that referred to computers; for them, hacking was something that was highly delimited, and the term should

only be used to describe clever fixes and solutions in the context of computing.¹⁴ As such, they were annoyed about what they saw as the proliferation of the term where it shouldn't be applied: anyone who picked it up and used it in other contexts was 'diluting the term'. These people should ask themselves why they were so eager to call themselves hackers. 'Why', the poster wrote, 'do people who are playing with their food want to be a part of the hacking scene?'

The resulting discussion thread involved some 70-odd messages, variously rejecting, supporting or commenting on food hacking and the notion of hacking in general (with many of the messages comprising a back and forth between the original poster and their critics, including various comments on their

17. Be taut but not tight; the work must breathe

Cut a vital connection

What emerged as we talked to more and more hackers and makers was a kind of constellation of attributes that were seen as related to hacking but which bled through into people's whole lives; together, they can be taken to represent a kind of 'hacker spirit'. I'll outline these characteristics in the sections that follow.

Making things

For many people we spoke to, an integral part of being a hacker was having the desire to create or make. It didn't really matter what it was you were producing; instead, the expectation was that you would follow your own interests and passions to make original and interesting stuff. This interest in being *generative* was seen as something that bound hackers together. You might make software or

you might make giant walking robots or you might make new organisms or you might make sculptural art – but basically you were someone who was interested in 'making new cool things' and 'being your own creator' (to quote two people we spoke to). You were creative rather than destructive.

Let's go back to Kip's experiences to see what that could mean in practice. Kip's interests, as a hacker, were primarily focused around electronics and programming (he described one of the projects he was working on as a kind of 'home-brewed server system'). But he told us about a time when he met a member of another hackerspace on a bus; they got talking, and were delighted to realize they were part of the same community. Kip was fascinated by this woman's hacking activities, which were totally

8. By pursuing your own interest you can generate collective dynamics: this seems to be a fundamental precept of the maker-creed. As this credo bleeds into your entire life—that is, your life-style as an individual and a community member—can lead you to cut connections that previously appeared vital to you. Or, at least, your relationship to family and friends can be deeply altered, through the experience of the personal ware & share that feeds an embodied sense of having a second life: not necessarily as a second chance, but in the sense of role-play and gaming. That is, when it ceases to be role-play and gaming, and becomes part of your flesh-and-blood because you have invested work, time and energy into it (and sometimes considerable amounts of money). The vocation of the privileged few—living to work, rather than work for a living—becomes available to a larger group.

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It would seem that the maker-space is tethered to the vitality of the community, and that if it does not perform at this level, then it falls apart. But still, from a critical point of view, we cannot abandon the maker to a social vacuum: what defines the maker when there is no one else around? If true to her own ideals one would assume that s/he would look around and say—there is no one else around; nobody to blame and nobody to fix things. So, it must start with me. Personally, I find this situation very interesting because it poses the problem of the relation between *homo faber*—the making human—and the beginning of society. Retracing one's steps and being literal (Eno/Schmidt and Norman Potter combined) seems to be at the crux of the matter: if you are literal and retrace your steps you will discipline yourself to be attentive to detail. At some point you will propose (not demand).

Look at the order in which you do things

degree that we were told that franchised or impersonal makerspaces were not 'real' hackerspaces because they lacked community. A hacker or makerspace could only successfully function, in terms of its governance and administration, if it had a committed, sharing community. Spaces struggled because their communities were not tightly knitted or proactive enough – because they fell back on the hierarchies of the outside world, or were not sufficiently 'grassroots' in their priorities and administration.

We have also seen that there can be pathologies of community within hacker and makerspaces. At best, there were issues where erstwhile leaders or officers found themselves 'forcing people to be grassroots'. Individuals took on what they thought were largely nominal

positions on a board or leadership group only to find that there was a constant struggle to encourage other members to step up, take decisions and live out 'do-ocracy'. At worst, community can function to exclude particular people, and to create a 'dominant culture' that is intimidating or unwelcoming. Many hackerspaces seem to fail at creating diverse community (just as the tech industry does more generally), an issue that has led to the rise of more focused communities that welcome those who are otherwise excluded or alienated. Community could even become a distraction. Some of those we interviewed spoke about their concerns that their space was too much a social environment, too much somewhere to hang out with your friends rather than a place to make and hack. Should hackerspaces be

collectives to cooperatively run businesses.

This sense of continuity with other groups made it all the more striking when hackers and makers told us that something was definitely not hacking or a hackerspace. In these cases talk of continuity and similarity came to an abrupt stop. A line was drawn in the sand: this thing, or group, or activity just wasn't about hacking, but something else entirely.

This happened, for example, when some people talked about TechShop. Dan was very clear that the TechShop located not far from their hackerspace was simply 'not a hackerspace'. It was:

membership tool access. But they don't have a sense of community that you find in a hackerspace. [...] It's a business. That's the

big line right there, is they're for profit. They're a business. They have a service they sell.

TechShop, Dan said, was a great resource: he was happy that they were there, and many of their members used it occasionally. But they were different to a hackerspace in two key ways: they were about making money and they lacked a 'sense of community'. It was the latter, in particular, that we were told again and again. Community is what makes hackerspaces special, and it's that which sets them apart.

We've already started to see this emphasis on community as central to hacking and making. Community, sharing and learning from one another are key aspects of the hacker spirit. In terms of organization, hacker and makerspaces

The card asks: "Where is the edge? Where does the frame start?" This is also Sarah Davies's issue in the two pages of this spread. How exactly should we understand when people whose notions are fairly large—or, extensive—when it comes to include a great variety, get to a point where they become categorically dismissive of having anything in common with actors like the TechShop. It is because they lack the community dimension altogether and come out as commercial tool-rentals. So, even if some maker-spaces occasionally earn—or, more routinely make money—the money-making aspect does not come out as the main thing. What we may want to *question*, however, is how the financial handling-capacity and turnover of a maker-space, articulates with the elements of clubbing, that we have discussed previously, that may work in exclusionary ways.

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Here Sarah Davies makes a beautiful connection between a point I made in my previous lecture on Norman Potter ("design probably not is a discipline with clear cut boundaries, but rather is defined by *a hallow of mindfulness around a practical core*. The latter being what *holds it together*") and the resource that maker-spaces has to offer in allowing you to seek—and realise—a sense of empowerment in your own life. It brings me back to my experience with PhD fellow in dance Brynjar Bandlien, for whom I acted as a discussant in his mid-term evaluation. How can someone working with design bring up a discussion with a dancer with a background from the Martha Graham dance ensemble? I did this by linking up with what the dancers were doing on the floor, with my own strength (which is writing). Ending up with generating a truly empowering surprise.

course. As a result, there are greater possibilities for choice in the conduct of relationships, but this has required intense and continual negotiation and decision-making.¹⁴

In a world in which we are expected to 'make our own opportunities' we are faced with continual choices – choices which are liberating, but which may also be overwhelming. What work should I do? Who do I want to be intimate with, and how? Where should I live? Ultimately: who am I? The hacker spirit, and its expression in the maker movement and related forms of serious leisure like DIY or crafting, fits squarely into these dynamics in that it can help individuals consider these kinds of questions. Hacking allows you to curate your surroundings,

tweaking your tools and technologies such that they are a better fit for your life.¹⁵ Crafting can enable you to 'find your people' and gain a better sense of your own identity. Web 2.0 platforms mean you can opt out of traditional broadcasting and become your own media curator and producer, personalizing the content you are interested in. DIY homeschooling or food production can allow you to ignore the mainstream and fit your family's education and nutrition exactly to your beliefs. These forms of active leisure thus continue our societies' emphasis on individual agency as the key way in which the world is made meaningful¹⁶ and, importantly, as something we can act upon to change.

Personal empowerment is a wonderful thing. Few of us would want to live in a world in

Remove specifics and convert to ambiguities

Distorting time

and equality, and even organize government; as such, they offer a kind of ideal type of how all citizens should behave and interact.

Hacking may be prominent right now because it feeds into some of the less savoury dynamics of our times: a focus on individual change over collective action; an emphasis on the responsibility of individuals with no appreciation of wider circumstance.²⁰ At the same time, it is impossible to doubt the enthusiasm, good-heartedness and generosity of the hackers and makers we spoke to. People were genuinely excited about the pleasures of creation and the possibilities of hacking the world around them. Whether talking about the pleasures of working recalcitrant materials or of doing messy community, hacking and making were practices streaked through with

joy. While the movement as a whole may resonate in surprising ways with mainstream economic policy, it is clear that, for those we spoke to, participating in hacker and makerspaces was experienced as emancipatory and personally empowering. Hacking had changed these individuals' lives by telling them that anything was possible, and they were eager to see others' lives changed in the same way. Taken together, however, the conversations we had reveal not just resonances with mainstream culture but a set of tensions that run through the growing movement around hacking and making. There are contradictions and questions that sit in the background of most hackers' experiences, barely visible in the everyday life of hacker and makerspaces. These tensions will, I think, force

20. Make, do, go; scorn to publish: encounter!

With regard to the individual commitment and collective investment that overall characterises maker-spaces, it seems that Sarah Davies does not really come to terms with it: whether she moves around in circles, or the topic moves up the rungs of a spiral for each of the (numerous) times the puzzle turns up in her mind as she writes herself through her subject matter. Which is maybe how it has to be when your method is to write about something by writing with it. So, I never manage to decide whether she is filling her chapters with pretty much the same point, or she is not thinking so much about the book—nor its chapters—and simply wants to progress in her understanding of the subject matter (in a similar way to something working in a maker-space, but with writing). In this aspect it is consistent. But the book grows apace with an awareness of making falling apart.

