Everyday mundane repair: banknotes and the material entanglements of improvisation and innovation

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**ABSTRACT**

This article seeks to contribute to the conceptualization of everyday repair with a focus on banknotes, a ubiquitous and mundane technology in constant need of maintenance and repair. Through a design anthropology approach, we examine how practices of repairing banknotes are entangled with discourses of innovation that manifest in everyday life. This is complemented with a short ethnographic account of how damage, care and repair of banknotes in Chile are articulated through mundane everyday life activities.

**KEYWORDS**

Repair; banknotes; innovation; ethnography; materiality

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Reparo cotidiano: notas de banco e entrelaçamentos materiais da improvisação e inovação

RESUMO

Este artigo procura contribuir para a conceituação da reparação cotidiana com foco nas cédulas bancárias, uma tecnologia onipresente e mundana em constante necessidade de manutenção e reparo. Através de uma abordagem à antropologia do design, examinamos como as práticas de reparo das notas bancárias se confundem com os discursos de inovação que se manifestam na vida cotidiana. Isto é complementado por um breve relato etnográfico de como os danos, cuidados e reparos de ingressos no Chile são articulados através de atividades diárias.

Reparación cotidiana: billetes y embrollos materiales de la improvisación y la innovación

RESUMEN

Este artículo busca contribuir a la conceptualización de la reparación cotidiana con un enfoque en los billetes de banco, una tecnología ubica y mundana en constante necesidad de mantenimiento y reparación. A través de un enfoque desde la antropología del diseño, examinamos cómo las prácticas de reparación de billetes de banco se enredan con los discursos de innovación que se manifiestan en la vida cotidiana. Esto se complementa con una breve reseña etnográfica de cómo los daños, el cuidado y la reparación de los billetes en Chile se articulan a través de actividades cotidianas.
1. Introduction

In this article, we advance an anthropology of design approach to examine how the cultural creativity of repair activities (and the governmental and corporate discourses of innovation they are entangled in) manifests in everyday life. To do this we build on recent debates in material culture studies, science and technology studies (STS), and design, to interrogate the relationship between categories of innovation, improvisation, and repair as they have been critically advanced in discussions of materiality and technological cultures. In doing so, we draw on both a video ethnography of everyday repair of banknotes conducted in Chile and on an analysis of the discourses of innovation through which they are defined institutionally.

The small scale ethnographic study was undertaken from 9 to 15 December 2015 at multiple research sites in Santiago, in the city of Valparaíso, and the rural towns of Pirque and Maitencillo. All these urban centers are within a 150-kilometer radius.

Banknotes are a mundane but vital everyday technology, selected due to their ubiquity in everyday life and what we will reveal as their ambiguous status; the monetary value of banknotes depends on them being complete but they become inevitably imperfect and frequently in need of repair when they are used. To understand this we take three steps: first, we propose a definition of innovation which interrogates its influence as a societal discourse in relation to its articulation in the improvisatory creativity of everyday life (Ingold and Hallam 2007). Second, we understand “things” as leaky (Ingold 2008) and thus see technologies as “open” to other things and processes, rather than complete or finished artifacts; and third, we understand the way humans work with materials as a form of making whereby “we place the maker from the outset as a participant in amongst a world of active materials” (Ingold 2013, 21).

Our discussion is developed in response to contexts where recent scholarship has highlighted an approach whereby the inevitability of decay, damage and repair is emphasized, and is held up in relief to concepts of innovation and economic growth. Across the social sciences and the humanities literatures that refigure decay and repair as generative have emerged. Graham and Thrift, for instance, position maintenance and repair as key to an understanding of modern societies in the form of “a kind of ‘missing link’ in social theory, which is usually overlooked or forgotten” (2007, 1). The geographical archaeologies of Desilvey propose that “decay reveals itself not (only) as erasure but as a process that can be generative of a different kind of knowledge” (2006, 323) and that we should “accept that the artefact is not a discrete entity but a material form bound into continual cycles of articulation and disarticulation” (2006, 333). In interaction design studies repair as “everyday design” is presented “as not only an act of restoration, but also as an act of creativity” (Maestri and Wakkary 2011, 81). In science and technology studies, Russell and Vinsel (2016) argue for a focus on maintenance, and Jackson sees the world as “always being recuperated and reconstituted through repair” (2014, 175) to argue that the reason why systems around us don’t fail more often is due to the ongoing work of repair (Jackson 2014, 222). For Henke “repair acts as a kind of invisible hand behind the stability of infrastructures” (2019, 258), which we understand here as networks that facilitate the circulation of goods, people and data and as the coordination and control of movement of people and things along and within global financial chains. In material culture studies Domínguez Rubio has called for “an approach that takes seriously the seemingly banal fact that things are constantly falling out of place” (2016, 60), calling for an
approach “that takes temporality, fragility and change as the starting points of our enquiry” (2016, 60).

