Supporting Cultures of Making:
Technology, Policy, Visions, and Myths

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ABSTRACT

Recent HCI research has linked social policy to design, e.g., in issues such as public safety, privacy, and social justice. One area where policy, technology, and design intersect is in the vision of the creative economy. In that vision, creativity, distinct local/regional cultural practices, technology, and entrepreneurship synergistically produce social innovation on a scale sufficient to drive economies. Culture and creative industries (CCI) policy specifies how governments intervene to support such clusters. Maker cultures are seen as central to this vision, but comparatively little is known about how makers produce culture. We offer a critical analysis of several encounters between CCI policy in Taiwan and its maker scene. These encounters reveal misalignments that undercut efforts intended to support making. We propose that supporting any creative culture, including making, entails a serious commitment to understanding its culture, including its cultural contents and their means of production. We further argue that scholarly rigor in cultivating cultural *appreciation* is just as fundamental as scholarly rigor in empirically representing cultural practices when it comes to pursuing such a cultural understanding.

Author Keywords

Maker cultures; hackerspaces; making; Culture and Creative Industries; policy; creativity support; critical computing; East Asia; Taiwan; social innovation

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

It is nearly a decade since since the concept and practice of making and hacking became a global movement, having been a niche hobbyist practice in the 1990s-2000s [15]. This movement has been the subject of intense coverage in the popular media, industry, public institutions, and of

course HCI research. Computer scientists working in hardware have embraced making by developing and deploying new tools to support it [10,40]. Social scientists focusing on HCI topics such as education [49, 52, 56], creativity support [28], citizen science [47], and more have also jumped in. Other takes link making to political activism [37], feminism [16,17,61,62,43], inclusiveness [64], sustainability [24,52], and ICTs for development [23,25]. Critical scholars in HCI have linked it to the material turn [36], craft [7], fine arts [13], design methods [14], futuring [31], and critical making [19,51]. Scholars of industry and innovation have also focused on how making contributes to industrial fabrication [18] and innovation cultures [32,33,34,35].

This, too, is an HCI paper about making. But it does not say much about makers actually making: you will not read here how a Raspberry Pi was ingeniously used to solve a problem, or how a sculptor's introduction to a CNC router made her see wood in a new way. The paper is about maker *culture*, which seems to suggest something different than making understood as a community of practice. HCI already talks about "maker cultures" (*n.*) [2,5] and "to hack cultures rather than devices" (*v.*) [17]. The term suggests a distinction between the empirically observable practices of a maker space and the subtler aspects of culture, for example, making's relations to the arts, spiritual life, national/regional subjectivities, collective memories and aspirations, shared imaginaries, and stylized ways of being. Yet how can these subtler aspects of culture be perceived, if not through observation of cultural practices? One of our goals is *to essay*, in the formal of sense of the verb, meaning "to try out, to speculate about," what that distinction means, what's at stake when we talk this way.

We were prompted to think more seriously about making as culture because it is at the center of a controversy we learned about in our long-term ethnographic work on creativity in Taiwan. There, relations between making and culture are much discussed. For example, government Culture and Creative Industries (CCI) policy sees making as a key element in a national-scale culture of social innovation that it is trying to cultivate. For their part, Taiwan's makers debate how their making does, could, or should enrich and perpetuate their cultural subjectivities—as Taiwanese and/or Chinese creative citizens. These two notions of maker culture (i.e., cultures of social innovation vs. Chinese/Taiwanese cultural subjectivities) seem to be at odds, and in fact this tension is central to debates in Taiwan. We

will explore this encounter as one among many, in hopes at arriving at an understanding of ways that makers inhabit cultures, are cultures, and make cultures.

In doing this work, we build on prior work in HCI, CSCW, and STS that explores the intertwined fates of information technology design and social policy [6,26,27,29,66]. Our focal point in this entanglement is the issue of "culture," because Taipei's makers seemed to be adversely impacted by a CCI policy ostensibly trying to help them, a policy whose focus is "cultural creativity," a policy that we now believe was constructed and implemented without a serious understanding of "culture." The stakes for HCI are high because HCI is deeply implicated in the interpenetration of technology and culture—HCI's agendas to democratize creativity and innovation through content authoring tools being but one example. Our research suggests that this agenda increasingly depends on, among other things, an understanding of how computational practices reflect and produce "culture." Yet culture is more than (and yet includes) observable practices. Culture is notoriously difficult to pin down, to define, to represent; yet it does allow for appreciation, and its scholarly cultivation.

Contribution

A common criticism against CCI policy around the world is that it fails to grasp that cultural creativity is somehow different from other industrializable forms of labor. What is so different about cultural creativity? How does making figure into cultural creativity? This paper traces our efforts to take these questions seriously, to understand "maker culture" in a theoretically and methodologically robust way.

Our contribution in a narrow sense is to offer an account of Taipei's maker scene, with a focus on how it *does* cultural creativity. In a broader sense, the contribution is also a reflection on how HCI researchers might observe and analyze (or interpret?) a given computing culture, where the hope in a sense is not just to *represent* that culture with scholarly rigor, but also to *appreciate* it with scholarly rigor, to open oneself up to become more fully alive to it. This distinction between truthful representation and subjective appreciation as two modes of understanding a creative culture is key to this paper. It was first brought to our attention by an official in Taiwan's Ministry of Culture. The two modes are not exclusive, of course, and presumably complement one another. But this official argued that representation without appreciation reproduces cultural narratives that marginalize the arts—defeating the purpose of culture and creative industries initiatives.

