

Care Layering: *Complicating* Design Patterns

Maya A Kaneko

School of Art + Art History + Design
University of Washington
Seattle, USA
makaneko@uw.edu

Daniela Rosner

Human Centered Design and Engineering
University of Washington
Seattle, WA
dkrosner@uw.edu

Caitlin Lustig

Human Centered Design and Engineering
University of Washington
Seattle, USA
celustig@uw.edu

Audrey Desjardins

School of Art + Art History + Design
University of Washington
Seattle, USA
adesjard@uw.edu

Abstract

Over the past two decades, discussions of design patterns have turned from encouragement (what to do) toward discouragement (what to avoid). Termed dark, deceptive, or otherwise harmful, user experience (UX) patterns that serve to monetize engagement while reproducing and sedimenting structural inequities are prevalent, which calls for a shifting conversation around UX development and learning. This pictorial uses a visual case study of a childcare worker platform to help critically contextualize largely abstracted or universalizing UX patterns. Developing a form of critical documentation we call Care Layering, we show how approaching UX patterns as embodied and culturally-situated resources sheds light on both limitations and opportunities around gig work platform engagement. We end with a discussion of how Care Layering helps designers work towards greater accountability in UX design.

Author keywords

UX design, deceptive patterns, childcare worker, gig work, accountability, care.

CSS concept

Human-centered computing, Interaction design

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the Owner/Author.

DIS '24, July 1–5, 2024, IT University of Copenhagen, Denmark
© 2024 Copyright is held by the owner/author(s).
ACM ISBN 979-8-4007-0583-0/24/07.
<https://doi.org/10.1145/3643834.3660740>

Introduction

With a growing awareness of technological harms, design fields have turned to patterns that help identify and address problematic user experience (UX) design. Termed “dark” or “deceptive,” these patterns document common UX decisions that reinforce harms, such as a binary gender toggle that excludes non-binary users or a racial demographic menu that excludes mixed race identifications. Deceptive patterns can ‘trick’ users into performing certain actions, such as subscribing to ongoing communications from a company, paying more for a product, or sharing data with a company unknowingly. Recent scholarship has acknowledged limits to this documentation, observing that it focuses on interface issues that do not address wider structural concerns (e.g. fixing a demographic check box does not fix structural racism) [2,20,22].

Approaching UX decisions through these wider social and structural effects, this pictorial offers a reading of patterns in expanded context. Informed by an interview study with childcare workers [16], we use a visual analysis of a popular childcare worker matching platform to illustrate how exposing the structural conditions of UX harms — inequities that get reinforced and exacerbated by interface design decisions — requires additional translation beyond mock-up images, a form of modeling that we term Care Layering.

To illustrate this layering, we use abstract yet simple digital transparencies to make visible the often ignored structural context in which deceptive patterns occur. Most illustrations offer additional layers through which we can look at deceptive patterns: some show what is missing directly on an individual screen, some offer views into broader systems, and some put visual elements back into the temporal flow of navigating an app. We use these illustrations to zoom in or out from the app screen, as a strategy for showing this expanded context. Alongside traditional visual representations such as sketches or annotations, we include Care Layering collages in the form of imaginary abstracts. According to Mark Blythe [4], imaginary abstracts are summaries of fictional

design research findings about prototypes that do not exist. Our analysis of Care Layering uses this fictional but empirically-grounded context to situate, and make visible common UX design techniques in relationship to users’ positionings, perspectives, and wider structural conditions. We utilize imaginary abstracts to bridge between industry UX decisions and academic discourse, and further suggest how this link can be developed. This approach to visual analysis helps designers call out the multi-layered potential harms of UX design if left unaccounted for.

In this pictorial, we turn to a case study of the popular digital labor platform Care.com that specializes in matching care workers with potential employers. Platforms like this have been considered part of the “care economy” [33] which is estimated to be a \$648B market in America [34]. A key part of this economy is childcare work, which we define as the supervision and tending of children by someone other than the child’s legal guardians. We draw from the complexities of “care” as a site of intertwined relations [13,18], balancing love (for the child, for the family, for the role) with extraction (of emotional labor, of physical labor, of psychological space) to frame the very methodological tools we use to understand it. Mimicking the isomorphism of our visual analysis, care serves as an embodied act of inquiry and a topic of study.