Here we build on these literatures to show, through the example of banknotes, how damage, care and repair are articulated through mundane everyday life activities, processes and things and the entanglements this has with processes of innovation. These mundane activities of using, inscribing, caring, and repairing banknotes, of course, happen within what Casper Bruun Jensen calls “the unstable, emergent interrelations between infrastructures, their human developers and numerous other entities” (Jensen 2016, 228). These entities can include from ink and polypropylene used in the making of banknotes, to Automatic Teller Machines (ATM’s) that dispense them, and anything in between in a cash supply chain over the production, circulation, management and destruction of banknotes. The breakdown and malfunction of banknotes is a critical case that comes to destabilize depictions of infrastructures as inert or invisible. As Susan Leigh Star’s early work on infrastructures showed, infrastructures become visible through their shortcomings (Star 1999).

In this article, we seek to advance the debate beyond the specialized, previously documented fields or activities of archaeology, technology or “object” breakdown and repair as discussed in the literature above, such as in ship recycling (Jackson 2014), artwork restoration (Dominguez Rubio 2016), or specialized workplace practices (Strebel, Bovet, and Sormani 2019). In contrast, the example of banknotes provides an examination of damage and repair of ubiquitous technology, which is part of the sensory, embodied dimensions of everyday experience, in a context where everyday repair and discourses of technological innovation become entangled and even mutually resilient and sustaining. The example of the everyday experience, use, damage and repair of banknotes is ideal for this task precisely because banknotes are ubiquitous, inevitable and, while culturally specific, a near universal technology. While prominent public narratives emphasize how Sweden, for instance, is moving towards a cashless economy (Gray 2017), and that the value of the virtual currency Bitcoin has dramatically increased over the last year (Rogoff 2017), in fact more banknotes are being printed now more than ever.

The case of Chile is particularly interesting in this respect. Although electronic banking and bank cards are also on the rise in Chile, representing a shift in recent years from payments in cash in some areas, most people handle cash on a daily basis in a wide range of contexts and situations. In contexts where banknotes are frequently handled people engage with their materiality through sensory encounters but do not usually need to comment on these mundane occurrences. Yet, as we found, when asked to show, perform and verbalize their experiences of banknotes people in Chile were also extremely open and keen to articulate the mundane details of how it feels to deal with banknotes in everyday situations.

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1This report by the World Economic Forum shows that between 2007 and 2015, cash in circulation had decreased by nearly 15%, while the number of cash payments in shops had almost halved, from 39% to 20%, while at the same time, electronic payments were surging.

2As suggested for instance in a 2013 Chilean news article citing Guido Romo, the director of Gemines Consultores, a market and public opinion research company, despite there being a greater extent of banking in the country, the preference for cash has remained constant. The reasons for this are related to cash being universally accepted, to there being transactions for which cash is the only available medium of payment, such as for domestic services for example, and principally because it has no maintenance or use costs. La Tercera 2013, 26.02
A second reason why banknotes offer an illustrative case is that banknotes are an example of a widespread and consistent artifact, and they can be defined as a technology. To explain this further, banknotes are not often thought of as a technology – but rather as money (Bolt 2014; Di Muro and Noseworthy 2013), or commodities (Maurer, Nelms, and Rea 2013, 58). They have been defined as “medium of exchange,” “unit of account” and “store of value” (DeVoe and Iyengar 2010; Guyer 2012; Maurer 2006). Yet banknotes can usefully be defined as technologies in a dual sense (drawing from Sneath, Holbraad, and Pedersen 2009, 17). First in the sense that banknotes are designed materials which are engaged in processes of human activity, and have particular technological innovations (e.g. security features) embedded in them. Second, as elaborated below, banknotes could be regarded as technologies that act within processes, rather than acting on other things (Sneath, Holbraad, and Pedersen 2009).

In the following sections of this article, we first outline our theoretical position, and then develop our discussion drawing primarily on our face-to-face and online research about the experience of use, damage to and repair of banknotes in Chile.