To develop this appreciation, we deploy a cultural theory of *encounters*. Let us unpack that. Culture is not a static thing that people are immersed in; it is the patterned and stylized repetition of activities, ways of life, beliefs, and customs that reproduce it [55]. Cultural creativity is generative of these patterns and styles themselves—it is not limited to creating products that passively reflect those styles. Understanding making as cultural creativity, it seems, means ap-

preciating how making introduces new cultural ways of being and doing. To make that visible, guided by theory in human geography [64], feminist border studies [1,42,54], area studies [45], and literary theory [48], we focus on cultural creativity encounters. Encounters—as we explain later—refer to meetings where oppositions and distinctions are active, enacted, imagined, asserted, and transgressed. In these meetings new cultural possibilities are discovered, tried out, or shut down. In short, encounters represent a place/event where cultural labor—the creative work of producing culture—becomes manifest.

In the main body of the paper, we account for the Taipei maker scene's cultural creativity through an analysis of three encounters: a *convivial* encounter that attracts people to participate in making and facilitates community building; a *mythological* encounter that helps construct a distinct ideological vision of making; and a *satirical* encounter that draws a hard line around this culture and sorts people, practices, and ideas inside or outside of it. We close by returning to the issue of how to perceive and to appreciate cultural achievements that stubbornly speak in their own language; we suggest ways and motivations to appreciate that language in order to support cultural creativity, including making in HCI.

RESEARCH LOCATION AND METHODOLOGY

We have been doing ethnographic work on creative industries in Taiwan since 2011. Taiwan is an interesting site for cultural creativity research in HCI for several reasons. Its CCI policy has been developed and implemented for 20 years, and thus offers a track record that is ripe for empirical study. Taiwan's economy has been driven by precision manufacturing and engineering, so IT is usually foregrounded in policies, practices, and imaginaries. Taiwan also has strong folk traditions of fine arts craft, and institutionally (e.g., in universities) it has been investing in design and applied arts. In short, Taiwan is building a record of supporting diverse forms of creativity, and doing so in a way that technology is, somehow or other, implicated.

Driving all of this is the global ideal of the creative economy: creative professions invent new products, methods, or technical applications; these result in startups or new product teams in existing companies; these demand skilled creative workers, who are paid well; all of which drives the economy. In Taiwan, making is the latest protagonist in this narrative, and it's easy to see why. Taipei boasts a vibrant maker scene, and is home to one of the strongest engineering populations per capita in the world; moreover, making is publicly supported by politicians, receives government funds, and well appointed maker spaces are appearing in the city's universities. And yet our sources in different levels of government, in NGOs, and maker spaces alike agree: something is still not right with Taiwan's creative industry.

Sites. Research sites were chosen to reflect different ways that maker practices interface with cultural and creativity industry policy. We focused on Openlab Taipei, which is

the oldest maker space (founded in 2008), and which serves as a point of convergence for artists as well as makers and technologists. Members of OpenLab Taipei regularly interface with governments and publics at township, regional, and national levels: They participate in policy debates online on social media and in person at public protests and demonstrations against government policies; at the same time, they also collaborate with the governments, serving as judges in government-sponsored maker competitions and events. We also visited FabLab Taipei, FabCafe Taipei, MakerBar, FutureWard, MakerPro, TW BioArt, the Taipei City government, the Ministry of Culture, Shih Chien University School of Design, the National Taiwan Craft Research and Development Institute, and the Epoch Foundation and Garage+ entrepreneurship and innovation centers.

Data Collection. The present work draws from and is informed by our fieldwork on making in Taiwan, in which two of the authors conducted about 100 hours of interviews, another 100 hours of participant observations, and a series of workshops. One of these authors is a native of Taiwan and native speaker of Chinese; the other, born in the US, has conversational competence in Mandarin. Participants include hobbyist makers, makerspaces, hardware entrepreneurs, policy makers, artists, designers, crafters, manufacturers, and more. Since makers engage in making activities and practices both off line in person and online virtually (e.g., announcing events, exchanging how-to tips, and critiquing each other's work in forums and social media such as Facebook and Google + and collaborative platforms such as Hackpad among others), it was necessary to engage with subjects in their own terms, so we also employed a set of digital ethnographic approaches [8,9,20,22,39,41] to examine how making-related activities and interaction unfolds virtually and how makers interface with others outside of the maker groups, including other makers and the public at-large. We developed a customized scraper tool to automate the collection of posts and comment threads from Facebook, with individual items numbering in the tens of thousands.

Interpretive Procedures. All three authors conducted our analysis through a procedure known as *explication de texte*, or close reading, an analytical method originating in the humanities [45]. Two of the three researchers involved in the textual, image, and artifact analysis have doctoral training in the humanities and are experienced with this analytical practice [3]; the third is a graduate student, fluent in Mandarin and English also trained in this method. We did not use grounded theory to inductively derive conceptual categories from it. Instead, we sought to cultivate a cultural response to those encounters, one that primed us for appreciation. We examined how articulations of encounters were shaped, structured, inflected. We examined subjects' use of diction, metaphor, narrative structures, allusive resonances, hyperbole, double entendres, myths, in light of similar devices found in other creative texts, including folk tales, myths, and literature. That is, we sought to open ourselves

to maker culture in a way that activates the full stock of literary, cinematic, and dramatic experiences available to us. This phase followed an iterative and dialogic process, alternating between reading alone and reading together, and between reading theory and analyzing textual data—mutually informing one another until a picture emerged that seemed to fit with participant discourses and activities, our own experiences, theoretical resources—and above all, a sense of hard-won cultural appreciation.