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In this spread we read about the organisational aspects of managing a maker-space: the flip side of the previously mentioned do-ocracy. Here the emphasis is place on the role of conversation and discussion in establishing a platform for what is to be done, sorting the odds and ends of activities in such a way that they can be effectively mediated by collaboration. There is even mention of a board (the members of which, as Winni in the quoted passage, are called *officers*). However, it seems that titles do not have a tight grip on a community based on active participation discussion and lack of hierarchies. The do-crazy—whoever acts first has overruled discussion—is a safety-valve that prevents this. What can we learn from this? Can we imagine a meeting that ends whenever someone is ready to initiate action, and not when you get to the bottom of the list?

Retrace your steps

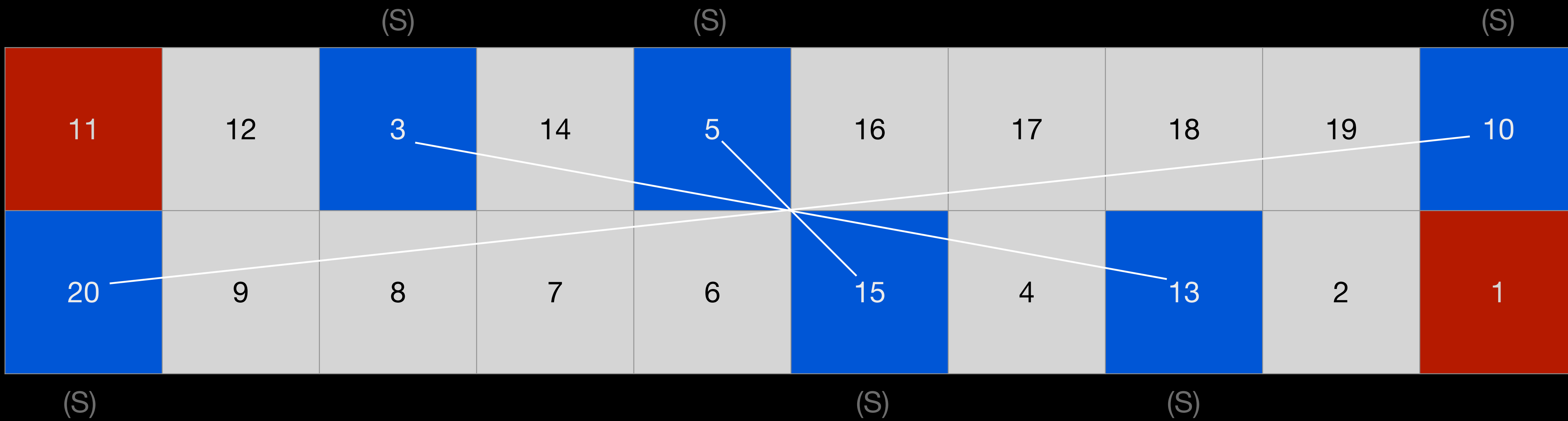
everyone was suddenly like a contributor.

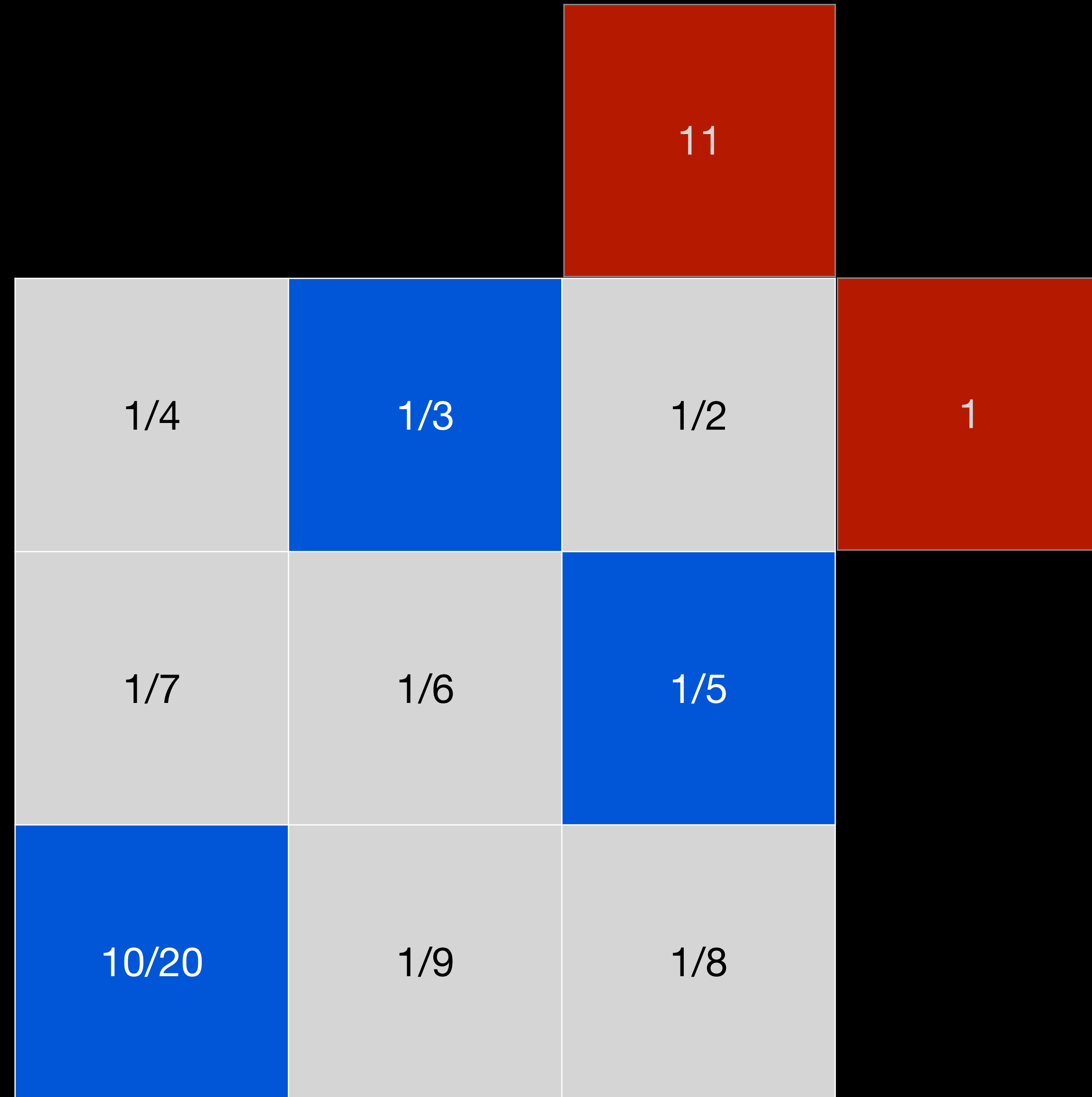
The fundamental thing about a hackerspace, Winni says, is that it is not 'a power pyramid... it's a space for all the members equally'. Again, this emphasizes the grassroots nature of the space – the fact that it has to be what its members demand of it. Her experience had been that stagnation in the space, and unwillingness for this grassroots nature to be lived out, was overcome by discussion amongst members. Just having a conversation made it clear that everyone had 'opinions and ideas', and, having expressed those opinions and ideas, people became more active contributors to the space. That one discussion, Winni told us, triggered a new sense of ownership of the space and with it a greater sense of responsibility. At that moment, at least, the

space was operating according to its implicit ideals. Its organization was centred around active participation, discussion and a lack of hierarchies.