Care Layering grows from efforts to put our investigative context (childcare) in conversation with critical care scholarship [13,30]. For us, care does not refer to childcare labor, but instead to an analytic strategy of reciprocity that emphasizes acts of feeling with another while grappling with existing power structures. By Care Layering, we refer to the work of bringing this concern of mutuality to inequitable dynamics supported by common interaction design decisions.

This pictorial contributes the following:

1. Close visual analysis of the childcare work platform Care.com, revealing structural inequities potentially perpetuated by UX design decisions.
2. Conceptual shift from decontextualized deceptive patterns to culturally situated, structurally-conditioned Care Layering. This analysis reveals the importance of providing additional context on patterns that an analysis of visual diagrams alone might miss.
3. Expansion of imaginary abstracts as a technique for broadening and reworking how designers build accountability into UX pattern tools.

Background

Design Patterns

‘Pattern’ traces back to the Latin word “paternus,” meaning “of a father,” referring to the act of serving as a model or an example. This Latin root evolved through Old French as “patron,” meaning “a model or form.” The term was used to describe the original model from which copies were made. Within design fields, the term pattern refers to frequently encountered design techniques that aim to ensure that a designer’s work is inclusive, robust, reusable, and/or maintainable. The term grows in large part from Christopher Alexander’s book *A Pattern Language* [1] where he defined patterns as a rule or guideline for how to solve urban design issues, which were often based on the impacts of past design challenges. Design patterns in UX are sometimes thought of as good ‘rules of thumb’ or ways in which designers can create efficient user interfaces (UI) without ‘reinventing the wheel’ for each project. These patterns are often supported by years of user research or marketing psychology which indicate that people (users) are able to find what they are looking for quickly and without much friction [35].

With the rise of common UX patterns, recent scholarship has highlighted that these patterns can be used deceptively to mislead and force users into taking unintended actions [11]. The ‘dark’ patterns we analyze are often described as “tricks used in websites and apps that make you do things that you didn’t mean to, like buying or signing up for something” [36], and will be referred to as “deceptive patterns” in this pictorial in solidarity with critiques of using racialized connotations associated with darkness within a technology industry infused with whiteness [21]. Other works have pointed to the fact that UX design patterns are typically reactive rather than proactive and thus have limited influence over new pattern developments [29,31], tending to leave underlying issues (i.e. systemic inequities) largely unaddressed [2]. To emphasize this wider embodied context, our work draws from the metaphor of layering (as a digital design tool, as a lens to apply, as an added complexity), appending annotations and illustrations to the crisp edges of UI design.

Design for Childcare Work

Over the past few decades, childcare labor has taken on new and varied forms with emerging digital tools. Digital labor platforms such as Care.com have enabled the formalization of informal childcare work by augmenting and often displacing organic word-of-mouth recommendations with algorithmic sorting and matching between workers and employers [18,25]. Care.com, founded in 2006 [37], is one of the largest care platforms in America with over 11 million care worker profiles registered as of 2020 [27], and was acquired by IAC in 2019 for around \$500 million [32]. Care.com is known for its “on demand” marketplace where employers can find available care workers in a short amount of time [5]. In the past decade, more platforms have been created in a similar vein—Urban Sitter, Parent Village, and more. In addition, some childcare workers also use platforms that are not designed just for care workers or for finding employers, such as Facebook groups [16,26].

We see ourselves as in conversation with Julia Ticona and colleagues’ work on care platforms, which centers around the relationships between the features of the platforms, the algorithmic visibility of childcare workers, the formalization of care work through the platform (also see Flanagan [9] for histories of this formalization), and the commodification of trust between employers and childcare workers [28]. Building upon this work, Fetterolf [7] examines the metrics that Care.com tracks that may make workers more visible, such as connectivity, response time, and positive reviews—metrics that are not applied to employers. Digital labor platforms exacerbate power and information asymmetries by providing workers and employers with different interfaces and features [12,14,17]. Our visual and conceptual approach in this pictorial further expands on this work and deconstructs what is embedded within an app’s UX.