CULTURE AND CREATIVE INDUSTRIES

Concepts of culture and creative industries and the creative economy became popular around the globe in the early 2000s. They are seen to benefit individual workers and the nation itself, as expressed in a 2013 report by UNESCO and the United Nations Development Programme (UNDP):

> The term "creative economy" [privileges] activities involving cultural creativity and/or innovation […] in order to uncover the increasingly symbiotic relationships between culture, economy and place. […] cultural and creative industries not only drive growth through the creation of value, but have also become key elements of the innovation system of the entire economy. […] they stimulate the emergence of new ideas or technologies, and the processes of transformative change. […] In this view, the cultural and creative industries are trailblazers, nurturing overarching societal dispositions which stimulate creativity and innovation, working to the benefit of all. [63]

Culture and place in this framing are tied together not because they are containers in which creativity unfolds, but rather because they *qualify* creativity, that is, put a distinctive character or mark on it. Economically speaking, this distinctive character is a kind of monopoly (e.g., the way a particular wine or cheese is tied to a particular valley that makes it). A region becomes home, then, to a certain kind of cultural-creative practice, which sets off a chain reaction that attracts creative producers and consumers alike, transforming tastes, generating still more supply and demand in a benevolent circle until it eventually effects transformational societal change: the creative economy.

In summary, culture and creative industries policymakers and creativity support researchers face the triple charge of

a. Identifying distinctive cultural and/or *creative practices*, and giving them visibility (e.g., in new markets, in research, etc.)
b. Establishing and/or supporting existing clusters of creative professionals to grow them into *social innovation hubs*
c. Making the physical *places* in which the hubs are situated desirable, so as to attract creative professionals and tourists alike

CCI in the Taiwan Context

As is documented elsewhere (e.g., [12]), Taiwan's economic development since 1949 is considered a "miracle," in which the island developed into a global economic power-

house over a period of a few decades. Alongside of Singapore, Hong Kong, and South Korea, Taiwan is known as one of the "four Asian tigers." A highlight is its IT engineering capabilities, driving Taiwanese companies such as Foxconn, Acer, Asus, and HTC. However, since 2000, the story has been more mixed, as Taiwan has failed to stay on top of global manufacturing and IT trends. The decline of desktop computing, for example, has hurt companies like Asus and Acer, while consumer electronics company HTC has been outmatched by Apple and Samsung. Taiwan has been trying to pivot to a knowledge economy, and its CCI policy, which has evolved in different forms since "Culture Industrialization – Industries Culturalization" was launched in 1995, is seen as key to that pivot. Under the name "Creative Taiwan" the government in 2009 launched a nearly US$200 million initiative to support creative industries, with US$80 million budgeted between 2013 and 2016.

As is typical of such laws, Creative Taiwan offers provisions to promote cultural appreciation in schools, subsidies for artistic exhibitions and performance spaces, business consulting for creative enterprises, legal help with IP protection, access to historically significant cultural treasures, and so forth [58]. But its largest financial investment—nearly 50% of the total budget allocation [12]—is into the creation of "cultural and creative parks," or CCP. Modeled on science and technology industrial clusters, these villages are intended as cultural and creative "clusters" to drive social innovation. Physically, they are fashioned as parks to attract creative professionals to work in them and tourists to come and spend money in them. But government-sponsored CCPs don't always become hubs of creative activity. Some are home to what makers and others facetiously call "mosquito houses" (蚊子館) which are designated spaces in CCPs that sit unoccupied, except by mosquitos. They fail to attract people or creative practices. The image of the mosquito house is a motif throughout this paper.

Cultural Policy without Cultural Content
Taiwan's CCI policy has been critiqued in policy research (e.g., [12,30]). Chung summarizes,

> what constitutes the CCI in Taiwan is an overarching industrial contract that covers the government's ambitious political promises, while defining actions across all levels and connecting all sectors, including the traditional, manufacturing, high-tech, art, and cultural industries, but *without enumerating and examining the culture content of Taiwan*. (emphasis added)

On the one hand is the promise that social innovation is an economic panacea, and on the other is the claim that culture is the magic ingredient—except that the culture in question is black boxed! Enumerating and examining cultural content is a form of cultural appreciation. Yet, an official in the Ministry of Culture explained to us,

we [Taiwanese policymakers] have an inability to appreciate quality -- and that is actually what I feel the most lack-

ing in this country. We tend to specify, quantify success. [...] Very few people [in government] are developing the eye to see something beautiful. [...] Even Foxconn or Acer, all these people, they never actually think about technology and culture as one. They are still thinking about them as two separate things. [They think:] Culture are the ones who need subsidies from technology, so cultures are still very much a weak and vulnerable baby. [...] And I think that's quite sad.

The lack of cultural appreciation results in the *segregation* of culture from other forms of value, which subverts the foundational concept of the creative economy. This is strong criticism, but other sources support it. Policy scholar Chung [12] points out that Taiwan's CCI policy papers identify cultural industries using narrowly economic concepts: "Whether it creates more employment or involves more participants; whether it has larger production value, with the associated effects that this brings about; whether it has the potential for significant growth; whether it requires higher originality or creativeness; and whether it can create higher added value." In our analysis of government documents, we had no trouble findings examples, such as this one from a 2004 white paper on CCI "If a maker of handicrafts wishes to transform their business from a small-scale workshop into a fully-fledged company, first of all they need to start thinking about costs and profits" [59, p25].

The Ministry of Culture official we interviewed attributes these failures of appreciation in part on foreign ideas:

we only copy what people do. We think, oh, 3D printing's good. There we go. And then, culture-creating industry's good. There we go. And we actually never actually slow down and understand what on earth we're doing this for [...] They said, "3D printing is a global blah, blah, blah. MIT so-and-so said blah, blah, blah. Harvard Business Review said blah, blah, blah." So let's do 3D printing!

Lacking a sensibility for Taiwan's own culture and needs, the Ministry has turned outward, buying into global narratives. The "Maker Movement" is one such narrative, and the 3D printer is its most recognizable trope. Making is practiced in indisputably globalized ways; for example, every certified FabLab must check off a standardized list of equipment and tools, the hope being that anything created in one FabLab can be created in any other. Yet cultural practices don't stop at the FabLab door, so any given maker scene will involve assemblages and encounters between different ways of being and doing, enacted in concrete spaces by embodied actors [31,45]. To perceive those assemblages, to witness those encounters—might be to begin the process of appreciating "the cultural content of Taiwan"—at least in the context of making.