2. Innovation, improvisation, and repair

In existing literatures, there have been various uses of the term innovation, which have generally sought to understand the relationship between how change is determined discursively and how it happens in the detail of everyday life. Anthropologists Ingold and Hallam have proposed that we distinguish between innovation as a discourse and a definition put onto things “after the event,” and improvisation as the creative process through which change happens. They argue, “[t]he difference between improvisation and innovation, then, is not that the one works within established convention while the other breaks it, but that the former characterizes creativity by way of its processes, the latter by way of its products” (Ingold and Hallam 2007, 2). Innovation therefore only happens insofar as it is determined as having happened through discourses that in turn have been produced to define it. That is, the ontological status of a technological innovation is that of something determined by a narrative of innovation, it is a categorization of a thing, rather than a definition of the qualities of the thing in itself. Once something is defined as an innovation, this could imply that it has been closed off as an object. That is, the finished object is the innovation. This approach broadly concurs with theories (developed mainly in STS) of innovation and repair having two faces, but uses a different terminology (improvisation) to describe everyday activity. As such, it corresponds with the ideas of the singular action performatively defined innovation which is discursively constructed (Callon 2008), and the “artful integration” which for Suchman and Bishop “emphasizes the ways in which new things are made up out of reconfigurations and extension to familiar environments and forms of action” (2000, 332) and where, as Henke puts it, “the relationship between bodily sense and material settings provides a key indicator when things need to be fixed” (2019, 262). Jackson has similarly argued that for example the dismantling of a ship, by ship breakers, would be as much an innovation as was the production of the ship when it was new (2014, 180). He suggests that in this and other cases innovation can thus be both collective and specific and driven by “breakdown and repair” (2014, 180). Along the same lines is Russell and Vinsel’s argument (2016), “What happens after innovation, … is more important” than innovation itself. They propose that “We can think of
labour that goes into maintenance and repair as the work of the maintainers, those individuals whose work keeps ordinary existence going rather than introducing novel things.” They argue that “the most remarkable tales of cunning, effort, and care that people direct toward technologies exist far beyond the same old anecdotes about invention and innovation.” The anthropological emphasis on improvisation adds to the ideas of “artful integration” as a mode of innovation (Suchman and Bishop 2000), Russel and Vinsel’s emphasis on maintenance and Henke’s (2019) focus on the sensory dimension of repair, because “it distinguishes the improvisatory creativity of labour that works things out as it goes along from the attribution of creativity to the novelty of determinate ends conceived in advance” (Ingold 2013, 20).

The academic literatures on breakdown and repair noted above tend to emphasize ongoing change and emergence, through a critique of earlier waves in material culture studies. For instance, Domínguez Rubio has argued that in place of a focus on the “material agency” of objects “in shaping social relations” we should attend to how “objects are fragile and temporal realities … that objects wear down and change, that they break, malfunction and have to be constantly mended, retrofitted and repurposed, or … are routinely misused, misrecognized and disobeyed” (Domínguez Rubio 2016, 60). Thus, we concur in theorizing that things “should be understood as material processes that unfold over time, while objects are the positions to which those things are subsumed in order to participate in different regimes of value and meaning” (Domínguez Rubio 2016, 61–62). This, nevertheless, raises a further question of how to conceptualize the materialities with which improvisatory human activity is entangled. Here we turn to Tim Ingold’s argument that “things are alive because they leak” (Ingold 2008, 10). Leakage in the sense given by Ingold refers to the permeability of things. This view that “things leak, forever discharging through the surfaces that form temporarily around them” (2008, 4), offers a manifest way to consider repair and the materiality of everyday improvisation. In Ingold’s argument, the processual nature of the materiality of things lies in that “it is in the opposite of capture and containment, namely discharge and leakage, that we discover the life of things” (2008, 13), thus entailing a form of “process-power” (Parikka 2011, 98). This is a movement towards “new ontologies that highlight processes of formation rather than discrete entities, delimited objects or final products – instead, to define matter for its living process in the world formation” (Pink, Ardevol, and Lanzoni 2016, 11). The implication for our analysis here is that it urges us to consider banknotes beyond the idea that they are completed objects derivative from a process of technological innovation, and which will only change when superseded by a new innovation.

Therefore, in our rendering, which focuses on innovation as it occurs through the improvisatory modes of everyday repair and maintenance of banknotes, these become “things,” whereas when rendered through a discourse of technological innovation they are objects. By acknowledging them as things, as well as accounting for the “relentlessness of things” (Domínguez Rubio 2016, 82), the inevitability of their damage and repair seems obvious. However, the example of banknotes also brings into question the relationship between objects and things, it suggests that while it might be possible to read them as “discrepant” and “different” as Domínguez Rubio (2016, 61–62) suggests, objects and things are also necessarily entangled and inseparable. This calls for an investigation of the relationship between what is perceived as a complete object and the improvisatory actions through which it can be defined as an everyday thing. This has a parallel in Gill
and Mellick Lopes’ critique of an “object-oriented industrial society, which perpetuates a leaping from one theatrically perfect, finished form to another” (Gill and Mellick Lopes 2011, 309). For Gill and Mellick Lopes, it is through “wearing,” as “recurrent forms of contact or engagement between bodies and artifacts,” that things come “into experience” and might be repaired or modified. They contrast this to “a profligate industrial economy that makes new, purportedly improved, but inexperienced things insistently available to us” (2011, 308), and call for “a reflective interrogation of designs already made” (2011, 308).