Methods

1



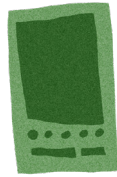
Interviews with 16 childcare workers. The interviews focused on workers' experiences using online matching platforms. Participants interviewed were distributed across the USA and were recruited from a large subreddit, word of mouth, and Facebook groups for nannies. Each interview was remote, lasted 45-90 minutes and covered topics such as the process of finding work, advocating for themselves, and discrimination and/or microaggressions they have faced at work. These interviews are analyzed and discussed in our other work (see Lustig et al. [16]).

3



Each screen in the registration flow was documented in an online whiteboarding tool. While we conducted an analysis of three platforms, we chose to use Care.com as our main case study for this pictorial because it surfaced as one of the most used platforms with our interview study participants, and is overall one of the most widely known childcare work platforms, paving the way for similar platforms.

2



Self directed cognitive walkthroughs of three platforms. We conducted self-directed cognitive walkthroughs of the registration process for Care.com iOS application, Parent Village iOS application, and Urban Sitter website. This walkthrough was conducted in the spring of 2023, and therefore, the screens themselves may have changed since then (as platform design often undergoes ongoing adjustments). We argue that while the UI elements may change more rapidly, the underlying asymmetry between childcare worker and employer sides of the platform may be slower to change.

4



Flows were evaluated and individual screens were annotated and discussed with our research group. Annotations called out points of discussion and documented what we were feeling during the registration process. We paid particular attention to issues of asymmetry, discrimination, lack of agency, and extractive practices. We also included findings from the interviews to confirm and augment our observations.

Care Layering in Practice

In the following pages, we share Care Layering on top of deceptive patterns that we found in our analysis. We use the visual language of layered pattern pieces (the individual sections of a textile design, often rendered using tracing paper) to illustrate our proposed approach: working with colored blocks, hand-drawn sketches and imaginary abstracts in superposition. We chose to use screenshots of the mobile platform in order to illustrate the 'real' user interface, and use handmade layers of analysis, allowing us to not only be in conversation with the designs, but reflect our sensemaking process in our group discussions [10]. While we are unable to see the entirety of the flows (following consentful research procedures [8]), we hope to complicate and make sense of specific design decisions through the layers, gesturing toward a future where designers acknowledge and reimagine deceptive patterns that remain otherwise unchecked. Through analyzing the platform 'vertically,' 'across', and 'temporally' we present the following analysis:



Vertically evaluating what's 'underneath' the specific user interface elements.



Cross examining and comparing both 'sides' of a dual-sided platform.



Documenting user experience in context of the entire flow and larger journey.

We turn to imaginary abstracts as a technique for examining "prototypes that do not exist and studies that never took place" [4]. Recently, scholars have adapted the technique to examine the ethical consequences of particular methodological techniques such as participatory inquiry with hate groups [23]. The two imaginary abstracts (that we present on pages 10 and 11) help intensify our critical engagement with design decisions and their effects, and illustrate a future where these deceptive patterns remain unchecked in corporate settings and academia.

Making Visible Invisibilized Structures

Vertically evaluating what's 'underneath' the specific UI elements.



Through analyzing the individual screens 'vertically,' we understand that elements are the visible components of larger socio-technical constraints, assumptions, and power relations that are baked into a system's design in ways that may not always be readily apparent to users.

We cannot know for certain to what extent the visible elements of the UI correspond to how data are stored or operated on in the backend. But even without knowing the internals of a system, a visual analysis of a UI can point to what is portrayed as meaningful and what is portrayed as unimportant for the system to function, and what is opaque and what is transparent to users.

Gender Toggle

Child care workers are required to specify if they identify as either male or female in the account registration process. While this piece of UI is one element of many in the larger registration process, its presence signifies a lack of algorithmic and database capacity to hold data that better represents a wider range of identities [3], such as those of nonbinary childcare workers.