THE CULTURAL CONTENT OF TAIPEI MAKING
Our account of the Taipei maker scene *as* culture focuses on different types of *encounters* within the physical and verbal performances of the actors themselves. Our under-

standing of the concept is shaped by human geographer Helen Wilson [64], who argues that encounters are meetings, but meetings of a certain kind:

> Encounters are historically coded as a meeting of opposites. [… Different types of encounter] are connected by an interest in grammars of difference, 'border imaginaries,' and antagonism. […] I argue that encounters are fundamentally about difference and are thus central to understanding the embodied nature of social distinctions and the contingencies of identity and belonging. [64, p2]

Theorists observe that encounters are often spatialized, using language such as frontier, border, boundary, traffic, margin, and borderland. Such terms are used in discourses on immigration, tourism, postcolonialism, crime, national security, etc. Thus, encounters are moments where differences are focalized, where membership is forged, and where diverse engagements unfold—in short, they are locations and events where a lot of cultural work is done.

From Mosquito House to Makerspace

We begin back in the "mosquito house," where space is simply an empty container in which something exciting is supposed to be happening but where nothing actually is. The opposite of a mosquito house is arguably OpenLab Taipei, a makerspace/community that is brimming with activity—and stuff. OpenLab Taipei, known as OT, occupies a tiny space—we estimate that it is about 40m^2 in size. Its aim is to promote FLOSS (free/libre/open-source software) to practice, experiment, and create engaging interaction and digital artworks. OT was founded in 2008 by an artist named Cheng Hongki (鄭鴻旗, pronounced "Jung Hongchee"), and it moved to Treasure Hill in 2009 once it was reopened as a culture and creative park. Hongki—who in English is usually referred to by his first name—is often referred to as the "godfather" of making in Taiwan. His status is linked to his charismatic and also stubborn commitment to a vision of making, one that is rooted in the ideals of open source, sustainability, and Taiwanese cultural identity. More than any figure in Taiwan—according to people throughout the scene—Hongki founded the discourse on Taipei's maker culture. If one wants to understand the cultural content of the Taipei maker scene, then Hongki's OT—a physical makerspace, the embodiment of Hongki's vision-practice, and the symbolic hub of a network of social media conversations reaching across maker groups in Taipei—is a great place to look.

In 2014 Hongki applied to expand OT's space to make room for large making tools and machines and even, he hoped, for private spaces for members. That application and the next two were all rejected. Indeed, OT *lost* part of its space in 2015, and in the summer of 2016 Hongki publicly disclosed that he was considering closing OT's doors once and for all. Revered as a hero by many in the maker community, and rejected repeatedly by CCI agencies, Hongki and OT are central to the diverse encounters that define—and produce—the Taipei maker scene. These encounters

collectively come to symbolize—in a complex and layered way—the distinctive challenges of "industrializing culture" and "culturalizing industry."

We next describe OT as a physical space and then introduce and analyze three different types of culture (re-)producing encounter: *convivial*, *mythic*, and *satirical*. We characterize OT's internal encounters as convivial—that is, focusing on the ways that Taiwanese food culture attracts participation, promotes inclusivity, and undercuts hierarchical power relations. Next, we consider participant narratives that mythologize OT and Hongki—often in ways that (a) efface boundaries between the space and its leader, and also (b) assert boundaries between OT-Hongki and the rest of the world. We conclude with an analysis of maker movement satire, in which a border is asserted and then people, values, and discourses are sorted on either side of it.

Description: OpenLab Taipei as a Space

Treasure Hill Artist Village is nestled between a water plant and a river on a steep foothill, facing away from the city. A former squatter village, it was built using found materials from the plant and the city. Its houses are small and densely packed in narrow, winding streets. Public walkways traverse across rooves and balconies. Access is limited because of the foothill, and its entrance is dominated by an old temple. "*This place is a treasure on Treasure Hill*," writes a maker documenting the history of OT, continuing, "*away from the hustle and bustle of downtown, along a path by the viaduct, through dark green trees, in a quaint settlement.*" Elsewhere in the Hackpad page, others describe it as "*picturesque*" in spite of their "*getting lost*" in the village's "*maze*" of "*roundabouts and alleys.*" OT itself is located at the top of "*a steep and narrow staircase*" leading to its door, which one notes is adorned by a *chunlian*—a traditional Chinese decorative red scroll—beside a sign proclaiming that Chinese BBQ tastes good.

Once through the door, most visitors (ourselves included) are surprised by how small it is. It features a table in its center, and clutter is found everywhere else: along the walls, on and under the table, and hanging from the ceiling. OT visitors describe the space consistently: "*In the midst of chaos, there are different materials, parts, and equipment littered within the space, flow management units, work tables [...] at the back there was a pile of junk*" writes one. Another says, "*The corners of the space were filled with waste materials that Hongki found [...] water prevention techniques were not done well, and when it rains the whole place leaks, based on what I saw from the debris scattered all over the room.*" Another points out, "*there was no maker equipment in sight. How can you explain that?*"

Convivial Encounters: Wednesday Arduino Nights

One of our visits to OT happened on Wednesday Arduino Night. Although we had been to OT before, this was our first time attending a public event. As outsiders, we both recall feeling nervous about the evening—how would they respond to a couple of foreign academics observing them?

We showed up a few hours early to observe preparations. During the observation, we began chatting with a regular member of the space. About a half hour into the conversation, he reached into his backpack and pulled out a plastic bag with sliced fresh vegetables. He pushed some of the stuff on the table aside to create a little space. Moments later the tabletop was crowded again: now, alongside the broken electronics were vegetables, a bag of noodles, small plastic bottles of sauces, a portable burner, and several metal bowls (Fig. 1). The dialogue continued while our informant mixed ingredients and boiled water.