3. What are banknotes? From currency to cultural technology

Banknotes represent various kinds of value, ranging from economic, cultural, and historical value to the specificities of personal and social values. An economic view of the value of banknotes highlights their roles as a medium of exchange and payment, “store of value,” and “unit of account” that they materialize (DeVoe and Iyengar 2010; Guyer 2012; Hart and Ortiz 2014; Haselgrove and Krmnicek 2012; Maurer 2006; Mishra, Mishra, and Nayakankuppam 2006). Currency has been closely linked with the symbolism of national identity (Helhliner 1998), and new banknotes are no exception.3

While cultural, social and historical strands of analysis in the social sciences and humanities emphasize the meanings of banknotes, from a more practical perspective banknotes are designed, and they, or the materials they are made from, are technologies (e.g. see Giusti and Vásquez 2013). For example, arguably the most compelling innovation in the development of banknotes internationally in the last fifty years was the adoption of polymer substrate (clear thin plastic). The material was first used for banknotes in Australia with the first banknotes issued between 1992 and 1996. Australian banknotes were co-developed by the Reserve Bank of Australia (RBA) together with the Commonwealth Scientific and Industrial Research Organization (CSIRO) and the University of Melbourne, and were the first in the world to be printed on polymer substrate instead of paper. In the past 20 years, plastic polymer banknotes have been deployed by more than 24 countries, although it is not used universally or necessarily consistently across single currencies. Further innovations in banknote design, made possible by the use of polymer substrate materials, include increased security features against forgery, and characteristics that make recycling for environmental sustainability a viable option for damaged banknotes.4

Thus banknotes, beyond their economic and symbolic values, are understood within a narrative of technological innovation, whereby their material-technological features and properties are understood to provide solutions to problems associated with their use (e.g. security and sustainability). When understood from this perspective a banknote is positioned as a discrete, and completed object, and as a technological accomplishment. As the various terminologies used to refer to damaged banknotes internationally infer, once they are rendered incomplete their life as a banknote should be over, and banks

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3 For example, in January 2016 in a measure to tackle Argentina’s high inflation and the need to put into circulation banknotes of larger denomination, the recently elected right-wing government of Mauricio Macri determined to include the southern blue whale and the jaguar to replace the historic figures of Hipolito Yrigoyen and Juan Domingo Perón, creating a political controversy that some argued was a first step towards a loss of cultural identity (Emol 2016).

4 See for example Issue 5 of Specimen (2017) where the polymer is promoted as “the world’s most sophisticated banknote substrate and is currently issued on 80 denominations in 24 countries worldwide.”
prefer to remove damaged notes from circulation. For instance, damaged, contaminated or mutilated notes in the UK, or unfit or scumbled banknotes in Australia. In the Chilean case, damaged banknotes can be exchanged at the Central Bank for new ones when they are more than 50% intact. The Bank also recommends that users should accept these banknotes as long as the banknote itself is more than 50% of its original size. But the Bank discourages those banknotes that have been tinted by ATMs and recommend that members of the public, commerce, and banks do not accept these banknotes, as they are suspect of being subjected to treatment to eliminate ink from security systems. Writing on them, modifying them or repairing banknotes intervenes in the process of innovation, thus leaving little room for repair or revaluing of banknotes. They thus stand for a model for which the idea that repair sits as a fundamental element of human relations with things is deeply problematic, and whereby, as Suchman and Bishop propose, conservative discourses identify innovation as happening in “singular inventions or wholesale transformations” where value is given to “discrete discontinuous change events” and “negative value attributed to processes of incremental change” (2000, 332).

Like all technologies, banknotes also become appropriated into personal, social, and cultural ways of living with “things.” Existing literature internationally highlights their relationship to hygiene and the idea that they can be carriers of bacteria (Gedik, Voss, and Voss 2013; Vriesekeop et al. 2010), or “contaminated” with dangerous substances, to their involvement in illegality in cases such as counterfeit (Cowling 2011), or as reported popularly in the news, the frequency of banknotes carrying evidence of cocaine consumption worldwide (Travis 2011). The appropriations we are more concerned with here involve practices of maintenance, preservation, and repair (which are also sometimes related to preferences for particular notes because of their design, material, condition or even personal meanings, that freeze their circulation, as in cases of numismatic collections, luck, and superstition or as “store of value” and savings). The investment of such personal meanings can influence the circulation patterns and spending motivations of banknotes. For example, Canadian research found that the condition or wear of banknotes led to preferences to keep or motivation to get rid of notes, regardless of their nominal value (Di Muro and Noseworthy 2013). Di Muro and Noseworthy (2013) have suggested that such responses were influenced by notions of disgust of contamination when having a worn note, which contrasted with feelings of social pride when having a crisp one.

As transactional devices, banknotes are performative. They are implicated or embedded, and as Micel Callon would argue, “actively engaged in the constitution of the reality that it describes” (2008, 311). But banknotes are also analytical devices in an anthropological sense (Sneath, Holbraad, and Pedersen 2009, 18), whereby technologies are considered not to be opposed to, but to be of, the social. As Sneath et al argue, in anthropology “technologies have been seen as systems of efficacious knowledge which, although they may involve artefacts, cannot be reduced to them” (Sneath, Holbraad, and Pedersen 2009, 16).

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5See for example policies for damaged banknotes in the UK http://www.bankofengland.co.uk/banknotes/pages/damaged_banknotes.aspx and in Australia http://banknotes.rba.gov.au/damaged-banknotes/damaged-banknotes-policy/.
For us this means that rather than acting on other things, banknotes can be understood as technologies that are in or within other things or processes. As we elaborate below, from this perspective the notion of the banknote as a technology becomes decentered. Rather than being the central innovation to be studied it becomes part of other processes and things and thus, through the closer focus on the materiality of banknotes developed in the next section, it becomes possible to see how processes of damage and repair resituate banknotes as a technology for the constitution and accomplishment of everyday life processes.