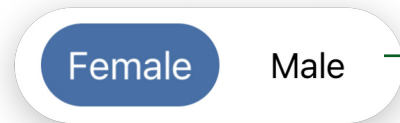
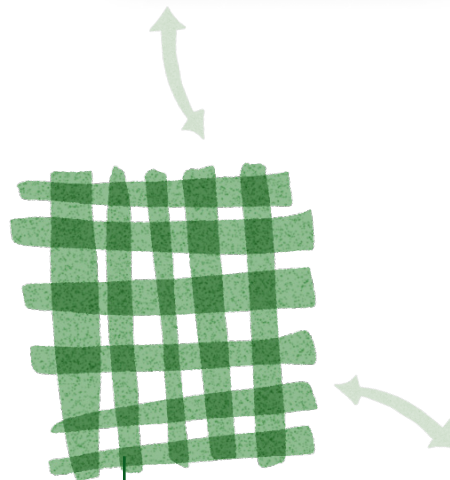
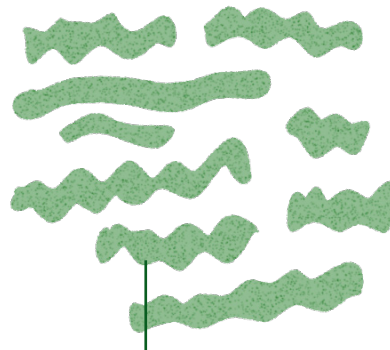


Fig.1: Toggle [39]

The toggle is a common UI pattern, sometimes used for 'on and off' switches. The app states: "For the time being, we are able to provide these two options. We acknowledge that there are many more identities and are actively investigating ways to accommodate the full range of gender identity" [39]



The database is the collection of possible entries that the system can hold



The algorithm dictates how the database is parsed and made sense of

Tracking online activity

We also saw invisibilized structures play out in how tracking was incentivized for childcare workers. The first page of the childcare worker registration screen, which is shown prior to the operating system pop-asking to allow tracking, does not provide further information about which kinds of online data are collected or why these data would help Care.com provide better matches. This screen points to the ways that users more broadly are subjected to surveillance in algorithmic systems and the societal structures that normalize the surveillance of workers.

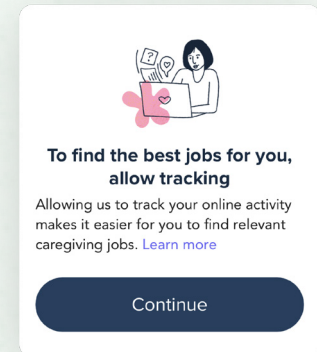
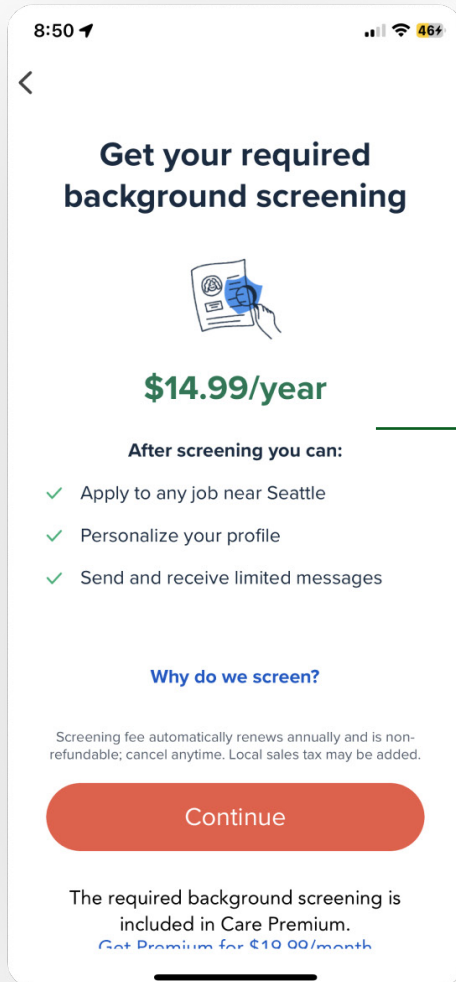


Fig.2: Pop-up [39]

Care.com outlines the various ways in which data is used, but it is behind the 'learn more' link and within an extensive webpage [38].

Attending to Amplified Asymmetries

Adding the childcare worker and employer dynamic, we see that these asymmetries can have an exaggerated impact.