Fig. 1: Handmade noodles on Arduino Night

An hour later, we were eating sesame noodles together, still talking about making, even while, one-by-one, Arduino night participants were showing up. "*Have you eaten yet?*" "*Is this your first time here? Have some noodles!*" were typical greetings as (mostly) young men wandered in and OT became crowded. They handed each other food and it was no longer clear who had made it. They squeezed in next to us at the table and asked what we're working on this week. One brought in a malfunctioning OEM Battery Balance Charger, and we were drawn into a circle while it was diagnosed and then collaboratively repaired. As we finished our noodles, one by one we washed our own dishes in the sink. The sun was already down, and we were makers.

OT started Wednesday Arduino Night in August 2013 and started serving food in March 2015, and since then food has been a consistent fixture. The food differs from one Wednesday to the next, but in all cases it is typical Taiwanese cuisine—the kind of food people cook at home or can find in food stands at night markets, local dishes whose names in many cases we don't even know how to say in English. Most weeks, a few days before Wednesday, someone posts in the Facebook group, "*what are we doing for dinner this week?*" One week, someone has a hankering for *lu-wei* (braised food in five spices). "*I am starting a new thread to discuss what to make (cook) on tonight's Arduino night. I will be there around 3 pm. I can help make rice, and after that, I want to focus on making* lu-wei. *Anybody want to help?*" Several did. Another week: "*In today's OT Wed Arduino Night, I will make OT* danzi *noodles. The stock will be made from duck bones. There will be shrimp, Chinese cabbage, minced pork sauce, and* lu-dan *[seasoned hardboiled eggs].*" Because it is around the time of the Mid-Autumn festival, he asks for a headcount. On special occasions, Facebook planning starts earlier and the dining involves many different dishes; but it always is one form or another of typical Taiwanese cuisine.

Taiwan has a folk dining tradition known as *bando* (辦桌), in which special occasions such as birthdays are celebrated with meals served in tents thrown up in public spaces for the purpose. The *Taipei Times* [56] characterizes *bando* as "clamorous eating around a round table in an outdoor space" and different regions are known for different forms of *bando*. Wednesday Night Arduino is not, strictly speaking, traditional *bando*, but *bando*—what food is served, how to behave, what it means—is part of the distinctive cultural backdrop that Arduino Night participants all share. Taiwanese *bando* culture uses food to create a festive social atmosphere on the cheap. Such atmospheres can downplay political hierarchies. Hongki and other senior community members were present, but as we jostled our bodies to find places at the table, to stand in line by the sink, to reach over to grasp our bowls in the first place—we physically and socially encountered most of the people in the space, veterans of the maker scene and first-time local students alike.

This encounter was between us as outsiders and the community—a convivial encounter in which we came to feel at home in OT in a typically Taiwanese way. Perhaps, then, one of the things missing from the well appointed mosquito house in the CCP is a rowdy serving of sesame noodles, though admittedly the pathway from noodles to successful startup is both twisty and slippery.

Mythic Encounters: The Maker Spirit Comes of Age
The convivial encounter just described focused on how a typical Taiwanese cultural practice facilitated our sense of welcome in the space during an event. Social comfort and cohesion presumably contributes to maker culture, but it is not a sufficient to create one: something else is needed. After his trip to the 2015 Maker Faire in Shenzhen, China, Hongki reflected on Facebook (dated July 4, 2015) that making in China and Taiwan show a "*lack of real content*"—repeating criticisms of CCI more generally. He then proposed four action items, two of which were "*promoting the spirit and habit of making/fabrication*" and "*connecting the past and the present in a site-specific way.*" Around the same time, sensing a threat to OT as a result of his failed bids for government support, Hongki solicited stories from participants sharing the meaning of OT. The response was strong: 26 individuals (23 male and 3 female) wrote 1-10 paragraphs each about OT on Hackpad. In writing these narratives, participants provide visibility into both of Hongki's action items just mentioned: promoting the "spirit" of making and doing so in a "site-specific way" that connects past and present.

In this section, we analyze those 26 OT stories. The *encounter* in these stories is largely rhetorical: it is the moment the speaker enters the "world" of OT—a universe depicted as separate from the mundane one. The result is the fabrication of a coherent *myth*, a myth that does the cultural work of constructing the Taiwanese conception of the "maker spirit"—and yet, OT's situation on Treasure Hill also grounds this maker spirit in a particular location in

Taipei. We characterize them as "myths" both because they share certain structural features with myths and because they fashion a hero out of Hongki and a paradise out of OT.

The Rift Between the Worlds

In contrast to our description of OT as a space on Treasure Hill, the characterizations of the space offered in these 26 narratives tend to be much more subjective and even dreamlike. Consider this excerpt:

The first time I came to OT, I had already caught wind of OT's existence. It is rumored to be a really strange place, but I did not realize just how strange it would be. [...] I decided to go to OT for a look. I looked up Treasure Hill on the map and as I reached the front entrance, I felt like I was being played. Why would it be in a temple? My gut feeling told me to just keep moving forward and it should be right. Then I discovered the artist village itself, and it was definitely odd. After that there was narrow set of stairs that had a sign which said OT, also a sign that said "Chinese BBQ tastes good." [...] I walked the steep and narrow staircase towards the door, after opening the door I found a person, I greeted him and walked in. I asked him whether we should lock the door. He replied that two men in a locked room together might feel a little weird. Actually, I found him weird, but I continued to look around the place, and saw a vintage typewriter and also an old Mac computer. Heavens! This is so weird! I asked whether I could take apart the the keyboard. While taking apart the keyboard, we were chatting: "What should I call you?" "My name is Hongki" "Oh, you are the legendary Hongki." Finally I realized that the stranger I was talking to, while taking apart the keyboard, was Hongki himself.