4. Chilean banknotes: damage, repair, and revaluing

There has been a growing interest in ethnographic approaches to mundane repair (Strebel, Bovet, and Sormani 2019), undertaken within a multi-methods approach (Henke 2019, 274), that seek to reveal the “multiple levels” at which infrastructural repair takes place and such as “local practice and institutionalization” (Henke 2019, 275). In December 2015, we undertook a focused “short-term ethnography” (Pink and Morgan 2013) project in Chile involving a total of 38 participants dispersed in participant observation, video recordings showing how they used banknotes, and short semi-structured interviews. This field work was interwoven with our analysis of online materials relating to Chilean and other countries’ banknotes, and the discourses through which innovation in banknote technology is discussed. The study was conducted at research sites where large amounts of cash are handled. These included sites such as inside taxis, at banks, supermarkets, gas stations, and restaurants. Participant observation was also carried out in sites such as La Vega Central market, Servipag and Centro de Pagos Bip, and the Central Bank of Chile (the branch were damaged notes are exchanged). It was possible to video record a number of participants counting and handling banknotes. These provide initial examples of how notes are handled and the problems that participants identified in some contexts.

Drawing on visual and sensory ethnography techniques (Pink 2013, 2015), we created intensive encounters between participants and the researcher who was already experienced in the cultural and material context, in order to learn about usually unspoken and invisible elements of mundane everyday banknote use, which we interpret in relation to online materials gathered for the same period. Because banknotes are mundane ubiquitous everyday artifacts, or things, they participate in our lives in ways that are often not verbalized. They are used as a matter of course, within the flow of encounters between people and things, and during this process often move in between and with people. They are counted, bundled, put in wallets and in pockets by users who are continually engaged in their sensory and affective evaluation. For example, in Chile we found people tended to maintain an unspoken level of awareness of needing to attend to and evaluate notes when handed them as change as an intrinsic way to detect counterfeits. This might only become apparent when something untoward happens, yet it is part of a visual and sensory way of knowing about/with an everyday technology. However, in one of our ethnographic taxi rides through Santiago, we were handed a counterfeit

Servipag is a payments portal leading company in the market of transactions, payments, and collections both across a range of branches and online. It was created in 1990 by two of the country’s leading financial institutions, Banco de Crédito e Inversiones and Banco de Chile, as a company oriented to support the national bank transfer.
banknote of 5000 denomination (US$7 at 2015 exchange rates) as change after paying the fare. In the haste of the moment we did not stop to feel and look at the banknote and only realized a few moments later. The feel of banknotes is integral to how they are experienced, and in Chile participants often described banknotes to us verbally in relation to their texture, yet when participants showed us how they handled them, it was clear that much of their sensory knowledge about them was not usually verbalized because it was used in situations where they would usually have little reason to discuss the banknotes themselves (Figure 1).

In our study, we also implemented short semi-structured questionnaires \((n = 11)\) with eight questions. We also conducted five video ethnography re-enactments. In short-term ethnographic studies, re-enactments can provide insights into activities that people usually perform on a routine basis but do not usually show other people or explicitly think or talk about it. This method was used by asking participants (involved also in the questionnaire) to show and discuss the ways that they handled banknotes, while (when they agreed) also being video recorded, across a range of contexts.

Chile has mixed banknote materials. Polymer substrate banknotes for the 1000, 2000 and 5000 Pesos denominations were put into circulation by the Central Bank of Chile between 2009 and 2011, to mark the bicentenary of the country’s independence in 1810. Banknotes of 10,000 and 20,000 Pesos denomination are still made from paper. Even though electronic banking and bank cards are on the rise, meaning that there has been a shift in recent years from payments in cash in some areas – notably when paying, for instance, in restaurants and for petrol – most people handle cash on a daily basis in Chile in a wide range of contexts and situations and repaired or damaged banknotes are part of these encounters. For example, one participant, Karla, described to us how, every Friday, she went to her local bank to withdraw 400,000 pesos (US$650 at 2015 exchange rates) in banknotes of 1000 denomination to be used for petty cash in her seafood restaurant in Santiago. She had been doing this for the last five years since she and her sister took over the business from their parents.

The Central Bank of Chile (Banco Central de Chile) exchanges damaged notes for new ones if they have more than 50% of the note intact, and media reports state that 1,600,000 banknotes not fit for circulation are processed and destroyed per day (0.002% of the stock of notes in circulation) (Morgado 2014). According to the Central Bank of Chile there are nine criteria to indicate that a banknote is generally damaged: stains; adhesive tape; folded or cut corners; writings or graffiti; tearings; staples; burns; deformations; and holes

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7As the Reserve Bank of Australia’s counterfeit detection guide outlines, the feel of banknotes is a significant feature. Australian banknotes, like Chilean ones, are printed on a polymer substrate and have a distinct feel. A suspect banknote may feel excessively thick or thin compared to a genuine banknote, but in our case in Santiago it initially felt very real. See Reserve Bank of Australia Counterfeit Detention Guide and the Central Bank of Chile counterfeit guides in Billetes y Monedas website.