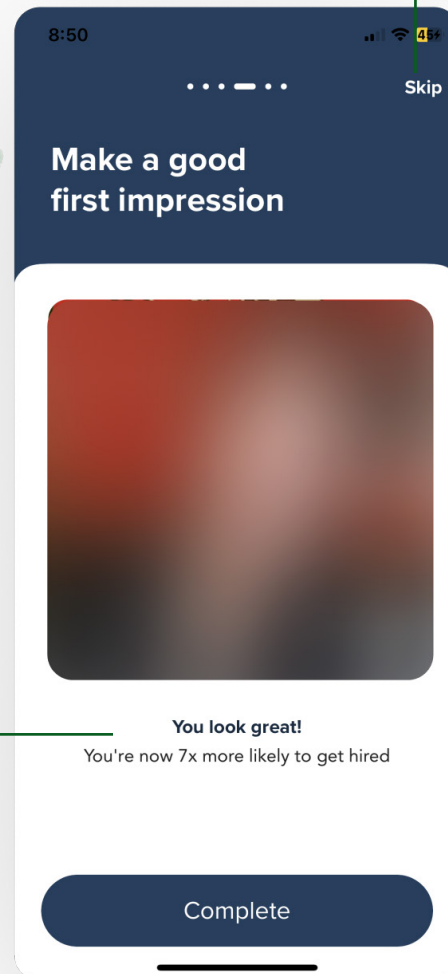


No required screening for employers

Lacks information about what the screening consists of

Adding a photo is incentivized by hiring metrics

Fig.3: Background Screening, Childcare Worker Registration [39]



While the background screening is a hard stop, here a childcare worker can skip

Fewer incentives for employers to upload photos

Fig.4: Add Profile Photo, Childcare Worker Registration [39]

Background Checks

Care.com CEO Tim Allen stresses the importance of background checks for childcare workers, emphasizing that safety is the top priority for the company [5]. These background checks, though, are required on the childcare worker side of the platform and not on the employer side of the platform. While this is not a new observation [27,28], we find it necessary to additionally highlight the lack of information provided in the UI about what personal information will be required of the childcare worker.

"Most households are not background checked, and I wish they were...There was one family I worked with for two years, that was absolutely traumatizing, horrible. I actually just testified against the dad in court."—Emma, Nanny

Profile Photos

As a childcare worker progresses through the registration flow, they are highly encouraged to upload a profile photo. The platform messages that they are more likely to be hired with a photo. Employers are not as heavily incentivized to upload a photo, as we did not encounter similar messaging when registering as an employer. By encouraging a profile photo from childcare workers, the platform seems to be attempting to increase feelings of trust from employers but not childcare workers.

Interrupting Coercive Flow Traps

Documenting user experience in context of not only the flow, but the larger journey.



While deceptive patterns have mostly been referred to as “pieces” or elements of an interface (e.g., a pre-checked checkbox, a hidden back button), it is also crucial *where* these elements appear on screens, within a flow. We think of ‘flow traps’ as a series of screens that users must complete (or are highly encouraged to) which have deceptive patterns within them. In effort to interrupt these flow traps, we must first identify parts of flows through the interface where users may not have the agency or full information to make decisions. In the following, we describe two parts of the registration flow that are coercive.

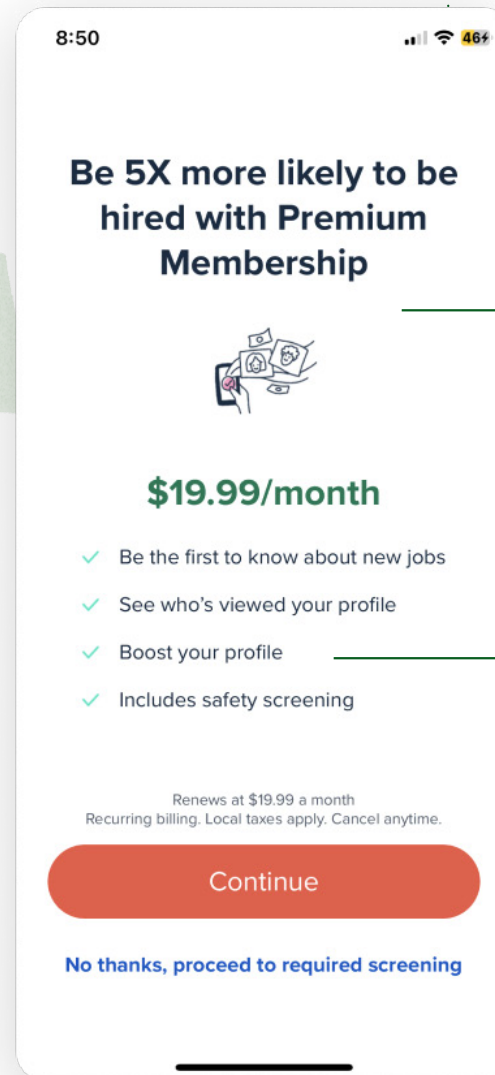
Paywalls

Childcare workers are required to pay after they have almost completed the sign-up flow (i.e., added their profile photo, pay rate, schedule availability), but before they are able to see the jobs available. The placement of this ‘paywall’ within the flow is coercive; childcare workers have already spent time and effort into creating a profile by the time they realize that they must pay to continue.