The word "strange" and its synonyms appear over half a dozen times, and it is used in similar ways to describe three very different things: OT as a place, the person Hongki, and the speaker's own feelings. This language of estrangement is key to what we describe here as a threshold narrative. A *threshold narrative* is a story about an encounter, a moment of border crossing, often near the beginning of a text. As literary theorists point out, such narratives are commonly used to inaugurate a series of themes that the text will return to and develop [21,50]. In other words, details in a threshold narrative signify beyond themselves; they anticipate meanings that only come into their own later. This estranging language is how this speaker communicates that he has entered into a different world, one that has transformed him (the speaker). In the words of a different speaker, "*Today at OpenLab Taipei I saw a different universe.*" Another writes, "*being here is destiny, luck, shock, and mysterious fortune.*" No wonder yet another describes OT as "*Taiwan's most romanticized makerspace.*"

There are a half dozen threshold narratives in the OT stories documented by the makers themselves on OT's Hackpad. Three of them begin with close variations of "*the first time I went to OT, I....*" In each case, the surprise, oddity, and other first impressions are claimed to symbolize a deeper

truth about OT. "*My OT experience can be divided into the door and outside the door*" begins another—the centrality of the threshold could hardly be made more explicit. One speaker opens his narrative in this way: "*Finding myself with free time, I decided to embark on a pilgrimage,*" characterizing his trip as a kind of religious journey—a well established narrative genre. Another expresses herself using similar connotations, "*Honestly my feelings about OT are like religious beliefs. OT is comfy and like a lighthouse for makers that are lost.*" Another expands on this notion of "*comfy,*" saying that it makes him feel "*unviolated,*" "*calm,*" and filled with "*an inexplicable feeling of the maker spirit.*" Another speaker uses similar metaphors of purity: OT "*is pure with no additives.*"

These encounters with "purity" lead several to what they characterize as a heightened state of understanding.

I started to understand more deeply about the Treasure Hill Artist Village story. These buildings were made by the original residents to solve their own housing problem. They exemplify a "it's your house, you should build it yourself" spirit. [...] Perhaps these buildings are not perfect in the eyes of experts, but from the beginning [...] more than 200 families made houses. They are what today we would call Maker.

Here, the physical setting of OT—Treasure Hill, with its history of self-made homes out of local materials—becomes a symbol of the maker spirit. No wonder OT would be situated in such a space. Another writes, "*I finally understood. This is a place where you don't have to fight for equipment, because when people come to OpenLab, it is for intellectual discourse. To share humanity. To share in the maker vision. [...] This group has spirit. This place is the incubator of the maker spirit.*"

The Sage at the Top of the Hill

A variation of the threshold narrative—and often included in them—are "the first time I met Hongki" narratives. Such stories occurred five times in the OT stories.

Hongki brought a cup of coffee into the room and did not even greet me. I very quickly spoke of my intention, ready to work, and I did not expect his reply: "Eh, do you normally speak like this? Is your burden so great? Can you loosen up a bit?" [...] I did not realize that I was exuding emotional tension.

The narrative structure is one of inversion. At first, Hongki seems odd, even rude. But at the end, Hongki is revealed to be the more appropriate person, and the narrator is revealed as the odd one. Again, this is a symbol of the personal transition that OT members characterize again and again.

I curiously asked, "Hongki, do you have 3D printing equipment here?" Later he complained to me that my sole purpose in coming to Taipei was just to try one small piece of equipment. [...] Hongki pointed at the equipment and gently said, "In here, whatever that you want to use, please

use it." Is it that easy? I asked. And Hongki replied with humor, "the advantage of other makerspaces is that the facilities are comprehensive, but the advantage here is that we have no facilities!" I turned my eyes and looked and there was a 3D printing machine. That was the most glamorous machine they had.

This double-narrative describes the speaker's first visit to OT—again, a threshold narrative—in which an inversion occurs when the speaker expects OT to have a full stock of maker equipment, and not only does it not have that, but Hongki turns it into a positive, normalizing making without making machines. The second narrative is one of retrospect, where later, Hongki and the speaker look back on this threshold event and Hongki again illuminates for the speaker how it is all to be interpreted. In each of these cases, the initial encounter with Hongki involves a personal transformation, in which the speaker's whole world has to shift to accommodate Hongki's aura.

Hongki is aware of his exalted status in the community and discourages it. In a July 2015 post, for example, he writes,

I believe that the importance of "founder" is overrated. A founder at best is somebody who starts something. Even if that person doesn't do it, somebody else will step up. The success of a community relies on those who participate together. [...] the reason I started OT was in part trying to solve problems I encountered when I created, made, and learned [...] I was pushed into a leadership position because the global maker movement. I am not a "pro" but am just as lame as everybody else.

Pure Junk

It is not our position that OT is paradise on the mountain, or that Hongki, for all of his accomplishments, is a messiah of making. We did want to show that makers used over-the-top language to talk about OT, and without losing our critical distance, we wanted to appreciate why. Literary reading techniques helped us notice discursive patterns—the threshold emblem, the sage on the hill, rhetorical inversions, the epiphany, the pilgrimage, separation of the pure and impure, etc. These are cultural-creative formulae that are used generatively to produce new cultural content, in this case, a vision of "pure making," or "the maker spirit."