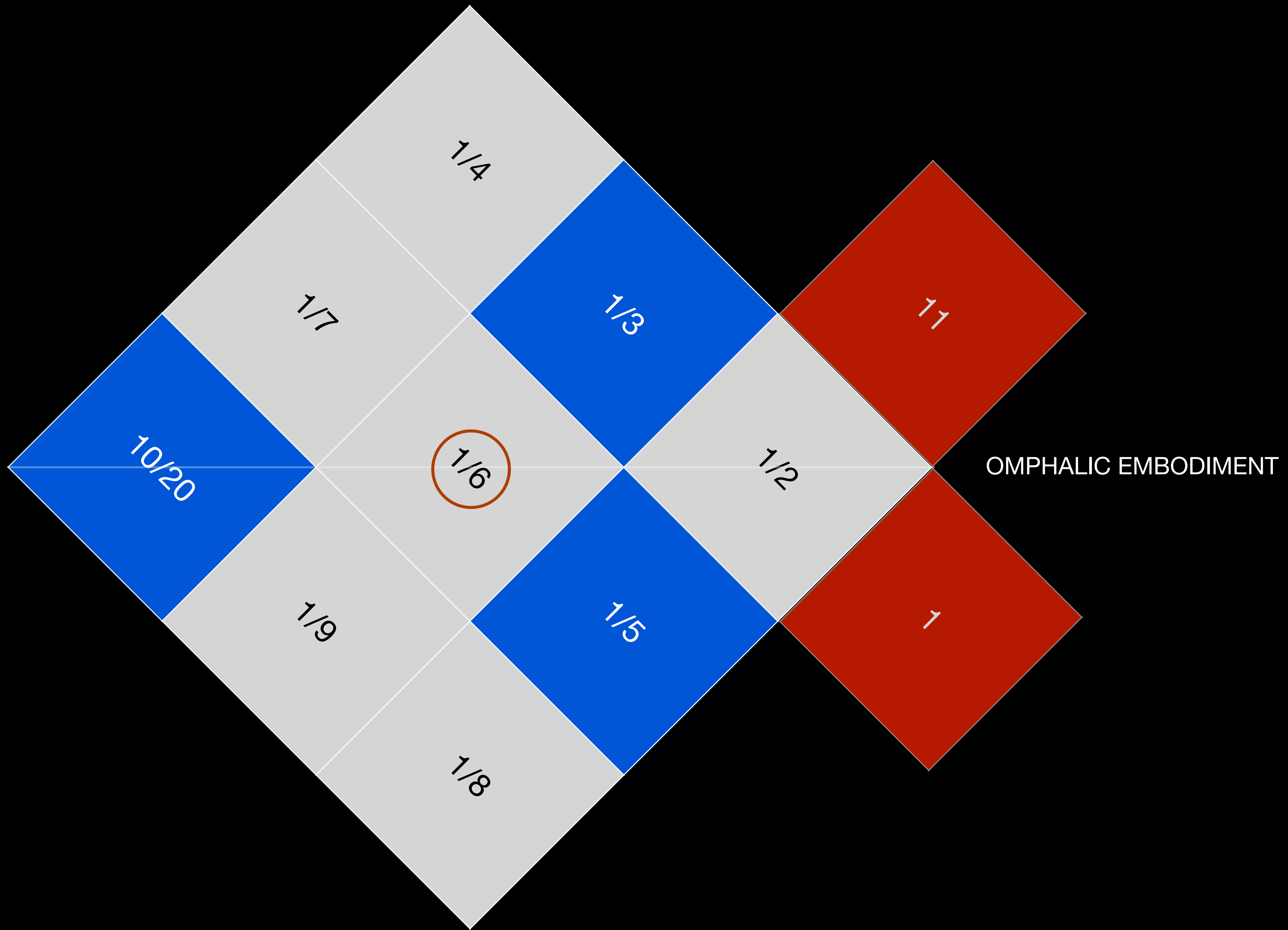
Meeting these ideals was a long-running issue. Winni's hackerspace had, like many others, a small elected board (the members of which were called 'officers') which was, at least in theory, a nominal position. She'd served on this for two years; ideally, she told us, she would have stepped down after a year but there hadn't been anyone to replace her.²¹ Winni was committed to what she saw as a 'hacker culture' of shared responsibilities and ownership, which she saw as empowering people to do what they wanted without worrying too much about what was allowed or not allowed. So she found the difference that

10. Affirm contingently





- ROTATION: the book is assumed to rotate around a core, and the core located somewhere *between* the beginning and the end (it is located by a WALK and Talk through the book)

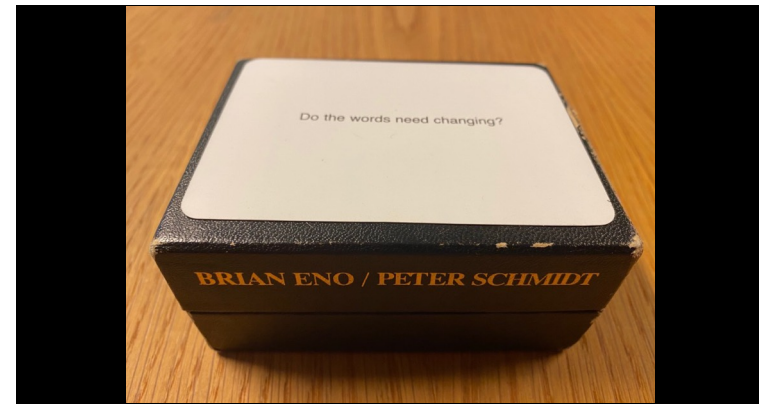




The combination of chance-methods with logical inference is what is used to define a 'game' in this series. The game is used to evidence some domestic structures that lay dormant in practices that involve human artefacts. It rests on the notion that some games are strategic applications.

They thereby constitute a category with the broader field of what has been previously discussed as techno-cultural devices. The type of game that interests us here is one that is bound to *random* samples, yet remaining obligated to *precision*. Indeed, this is game's defining risk factor.

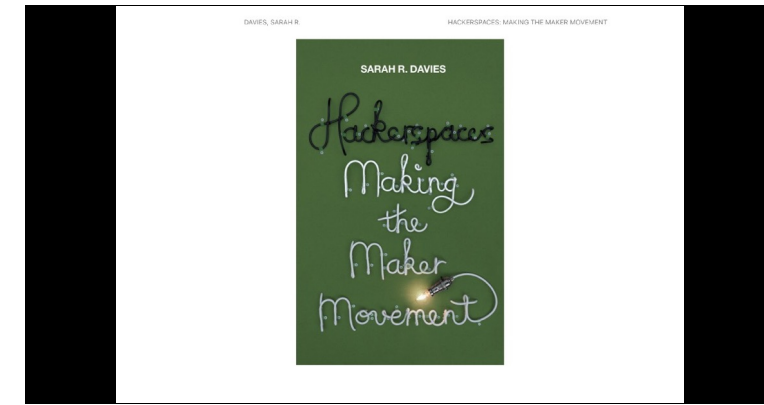
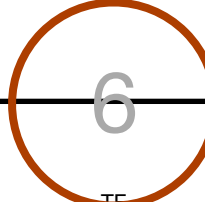
Precision is here used to define a relational qualities between performances that are heteronomously structured by different sets of rules. Which is why the subject matter of the game is the gap: or, the edgeland (determined, for instance, jointly by the perils of viral contamination and digital connection).



The norm-sets that are involved in gap-games need not be the rules of the game. In the test-game that I am homing in on, two sets of norms—selected from two different/gapped sources (a list of precepts and a card-deck)—are considered as affordances and resources/assets of the game.

The draw from the card-deck (Eno/Schmidt's *oblique strategy cards*) instructs one procedure, while the list of precepts is used to sign off from the task. The first procedure is called ENTER. The other procedure is called EXIT. The task proposed in the game placed between ENTER and EXIT.

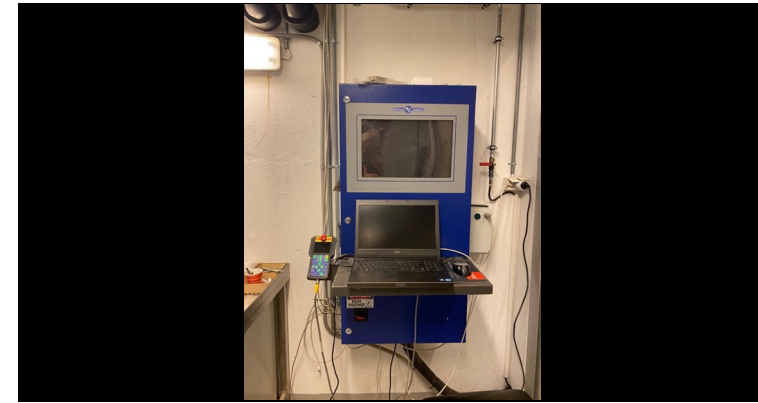
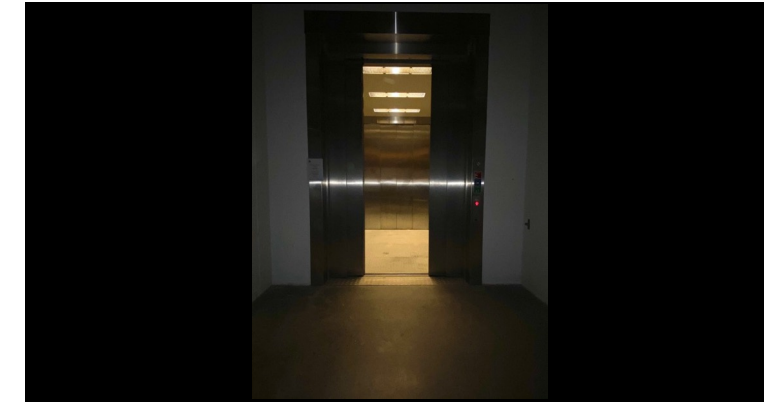
The task is to come up with a readable output from a book, based on a sample of 20 spreads. In addition to this, the task is to hatch a theory from the output, yielding a plausible synthesis with an original twist (departing from the simple summary). It should invite testing, as does a hypothesis.