“The sign-up isn’t clear—it’s not clear that you have to pay for it until you get, like, 90% of the way through...like I had already added pictures...”—Alex, Nanny

Paywall

If childcare workers don’t opt into screening or upgrading to Premium, they are stuck—unable to go forward or backward



Childcare workers have little insight into what comes next in the registration process, specifically, the types of jobs that are available for them

Childcare workers we interviewed mentioned that the monthly fee of ~\$20 felt expensive to maintain their Premium profiles

It is unclear what “boosting” a profile looks like within the app itself, as the Childcare worker has not been able to see the matching interface yet

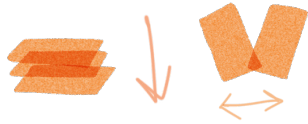
Opaque Algorithms

The paywall also includes an option to upgrade to Premium. Premium is advertised as boosting childcare workers profiles in the search rankings, but childcare workers, in our interviews, expressed uncertainty about this claim as they still felt they did not get many jobs even after they upgraded. Given the poor explainability of the ranking algorithm, it was difficult for childcare workers to make sense of where they ranked in the search results.

Fig.5: Premium Membership, Childcare Worker Registration [39]

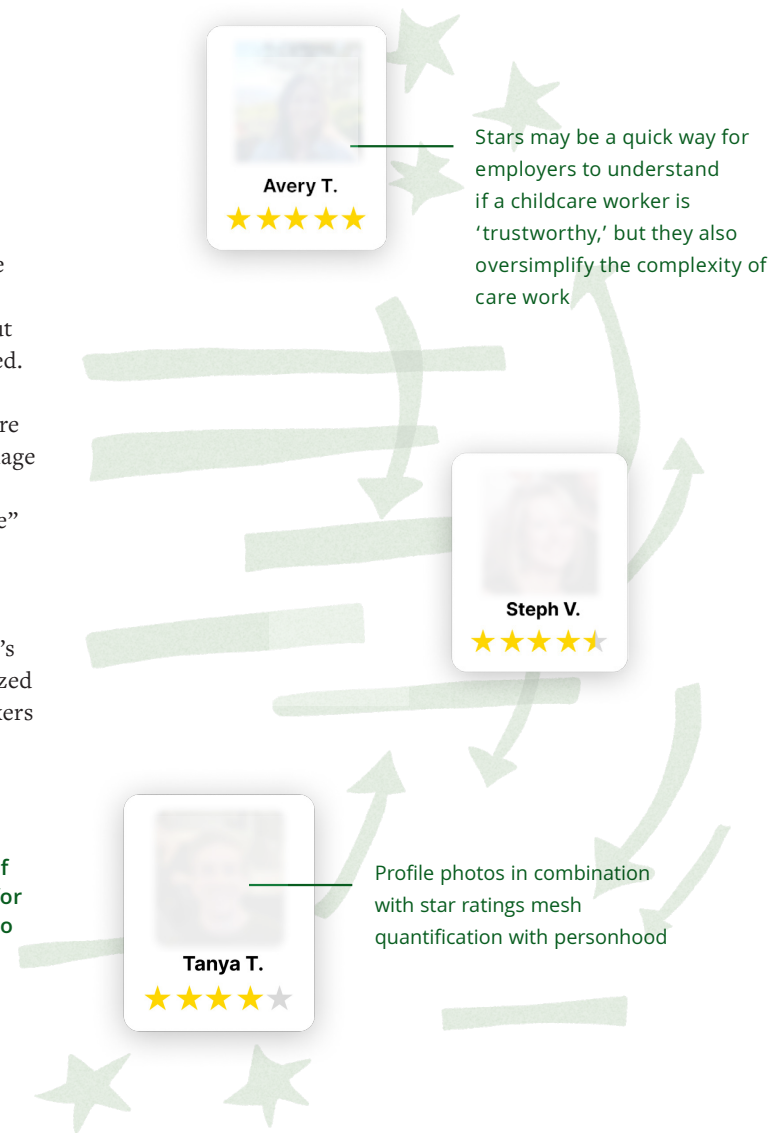
Complicating Extractive Metrics

Together, analyzing the platform vertically and side-by-side can reveal additional insights.