8These questions were: (a) How often do you handle banknotes?; (b) Have you ever received bank notes that are stapled together, or attached in other ways?; (c) How do the banknotes feel i.e. texture, strength, how would you describe them, what do you like/dislike about them?; (d) How do you attach bank notes to each other, and what technologies do you use? Why?; and (e) How do you separate bank notes from each other, and is this difficult or easy?; (f) What changes would you make to them?; (g) How do you think banknotes would be different in the future?; and (h) Have you seen or heard any campaign about not stapling notes? If so, in which media?

9Re-enactments included: (a) A restaurant cashier de-stapling a bundle of ten 1000 pesos notes received the day prior; (b) a restaurant owner counting 1000 pesos notes and showing the perceived problem of banknotes sticking together and being slippery and difficult to bundle; (c) a bank cashier showing how 1000 pesos notes usually get stuck in counting machines; and (d) a taxi driver talking about taping and repairing notes and explaining the texture of notes.
Central Banks generally make recommendations to prevent damage to banknotes, thereby increasing lifespan, for instance, informing users not to crumple, staple, scratch, or write on them.

The notion of a banknote as a discrete object is most obviously challenged when they tear or are otherwise damaged. Torn banknotes (Figures 2 and 3) cannot be used in certain machines (Figure 4), however many banks, commercial service providers and people accept, use and repair damaged notes.

The example of torn banknotes and their subsequent repair demonstrates how banknotes both become broken and become part of configurations of things that flow into each other in ways that are not compatible with the idea of the finished product associated with an innovation agenda. Stapling is recognized by the Central Bank of Chile as one of

(Figure 1). A participant (restaurant owner) demonstrated counting banknotes for us on video. We observed how she handled the notes, and the unspoken ways of knowing that were part of this, as she carefully counted and folded them in the cash register. She was the first to acknowledge the issues with banknotes being too slippery and difficult to count, compared with traditional paper banknotes. And she demonstrated how they easily tear down when stapled. Image: screenshot by Juan Francisco Salazar, December 2015.

(Figure 2). Central Banks generally make recommendations to prevent damage to banknotes, thereby increasing lifespan, for instance, informing users not to crumple, staple, scratch, or write on them.

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many common types of usual damage in both polymer and paper banknotes which leads to tearing when banknotes are carelessly separated, or separated when the user is unaware of the staples. For instance, in our ethnographic observations, as we accompanied Karla, the restaurant owner, to the bank to video her cash transactions, she described how the previous day the restaurant had run out of cash so she had sent a waitress to a local center where people can purchase transport cards for the Trans Santiago bus system and where large amounts of cash are handled. The restaurant cashier, who worked for Karla, then explained what had happened when the cash was brought into the restaurant:

Only last week I received a bundle of ten 1,000 notes that came stapled, for the first time. One of the waitresses went to change a 10,000 note at a Pay Centre and came back with the stapled notes. I didn’t realize they were stapled and when I took the first one off it tore. Then I removed the staple and the others seemed fine.

He demonstrated on video how he had removed the staple with minimal impact on the remaining notes. For our participants, stapling was a known but not often visible activity. One participant suggested it was common in the payment of casual salaries, particularly in the retail sector. A woman cashier at the same Pay Centre told us she had never seen or stapled notes herself, but that perhaps some of her colleagues had. Likewise, a person from another Pay Centre told us:

I’ve heard that sometimes notes are stapled to keep them together, so they don’t get lost or to avoid confusion about the amount paid, but I haven’t seen it. But I get to see a lot of damaged, cut, crumpled notes.

Figure 2. An example of a torn Chilean 1000 Pesos banknote that we received from a supermarket cashier in the small town of Maitencillo, Central Chile, 180 kilometers north west of Santiago. Image: Juan Francisco Salazar, December 2015.
¿Qué debo hacer si tengo un billete deteriorado o dañado?

### BILLETES QUE SÍ DEBEN SER RECIBIDOS

#### BILLETES DESGASTADOS Y DAÑADOS
Los billetes que presentan manchas de aceite, pintura, alimentos o cualquier otra sustancia, si tienen valor, siempre que sean evidentes que no hayan sido entintados por el uso de tecnologías de seguridad de cajeros automáticos.

### BILLETES MANCHADOS
Los billetes que presentan manchas de aceite, pintura, alimentos o cualquier otra sustancia, si tienen valor, siempre que sean evidentes que no hayan sido entintados por el uso de tecnologías de seguridad de cajeros automáticos.

### BILLETES QUE NO DEBEN SER RECIBIDOS

#### BILLETES ENTINTADOS POR CAJEROS AUTOMÁTICOS
Billetes que presenten manchas de aceite, pintura, alimentos o cualquier otra sustancia, si tienen valor, siempre que sean evidentes que no hayan sido entintados por el uso de tecnologías de seguridad de cajeros automáticos.