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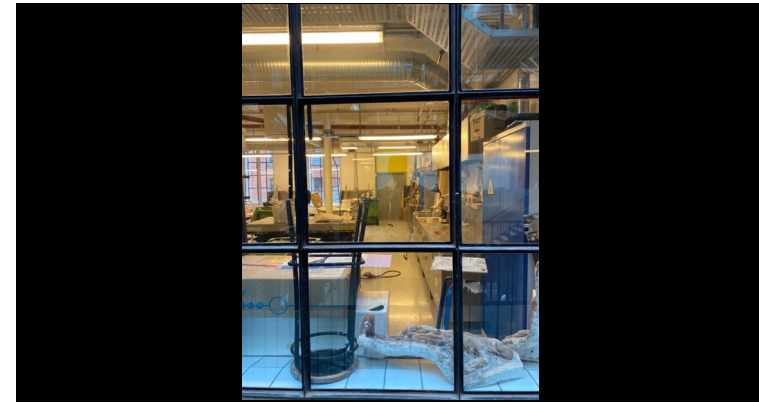
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The omphalos is a symbolic means to give a focal importance to the exchange between the reader and a book, whereby a book—which is acquired as an object—is embodied: that is, transformed to convey the extended sense of bodies (like heavenly bodies)... as in times of old.

That is, a reader can reliably expect that embodiment will take place, from the point onwards—in the reading—at which s/he intercepts the book project. Which, when it occurs—usually some point after the middle—succeeds at making the book applicable in the reader's environment.

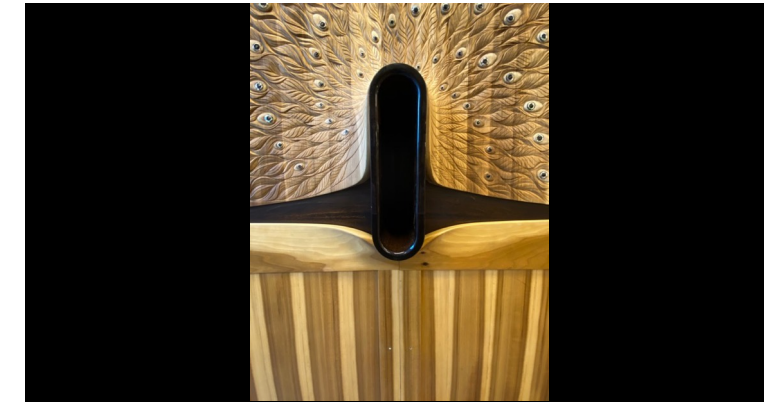
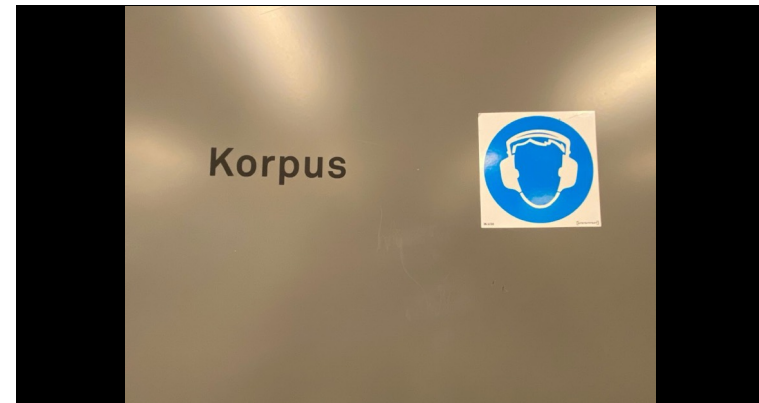
Embodiment thereby constitutes a case of point of programming, in Karl Gerstner's sense of the term. That is, the outcome of gap-gaming doesn't solve a problem to be fixed, but programmes for solutions. Programming, in this sense, is a category of design-work which is virtual and actual/neither.



Sarah Davies book *Hackerspaces* (2017) has a wide domain of application—if making in the sense of maker-spaces is expanded to knitting groups and sour-dough baking—and a narrow domain of application, when making is restricted to hacking, when linked up with/implicating digital technologies.

Between them lies the question of how muting/voicing gender, group and age affects the recruitment pattern and articulating the politics of different maker spaces. The question is how this affects the design—plan and purpose—that programmed the qualities of the maker-space at the outset.

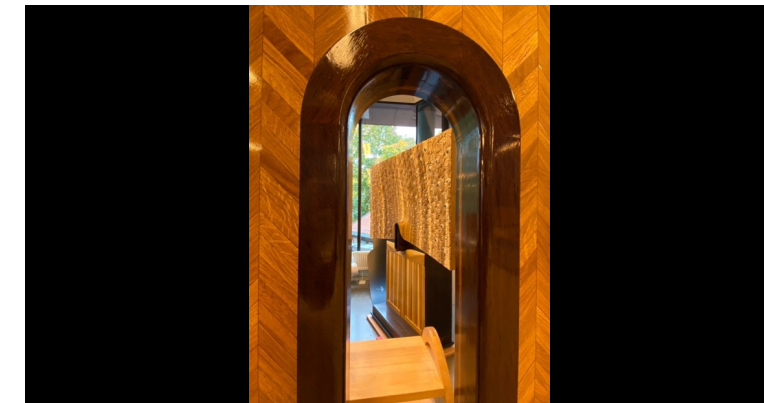
A way of seeing the value of the variety—in gender, ethnicity and age—is that it works as a randomising agent, rather than a vehicle of group politics. I.e. if the virtue of chance methods is that they will tease out the cohesive qualities of practice, as the foundation of the maker-space experience.



In the phenomenology of *embodiment*—the interaction and exchange leading up to apprehending object as a *body*—there are some basic mechanisms suggested by Johani Pallasmaa in his little book devoted to the *eyes of the skin*. It features the mechanisms of the *haptic* sense.

The first step is to conceive that all the *other* senses—vision, hearing, smell and taste—are *derived* (and specialised) from the haptic sense. Then the haptic sense thereupon comes in as a connector *between* the other senses. As a consequence they are available to a variety of changing contracts.

The variety of such contracts become part of our *sensory history*, that co-evolves with knowledge (including its *rational* aspects). The conscious work to develop *intuition* across this *gap*—as a foundation and a connection—is the purpose of the *gap-game*, and the prerogative of the *learning theatre*.



Does the series (#01–#06) live up to the standard of Norman Potter's Literalist precepts?

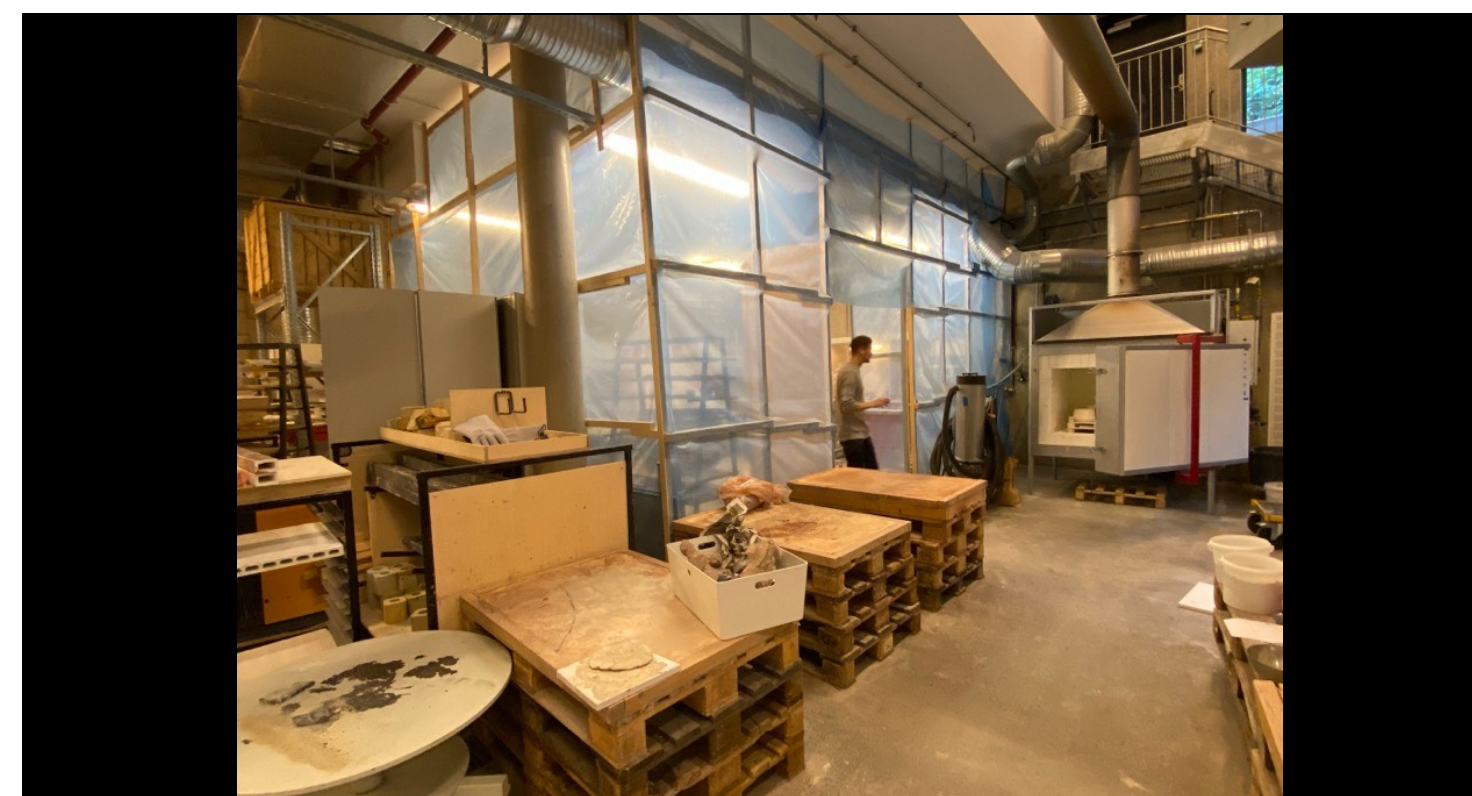
1. Begin at the beginning; a fresh start
2. Seek always the resident principles
3. Find them where they belong—in the job itself
4. Expose the elements
5. Imply the components
6. Propose discourse
7. Be clear full spare consistent and sufficient
8. Take pains
9. Ask questions
10. Affirm contingently
11. Contingency respects situations [a must? NP]
12. Equate means, constraints, opportunity, response
13. Refer always and at all levels
14. Reach out—nothing to be self-contained
15. Be functional—all parts must work for their living
16. Be just, and let justice be seen to be done
17. Be taut but not tight; the work must breathe
18. Be literal; there must be nothing else
19. 'It was so; I was there, and I saw it'
20. Make, do, go; scorn to publish: encounter!