Childcare workers are quantified explicitly by star ratings and tracking metrics related to their response rates. Although we do not know how the ranking algorithm orders search results, childcare workers we spoke to assumed that these metrics were correlated to their search ranking, which lists “best matches” with a childcare worker’s rates and number of reviews—without any additional information about how the ranking is determined. Tracking childcare workers in these ways normalizes the surveillance of workers and extracts unpaid labor from childcare workers who put time and labor into both maintaining their image on the site (profiles, pictures, etc.) and a high response rate so that they show up in search results and can be seen as “hireable” [7,26]. Complicating extractive metrics means examining not only the metrics themselves but the ways they flatten people’s lived experiences and the ways they perpetuate existing power imbalances. In this case, the quantification of childcare worker’s labor flattens a type of work that is so intimate and individualized into a standardized system, which suggests that childcare workers can be easily compared with one another.

“I used to be ranked really high. And now I’m not even on the first or second [search results] page. And I can’t make sense of that...I’m very active. I log in a lot. I have great reviews. I pay for Premium. I’m doing all the things that Care wants you to do. So I’m like, why am I not ranked higher?”—Sam, Nanny



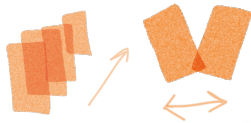
Star ratings and response rates

Employers are able to rate childcare workers, while childcare workers are not able to rate their employers, resulting in uneven accountability for childcare workers and employers. This rating system can result in childcare workers needing to be “on” at all times [28], extending time on the job to outside the confines of a workspace or traditional work hours [9]. Because employers metrics are not tracked in this way, childcare workers do not have the same access to information, possibly making it difficult for them to gauge their physical safety if they were to take the job. Furthermore, childcare workers we spoke to mentioned that they can receive ratings if they respond to even just one message from an employer—regardless of whether they were hired or interviewed. They said that if they converse with a employer, they must respond to every message or their response rate metric will go down, with one of our interview participants mentioning they felt as if they had to get the “last word” in, leading to some awkward and tiresome back and forth.

(Left) Fig.6: UI inspired by Care.com website, created by the first author to protect childcare worker confidentiality

Surfacing Unequitable Decision Capacity

By analyzing entire flows side-by-side in a multi-sided platform, we can see larger patterns of inequality.



Childcare workers' job preferences are within the childcare profile, not within registration (like employers)

7:25

< Child care profile Next

School age (6-11 years) ☐

Pre-teens and teenagers (12+ years) ☐

I'M WILLING TO HELP WITH...

Cooking/meal prep ☒

Light Housekeeping ☒

Laundry ☐

Errands/grocery shopping ☒

Carpool ☐

Crafts ☒

Swimming supervision ☐

Travel ☐

EDUCATION

Level of educ... Some graduate school ▼

School name Select

Major/area of concentration

Fig.7: Profile Options, Childcare Worker Profile [39]

Childcare workers are not specifically asked about their "ideal" employer in registration

7:03

<

Your ideal caregiver is

Nice! 150 caregivers within a mile are good matches.

Patient Energetic Loving

Reliable Caring Responsible

Tell us a little about your ideal caregiver

Next

Fig.8: Ideal Caregiver, Employer Registration [39]

Specifying Preferences

Employers are offered the opportunity to specify the qualities they desire in a childcare worker (e.g. loving, energetic) in the registration process, but childcare workers are not able to specify the qualities of an employer or family they would like to work for. Throughout our interviews, childcare workers often stressed the importance of finding employers with similar child rearing philosophies as themselves, as this is core to the work and the relationships that are built. When analyzing the platforms, we found that there are not many straightforward ways for childcare workers to specify what they desire in an employer and what their personal preferences are when it comes to child rearing. Instead, they are offered a way to specify what kind of role they would like, within their profile settings which is less up-front than the employer's process. We reiterate that choice in this context is in itself a privilege that is given to employers, and withheld from childcare workers.