### BILLETES QUEMADOS
Billetes que presentan manchas de aceite, pintura, alimentos o cualquier otra sustancia, si tienen valor, siempre que sean evidentes que no hayan sido entintados por el uso de tecnologías de seguridad de cajeros automáticos.

### BILLETES CON PORCIONES FALTANTES (MUTILADOS)
Los billetes con cortes o megapies que hayan superado el desproporcionamiento de alguna de sus partes son válidos, siempre que no supongan más del 50% de su superficie en una sola pieza.

### BILLETES RECONSTRUIDOS O FORMADOS POR LA UNIÓN DE DOS O MÁS FRACCIONES
Los billetes reconstruidos, formados por partes de otros billetes, en el caso que cada fracción tenga una superficie inferior al 50% del billete, son válidos, siempre que no supongan más del 50% de su superficie en una sola pieza.

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**Figure 3.** An infographic designed by The Central Bank of Chile to advise citizens on how to detect banknotes that are damaged beyond 50% and deemed of no legal value for financial transactions. Source: Educational material by Banco Central. [https://www.billetesymonedas.cl/Documentos/20171130_bcch_canje_billetes.pdf](https://www.billetesymonedas.cl/Documentos/20171130_bcch_canje_billetes.pdf)
Folding is another common way of handling banknotes in Chile, as we viewed notes being counted we saw how they were folded in bundles that bent over in the middle, rather than in flat piles (Figure 1). The banknote in Figure 2 shows a fold near the tear at the top center. Although people are advised not to fold banknotes, men participants described how they carried folded notes in their pockets, which

Figure 4. Technological encounters – “Do not insert torn notes” sign at an underground parking lot in a shopping mall in Santiago. Image: Juan Francisco Salazar. December 2015.
could lead to tearing, as one commented. Stapling and folding are everyday solutions: stapling makes banknote use viable by attaching notes to each other and to envelopes where notes are inserted and stapled closed; and folding makes it easier to keep banknotes in pockets. However, in an innovation narrative their consequences are ironic, since while stapling and folding enable the local use of banknotes as currency they simultaneously cause damage to them.

Once banknotes are torn, there are three options. One is to put the note back into circulation quickly. The existing literature shows that, for instance, in Australia banknotes continue to circulate when “unfit” until returned for destruction (Rush 2015) and as noted above, people tend to pass on damaged notes (Di Muro and Noseworthy 2013). Another is to take the notes to the bank to exchange them for new notes, however participants only tended to do this when they would be going to the bank anyway to collect, change or deliver cash. A common third option is to repair notes with Scotch tape. Even where participants said they did not use it to tape banknotes, Scotch tape, was commonly found at our research sites, as an everyday technology and was a dominant mode of repair. This mode of repair is also supported by the Central Bank guidelines for repair (Banco Central de Chile). For example, a taxi driver showed us where he kept Scotch tape, readily at hand in his cab (Figure 5). The publicly available online forums we reviewed included discussions and advice about how to repair a banknote with tape – often emphasizing the quick-fix or ease of doing so. Yet, while taping keeps banknotes in circulation and provides a solution for users, it is also problematic because it means that taped notes can cause disruptions to cash dispensing machines, instead of their being exchanged at the bank for new ones and being recycled.

Such modes of banknote repair do not restore the banknote to its previous form, but rather enable its continued use. In common with the library book repairs described by Fürst, the banknote is “a disintegrating state of affairs which needs to be stabilized” (2019, 65). In the case of library repairs “The main objective is… not the elimination of traces of usage, but the prevention of further decay” (Fürst 2019, 67). For both library books and for bank notes this temporary repair is satisfactory within certain regimes of value. However, in the case of banknotes the incompleteness of repair is harder to both separate from and reconcile with infrastructures and institutions that frame banknotes as a complete technology. Next, we use these findings to reflect on the relationship between technological innovation and a world viewed through processes of damage and repair.

5. Discussion: inseparable categories

Stapling, folding, taping, and related activities like carrying banknotes in pockets and bundling them up with elastic bands are part of mundane everyday use of banknotes in Chile. They make it possible for people to engage existing materials and ways of knowing together with banknotes in order to effectively participate in everyday life. We have shown how these different things and processes leak into each other, as folding and pockets, bundles and elastic bands, stapling and envelopes, become the configurations of things with which banknotes move through the world, and which in the example of Chile, practically support the circulation of currency. From a more abstract
perspective, these are the configurations through which banknotes as things that are open to other things become flowing currency. It is only when they are actually used in everyday life, where they encounter other things – like scotch tape, pockets or elastic bands – and leak in and out of them, and become part of creative and improvisatory processes, that banknotes function as currency for ordinary people. Again, the irony is evident, for banknotes to emerge as currency that flows in everyday life contexts, they are sometimes used in ways that unintentionally break them, which makes them unable to retain the completeness that qualifies them as currency. Indeed, by way of contrast, those banknotes that are circulated less tend to be damaged less – that is, for much longer they remain representations of the innovation, that can maintain the myth of its completeness and discrete status as an object.