The mythologizing narratives of OT help makers identify with something more culturally tangible than standard maker tools. OT becomes "pure" in part because it lacks those tools. But neither is it empty: it is filled with "junk," which has, like so much else at OT, has multiple meanings. Writes one, "*we always laugh at Hongki's collecting of junk,*" but then the speaker immediately adds that he now has a more "*realistic*" understanding of "*how to take second-hand parts and equipment and upcycle them.*" The junk is both literally junk and also a cognitive scaffold that enables participants to see makerly possibilities hitherto invisible. "*Hongki's collection of special antiques,*" as one narrator tactfully puts it, "*can produce new ideas, which is why I*

participate in the activities." OT makers are learning how to see the way that Hongki sees, much as a literary critic or design instructor teaches a student how to see in a more skilled or interesting way.

This mythologizing—however over-the-top and uncritical it may come across—does cultural work. It proposes, and then proceeds to work out in detail, an alternative to the mosquito house. It is a common critique among makers everywhere that four walls and a 3D printer don't make a makerspace. OT myths attempt to propose a local vision of what *does* constitute real making. The main contents of that vision include a rejection of traditional Taiwanese rote education, an elevated ability to see creative potential in junk, a related social obligation (both within the space and in society at-large) to produce value from junk, and a prioritization of making with Taiwanese physical and cultural resources, including Taiwan-made technologies and Taiwanese folk traditions such as hand puppet opera.

These contents in themselves aren't particularly noteworthy, but the language of estrangement and thresholds does the work of *marking* making as different from everyday life. As fictions demand of readers a "willing suspension of disbelief," so making—at least, as articulated in these accounts—demands a willing suspension of mundane life. The specific aspects of mundane life that have to be suspended can be glossed as the maker's response to our research question: What is so different about cultural creativity? It inhabits an alt.world, where junk is creative material; dying folk traditions undergo rebirth, and maker tools are unnecessary and even impure. In this world, making entails an almost mystical communion with a "maker spirit." But this maker spirit is as much a personification of the Treasure Hill story as it is of the global maker. On Treasure Hill, squatters (i.e., those operating outside of mundane society) built homes out of found materials (i.e., upcyclers), which came to constitute a uniquely charming architectural setting (i.e., creative and cultural value). Not only were they not helped by the government in producing this cultural gem, but it was government intervention that eventually destroyed their community. What must be suspended is a world that cannot even see cultural creativity. Once OT's story world is worked out, the borders—so convivial when we crossed the threshold on Wednesday Arduino night, and just beyond the edges of a dream in the OT stories—harden into a political weapon in our next encounter.

Satiric Encounters: Maker Cram School

At the 2016 Maker Faire Taipei, members of several of Taipei's leading makerspaces, including OT and FabLab Taipei, fabricated banners and presented them at their booth. The banners (Fig. 2) read, from top to bottom: "*Maker [Chuangke] Cram School! Let's Learn!*" "*The best faculty in the entire nation; they are animated, lively, and passionate when they teach. The School is the springboard of your life. It is the cradle of your entrepreneurial career.*"

"*Chuangke Cram School*." A young man carries a laser-cut sign that reads, "*We worship 3D printing*."

Fig. 2: A group picture by the OT booth in the 2016 Taipei Maker Faire

This image shocked Taiwan maker groups on Facebook when it was circulated, until its economy of wrongness made people realize it was satire. Understanding it requires unpacking a range of intellectual, cultural, and political issues, beginning with the word itself for "making." Chinese lacks a word for "making," so when the phenomenon swept the globe, makers in China proposed *chuangke* (創客): a play on words that changed the word for "hacker" (*haike*)，which in Chinese had negative, even criminal connotations) into a new word with positive connotations of creativity and innovation [35]. That word now dominates Mainland Chinese discourses on making, and it also resonates with Taiwan's start-up oriented understanding of culture and creative industry policy. Many Taiwanese makers advocate for a different word, *zizaozhe* (自造者), which translates idiomatically to "someone who makes it themselves" and is closer to the English term "DIY"—a term that captures the maker ethos without linking it to entrepreneurship. So the first move is to use *chuangke* rather than *zizaozhe* on the banners.

The next move extends the critique in a recognizably Asian way: to spoof the marketing vocabularies of Taiwanese cram schools. Taiwan—like Japan and South Korea—has a standardized test-driven education system. Both high school and university admissions are based heavily on test scores. The result, not surprisingly, is the emergence of "cram schools," which offer heavily-marketed, for-profit, after-school courses that teach to the test. Makers in Taiwan—like makers elsewhere—take a stance in favor of constructivist notions of learning and learning-by-doing; they believe that standardized tests crush creativity and encourage conformity. Cram schools neatly symbolize for them all that is wrong with education.

The third move has political bite: the banners are written in simplified Chinese. During Mao's Cultural Revolution, Communist China simplified the Chinese written language partly in an effort to boost literacy in its vast rural regions, but it did so at the cost of losing much of the semantic and phonetic meaning of the characters. Taiwan continues to use traditional Chinese script, and this use is one legacy of Taiwan's claims in the 1950s and 60s to be the authentic steward of Chinese culture; the script becomes one more hot-button signifier of the China-Taiwan conflict.

The banner display thus proposes a dichotomy, as follows: On the one side are entrepreneurial thinking, cram schools, *chuangke*, social conformity, and marketing's exploitation of fear—all associated with Mainland China through simplified characters (actual Taiwanese cram school marketing uses traditional characters). On the other side, by implication, making is liberated from entrepreneurship, learn-by-doing education is championed, creativity is embodied in countercultural protest—and all of it is tacitly associated with Taiwan—sort of. The wrinkle is that Taiwan's government and its entrepreneurship-oriented CCI policies would be in the first group. Thus the implied Taiwan in the second, favored group, is an aspirational Taiwan: The Taiwan that makers want. In this satire, the encounter has hardened; ideologies, language, social policies, people, and the whole China-Taiwan issue are sorted on either side of a big black line, and there's little room for doubt who the good guys and bad guys are.