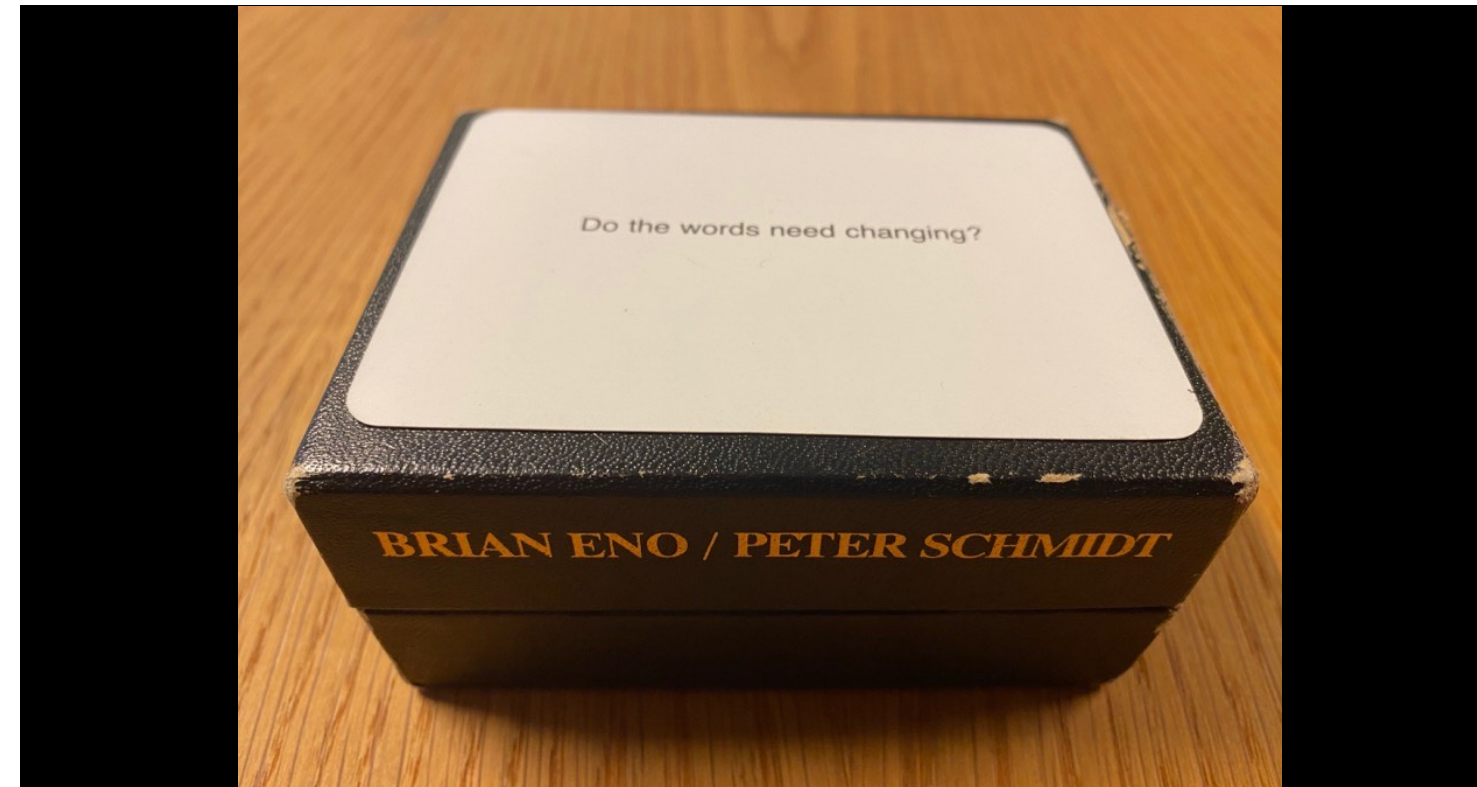


The combination of chance-methods with logical inference is what is used to define a 'game' in this series. The game is used to evidence some domestic structures that lay dormant in practices that involve human artefacts. It rests on the notion that some games are strategic applications.

They thereby constitute a category with the broader field of what has been previously discussed as techno-cultural devices. The type of game that interests us here is one that is bound to *random* samples, yet remaining obligated to *precision*. Indeed, this is game's defining risk factor.

Precision is here used to define a relational qualities between performances that are heteronomously structured by different sets of rules. Which is why the subject matter of the game is the gap: or, the edgeland (determined, for instance, jointly by the perils of viral contamination and digital connection).