Our fieldwork was in Chile, which as we noted above was an ideal context due to the significant continued use of cash there and, as we have shown in this article, where everyday improvisatory uses of banknotes are flourishing. There are to our knowledge no
comparable ethnographic studies that would provide us insights into how everyday use plays out in other contexts. There are however examples of how banknotes have intentionally been implicated in creative interventions. By juxtaposing these with the examples of tacit everyday use of banknotes discussed above, we can see how a similar tension emerges when activist or art practices modify banknotes. Here the tension is between the idea of the banknote as a discrete finished object on the one hand and as accruing value when they are modified through use on the other. For instance, in Canada in 2015, locals in the Gaspésie region of northern Quebec created a local currency – the “demi” – of cut in half banknotes, which are treated as being worth half their original value. Their users could benefit from the security features of the notes (that is, from technological innovation), while appropriating/breaking them and opening them to alternative meanings as they sought to set up a local economic system (Sifferlin 2015). Another example can be seen in the practice of the Dutch artist Christian Nold who developed the Bijlmer Euro as an improvised local currency that incorporated existing legal banknotes, in this case by adding a technology to these notes that made them traceable (Yamamoto 2015).

As these examples reinforce, banknotes are ambiguous technologies in relation to their status as finished/complete or broken/repaired. In either category/condition they are unsatisfactory because they depend on both discourses and categorizations for their functionality. These two categories are often set up as being opposed. As we outlined above one has been associated with a narrative of technological innovation and economic growth while the other has emerged from a theoretical broken world perspective that urges us to put repair at the center of our inquiries. However, we argue that these discourses and practices that make and alter (banknote) technologies are better understood as co-framing the very ways in which banknotes emerge into, are used to perform tasks, and are removed from, everyday life.

Ubiquitous everyday life technologies like banknotes are always open to being somehow modified by humans, materials, processes, and other conditions of their trajectories through the world. Yet simultaneously as legal currency they are endowed with measurable values and as such must assume the status of being complete objects, for which there are techniques of evaluation of their sufficient completeness to render their value creditable (e.g. that they are 50% intact). That is, money in the form of official currency cannot be leaky and unfinished, it can only be considered as damaged, mutilated or contaminated when it becomes porous with other things. Yet at the same time the technologies through which its value is mobilized in everyday processes cannot be closed or finished.

**6. Conclusions**

Banknotes are a technology that affords an imperative to engage with their materiality both as an object produced through a process of innovation and as a device “used” to achieve certain objectives. Innovation is a dominant societal (and political and economic) discourse and category through which the very production and design of banknotes is made possible. When understood from the perspective of a performative discourse of innovation, technologies like banknotes are produced as completed and finished objects. They can break precisely because they are expected to be
finished, and when broken they are spoiled and not considered repairable. If, conversely, banknotes were intended to change, that is to continue to emerge in their form through the relations they entered into with other objects, things, processes, persons, it would be impossible for breakage to spoil them, precisely because breakage would already be part of their quality as a thing.

As we have shown, a focus on breakage and repair shows very well how banknotes can be understood as “things” – open to the world and to being shaped by other “things,” as used, maintained, and repaired. However, while banknotes offer us an example of an everyday technology, which can be damaged, repaired and maintained, they also live a double life whereby they are situated in the world through a discursive and material-technological trajectory as an innovation, which is finished and complete. They both need to be discrete objects and need to be inserted into the flow of everyday life processes and configurations where they run the risk of being broken objects, and take on the ink marks, staple holes, tears and tapings of the everyday world of which they become part – because these are the very companions in that world that enable them to do their job in everyday life – that is to be currency. Mundane everyday life, has been seen in cultural studies and anthropology as a site where “political interests ultimately land” (Gregg 2004, 379), and where “things become rapidly mundane” through “culturally inflected genre[s] of usage” (Miller and Horst 2012, 29).

As the example of Chilean banknotes reveals, as well as this, the everyday is also a site of damage, repair and maintenance, and these processes are equally implicated in the politics of the narratives of technological innovation and those of culturally specific forms of use. This final point refers as much to our investigations in the everyday present, as to our considerations for the everyday near and far futures. In the introduction to this article, we flagged how banknotes are used in a context in which digital money is increasingly present, be this through online or credit card based transactions or through the contemporary growing interest in cryptocurrencies such as bitcoin. As our research has shown, there is, in the case of banknotes a tension between the technological innovations that make banknote designs possible and the ways that banknotes are repaired and maintained so they may be used in the activities that people perform in order to accomplish everyday tasks, and as such are integral to how everyday life continues. If, as suggested by the theories of breakage that we have discussed above, repair and maintenance need to be at the core of our research agenda, then there are interesting implications for what research into the future of money should investigate. That is, we need to focus beyond what cashless currencies might make technologically possible, to ask how they will manifest themselves materially, how processes of maintenance and repair will play out through them in everyday life and what the infrastructural implications of this will be.

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