CULTURAL IMAGES OF COMPUTING AS PRODUCT

We have summarized the theory behind culture and creative industries—the idea that the distinctive cultural practices of specific locations can be the genesis of whole creative economies eventually reaching beyond those practices, and we have seen that policymakers and technologists alike want to support such industries. We have seen a criticism of such agendas on account of their poor conceptions of cultural content. This in turn prompted us to think about—and eventually construct—our understanding of the cultural content of making in Taipei. This meant trying to see beyond observable makerspace practices to perceive traces of characteristically (if not always uniquely) Taiwanese ways of life, moral and aesthetic values, subjectivities, images, styles, and collective imaginaries and aspirations. We focalized our attention on *encounters*, richly theorized in area studies, human geography, and feminist border studies to activate a network of interrelated cultural concepts: difference, borders, subjectivity, transgression, traffic, antagonism. In particular, we showed how encounters facilitate the cultural labor of creating and maintaining of borders.

Borders need to do two things: they need to be asserted and maintained, so as to claim their territory; and they need to structurally allow traffic across the border. The cram school satire—and it is one of many discourses we found doing this work—performs the work of asserting borders. It does so by appropriating existing cultural borders and alliances—e.g., tensions between Western and (pan-) Chinese IT innovation, the Taiwanese public's conflicted attitudes towards China, debates about educational reform, and disagreements about the appropriate relationship between culture and industry—into its border-drawing.

But the maker scene is also constructing crossings. Taipei makers do not want to be defined by maker tools, practices, and discourses emerging from Boston or Shenzhen, but they nonetheless want access to the best of them—Hongki did, after all, go to Maker Faire in Shenzhen. The insular OT might seem diametrically opposed to an MIT-blessed FabLab, but OT makers are regularly found at FabLab Taipei (members of both are holding the banners in Fig. 2), and leaders of the two spaces regularly support each other on Facebook and beyond. Similarly, the reproduction of cultural food practices to foster conviviality establishes another border-crossing, a pathway for the Taiwanese public to cross the threshold and to become members of OT's community. The construction of such borders and the enabling of crossings is one form of cultural creativity.

We hope we have been successful in facilitating *appreciation* for the cultural creativity of OT and the scene it represents, but readers might wonder how such an appreciation informs supporters of the creative economy, including creativity support and maker research in HCI. One can argue that although Hongki and his followers seem mystified that their applications to the government keep getting rejected, it seems obvious enough that OT has virtually no constructive ideas about how to leverage making's potential for industrial innovation, and indeed, they even seem hostile to the notion. Should culture and creative industries agencies support such a group and the vision it represents? Should HCI research invest its resources in understanding what must seem like starry-eyed idealists with a penchant for sesame noodles? If the answer is yes, then we seem to compromise on our commitment to supporting plausible innovation pathways. If the answer is no, then we seem to recapitulate the "cultural policy without cultural content" problem.

One way out of this apparent dilemma begins by reflecting on the work that artistic idealism in cultural creativity does and how it does it. We argue that OpenLab Taipei has proposed a cogent, powerful, and locally relevant cultural paradigm of making. And however problematic this paradigm is from the perspective of supporting industrial innovation, the probing of alternative ways of life through the construction of material works and performances is part of the labor that societies depend on artists to do. As we quoted on government official earlier, *we [Taiwanese policymakers] have an inability to appreciate quality*. In this case, an artist *qua* artist is near-universally recognized as leading the construction of a Taiwanese maker imaginary that is generating participating in a movement that CCI policy agencies specifically target because of its innovation upside. How could OT's cultural creativity fall into a blind spot?

We return once again to the issue of appreciation. Hongki's achievements are difficult to perceive, let alone represent. For a bureaucracy that measures success with "key performance indicators" (KPI), OT's contributions become nearly invisible. OT has not, for example, produced a list of successful startups. Instead, OT's paradigm of making is em-bodied in images, myths, echoes, and allusions. OT is not literally otherworldly of course, and anyway the otherworldly qualities its members seek to express can be paraphrased in academic writing. But paraphrases are arid—as arid as an attempt to paraphrase a poem, a sculpture, or a research through design prototype. The cultural creative product is not the paraphraseable content at all; *the cultural and creative product is a new form of life that people learn to share and to do*. Philosopher Stanley Cavell [11] expresses a similar idea in the context of Symbolist poetry, saying that the poems cannot be paraphrased, summarized, put into other words: "these are all out of the question. One may be able to say nothing except that a feeling has been voiced by a kindred spirit and that if someone does not get it he is not in one's world, or not of one's flesh. The lines may, that is, be left as touchstones of intimacy" (p.81). To appreciate OT's contributions is partly to cross into its world, to walk alongside as a kindred spirit, to experience its myths not as data but as touchstones of intimacy.

OT's paradigm creates for Taipei makers locally resonant images, models, and possibilities that relate to the global maker movement. Perhaps a prospective maker in Taiwan cannot see herself in the image of the global maker. But perhaps she can see herself instead among an array of images that we have introduced here: *bando* food fellowship, Treasure Hill's village-sized architectural upcycling, allegories of the "pure maker spirit," satires of cram schools, laser-cut Taiwanese hand puppet stages, creative projects about the colors or the materials of Taiwan, 3D printed waste turned into sculptures by local artists. Such images—maddeningly vague, site-specific, culturally dense, oddly overlapping—do attract people to enter into and and be productive within Taiwan's maker movement. One visitor wants to fix her broken bike. Another wants to debate global climate change. Another actually is pursuing a startup.

If a government can invest US$100 million to build culture and creative parks to attract the public in hopes of generating cultural-creative synergies; and if HCI can theorize about creative communities of practice and interest—then there seems to be a case to invest financial and intellectual resources into rigorously appreciating the image-makers who do the work generating publicly meaningful cultural-creative ways of life—people that we sometimes call "artist," even if we fail to appreciate them in their time.

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