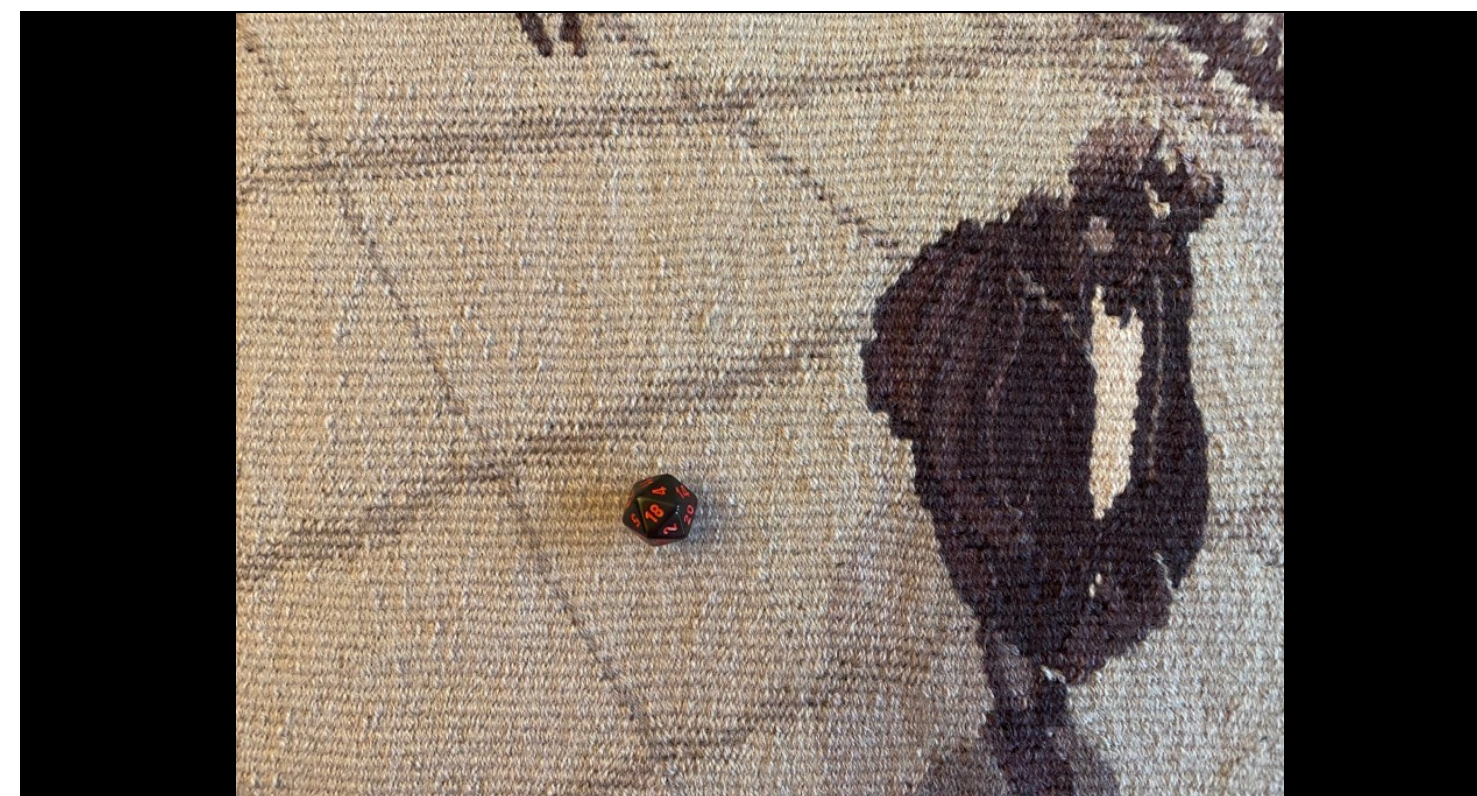




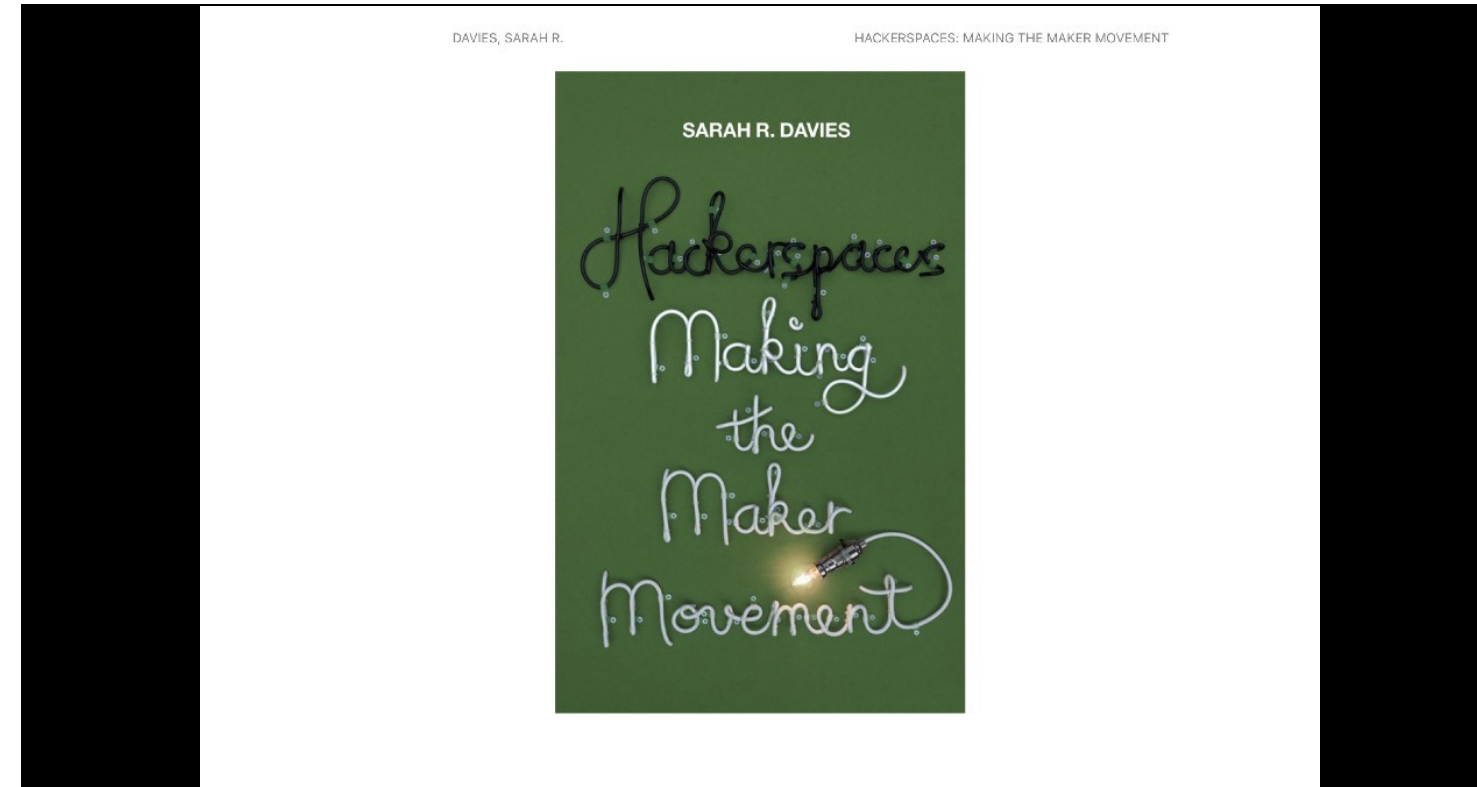
The norm-sets that are involved in gap-games need not be the rules of the game. In the test-game that I am homing in on, two sets of norms—selected from two different/gapped sources (a list of precepts and a card-deck)—are considered as affordances and resources/assets of the game.

The draw from the card-deck (Eno/Schmidt's *oblique strategy cards*) instructs one procedure, while the list of precepts is used to sign off from the task. The first procedure is called ENTER. The other procedure is called EXIT. The task proposed in the game placed between ENTER and EXIT.

The task is to come up with a readable output from a book, based on a sample of 20 spreads. In addition to this, the task is to hatch a theory from the output, yielding a plausible synthesis with an original twist (departing from the simple summary). It should invite testing, as does a hypothesis.



2

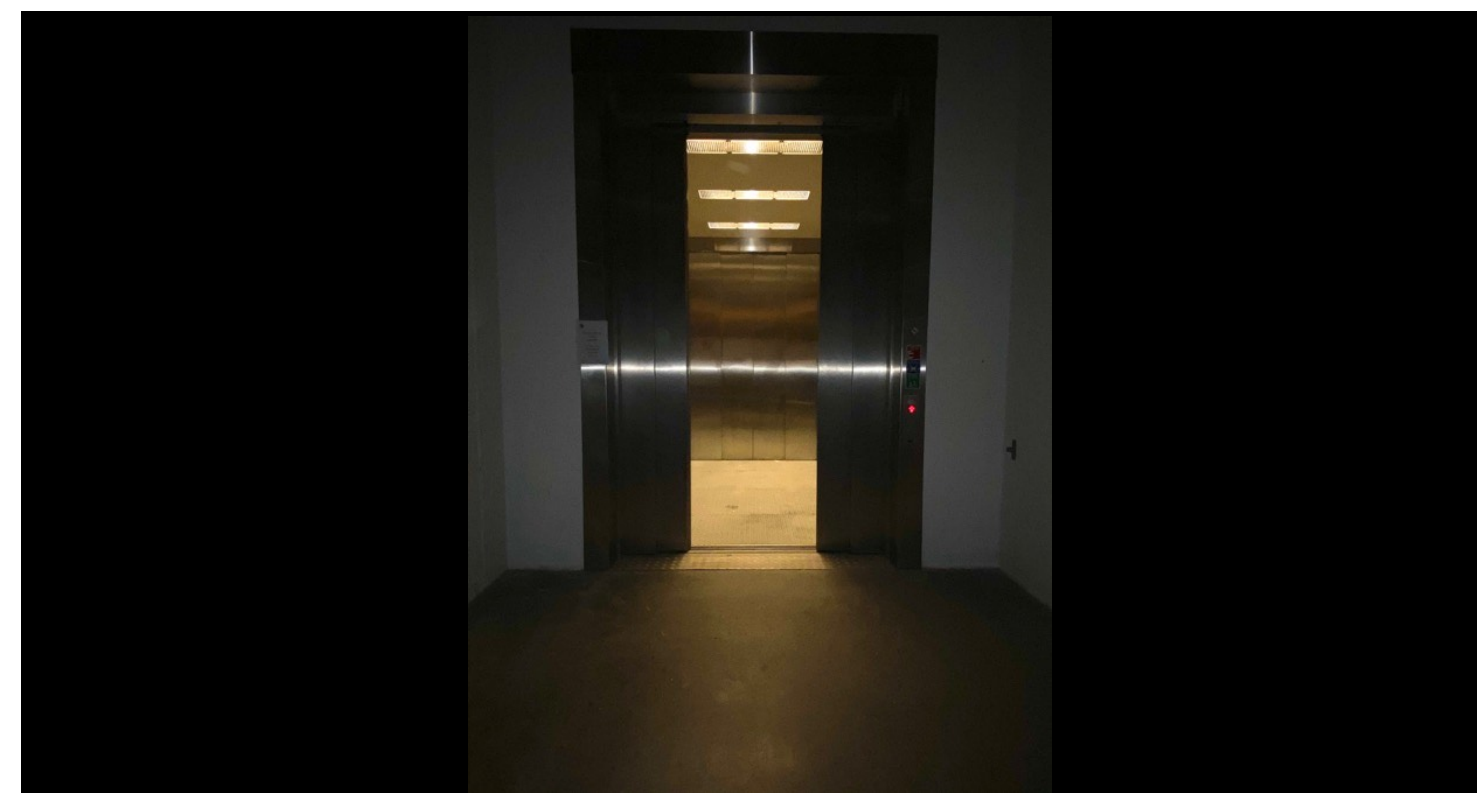


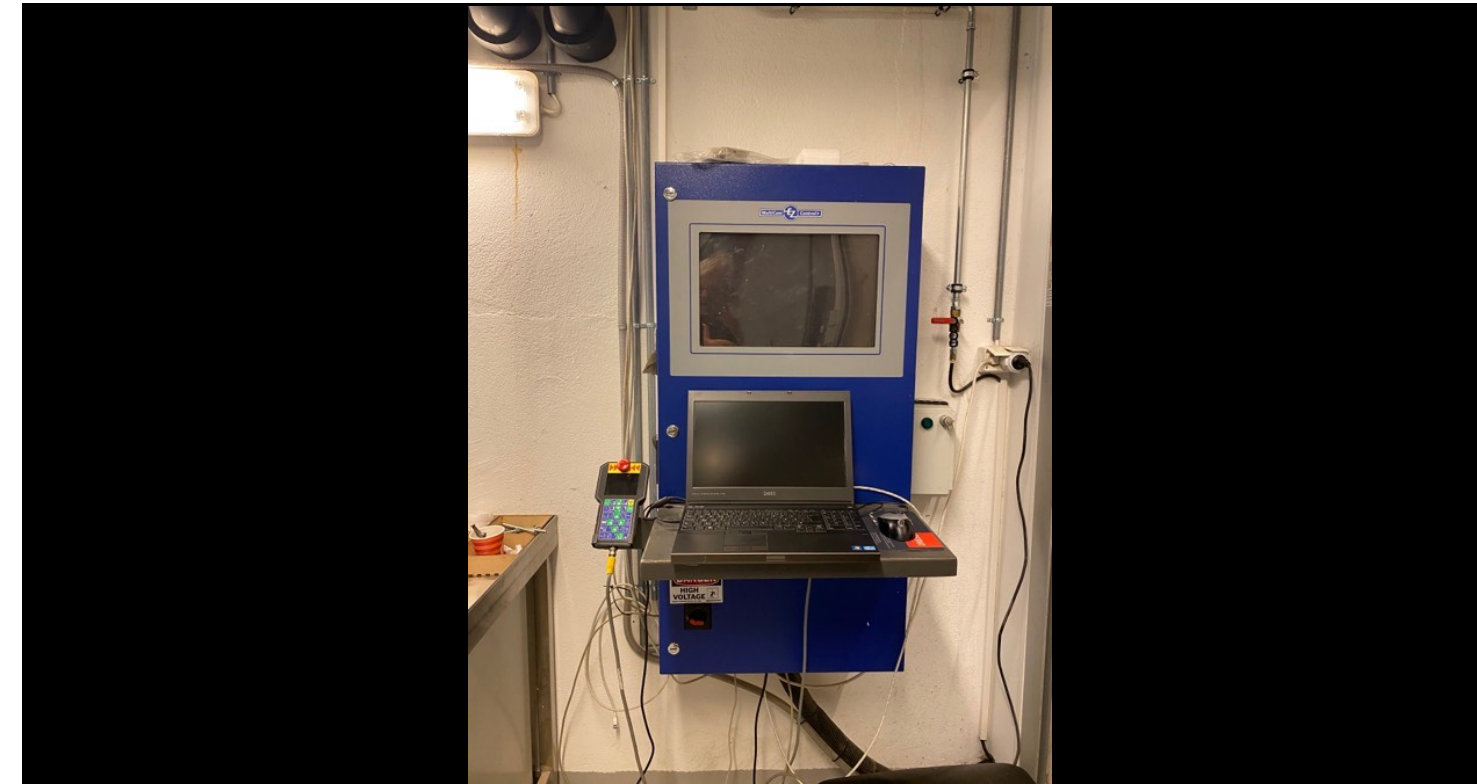
3

The norm-sets that are involved in gap-games need not be the rules of the game. In the test-game that I am homing in on here, two sets of norms—selected from two different sources (a list of precepts and a card-deck)—are considered as affordances and resources/assets of the game.

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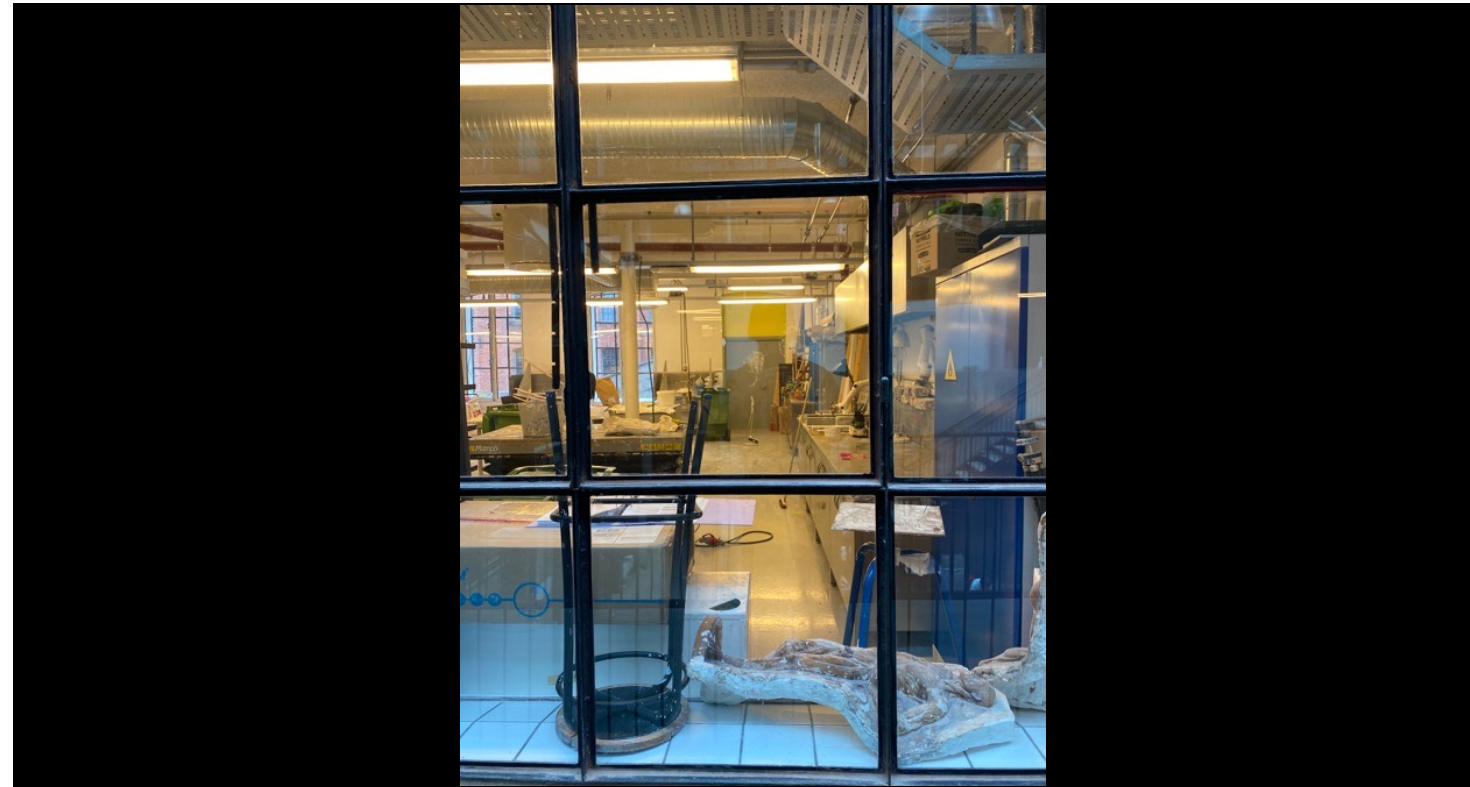


The omphalos is a symbolic means to give a focal importance to the exchange between the reader and a book, whereby a book—which is acquired as an object—is embodied: that is, transformed to convey the extended sense of bodies (like heavenly bodies)... as in times of old.

That is, a reader can reliably expect that embodiment will take place, from the point onwards—in the reading—at which s/he intercepts the book project. Which, when it occurs—usually some point after the middle—succeeds at making the book applicable in the reader's environment.

Embodiment thereby constitutes a case of point of programming, in Karl Gerstner's sense of the term. That is, the outcome of gap-gaming doesn't solve a problem to be fixed, but programmes for solutions. Programming, in this sense, is a category of design-work which is virtual *and* actual/neither.



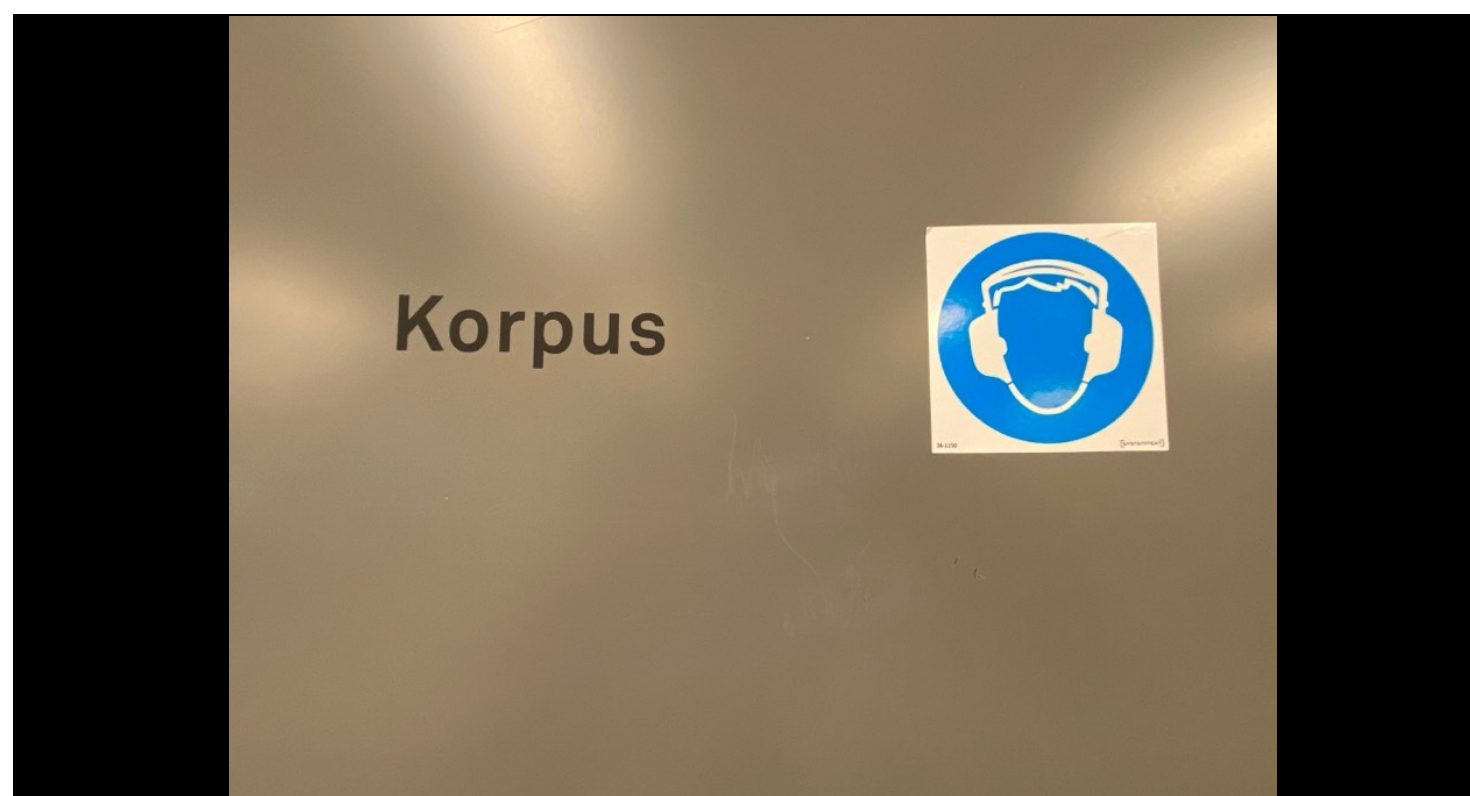


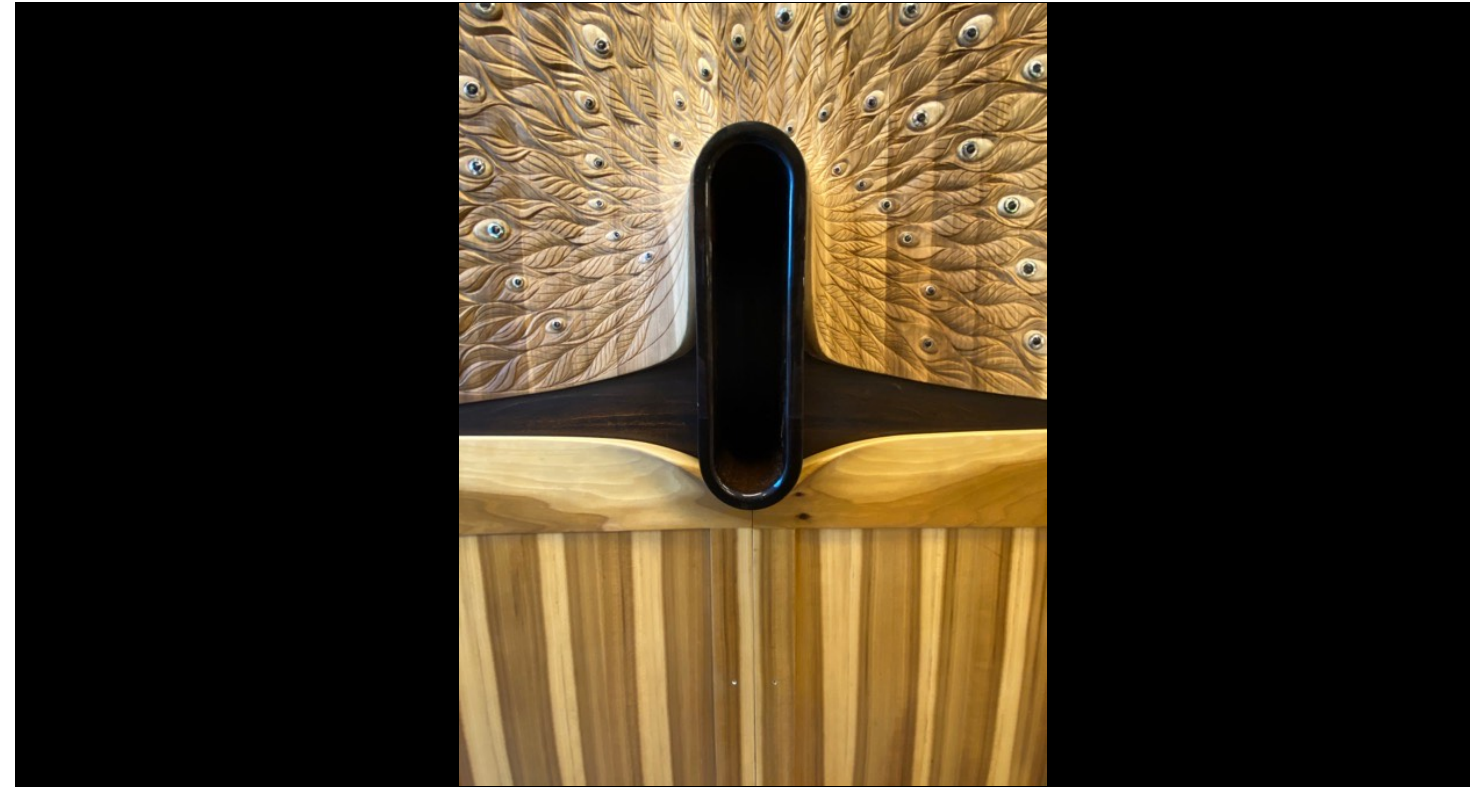
Sarah Davies book *Hackerspaces* (2017) has a wide domain of application —if making in the sense of maker-spaces is expanded to knitting groups and sour-dough baking—and a narrow domain of application, when making is restricted to hacking, when linked up with/implicating digital technologies.

Between them lies the question of how muting/voicing gender, group and age affects the recruitment pattern and articulating the politics of different maker spaces. The question is how this affects the design—plan and purpose—that programmed the qualities of the maker-space at the outset.

A way of seeing the value of the variety—in gender, ethnicity and age—is that it works as a randomising agent, rather than a vehicle of group politics. I.e. if the virtue of chance methods is that they will tease out the cohesive qualities of practice, as the foundation of the maker-space experience.

5





In the phenomenology of *embodiment*—the interaction and exchange leading up to apprehending object as a *body*—there are some basic mechanisms suggested by Johani Pallasmaa in his little book devoted to the [eyes of the skin](#). It features the mechanisms of the *haptic* sense.

The first step is to conceive that all the *other* senses—vision, hearing, smell and taste—are *derived* (and specialised) from the haptic sense. Then the haptic sense thereupon comes in as a connector *between* the other senses. As a consequence they are available to a variety of changing contracts.

The variety of such contracts become part of our *sensory history*, that co-evolves with knowledge (including its *rational* aspects). The conscious work to develop *intuition* across this *gap*—as a foundation and a connection—is the purpose of the *gap-game*, and the prerogative of the *learning theatre*.