"On Care.com, if your hours and your location are a good enough match that's enough...but there's so much more to it: your lifestyle and your ethics and your morals and what you believe in. I think that there's space there where families and providers could get matched in a more meaningful way than just geographically."—Avery, Nanny

Imaginary Abstracts as Synthesis

After our visual analysis, we turned to imaginary abstracts to recompose these patterns into application spaces and to explore how they might play out in near-future scenarios, with the hope that the imaginary abstracts can be used as tools for reflection on potential impacts. The process of developing and reflecting on imaginary abstracts can help researchers and designers proactively take accountability before a technology is designed (see Kozubaev et al. [15] for potential reflection prompts). The following imaginary abstracts also provide a critique of research practices; as seen in the following examples, these practices include overly focusing on positive results, and only engaging with stakeholders who have more power. These abstracts point to areas where researchers and designers can reevaluate their practices and examine how their design choices extend beyond the UI and into less visible flows and structures.

The PARENT Ranking Algorithm for Maximizing Child Safety

IMAGINARY STUDY

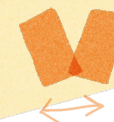
Ranking algorithms typically use the number of reviews and time to respond to rank childcare workers. However, prior work has shown that **parents feel anxiety** about using these platforms to find childcare workers who are responsible and trustworthy, especially if the childcare worker has few reviews. In this paper, we operationalize trustworthiness through a ranking algorithm for childcare online labor markets: Parent-centered Algorithmic Ranking for Evaluating Nanny Trustworthiness (PARENT). Using PARENT, we determine childcare workers' trustworthiness based on **sensors in the home, personal informatics, and social media activity**. To assess this technique, we compare perceptions of PARENT with the currently used ranking algorithm using a within-subjects experiment with 20 parents (18 mothers and two fathers), finding that all **parents unanimously preferred PARENT**.



Safety of the child and worries of the employers are prioritized, but there is no mention of the childcare worker safety



Surveilling childcare workers emphasizes the underlying algorithm and database that need to be fed highly personal data, which are irrelevant to childcare work



Highlighting the employers/parents feedback and not mentioning childcare workers, reinforces the parent-focused design and literature contributions

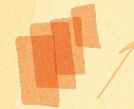
Drawing Inspiration from Dating Applications to Design an Interface for Childcare Workers

Research has shown that childcare workers prefer to be matched with families that align with their values and personalities. However, the design of matching platforms for childcare workers do not take these factors into account when ranking matches. To address this gap, we turn to the design of **dating applications** and identify design patterns that support matching users based on shared values and personalities. Drawing on these patterns, we developed a new matching application and conducted field trials with 15 childcare workers to solicit feedback on our application. In order to create accurate matches, the application requires that **before proceeding with registration**, both childcare workers and parents choose 4 words from a drop-down list of 16 choices to **specify their personal child-rearing philosophy**. As childcare workers and parents had the same list of words to choose from, sometimes the philosophies were interpreted differently (e.g. a careworker who described themselves as 'regimented' was viewed as strict, while parents who were 'regimented' were viewed as organized). The application had varied success, but will be refined in future testing.

IMAGINARY STUDY



Dating applications (like Tinder, Hinge) may attempt for two users to have mutual choice, but this abstract highlights that there are still power dynamics at play even when the interface may be 'equal'



The interface requires the 4 words before knowing how this will impact the rest of their registration or matching experience



Distilling child-rearing philosophy into 4 words is arbitrary, and may result in surface-level matching

Discussion

We have so far seen how pulling apart deceptive design elements that might seem obvious reveal multiple layers of structural inequity reanimated by UX decisions. By focusing on childcare work with the lens of radical care [13], we expose the importance of relationships which are at the heart of UX interactions and how those relationships are deeply embedded in power asymmetries that manifest in patterns. Below we reflect on the implications of our approach for design scholarship on childcare, design patterns, and imaginary abstracts.

Expanding the Deceptive Pattern with Care Layering

Throughout our visual analysis, we noted important structural inequities and asymmetries potentially perpetuated by UX design decisions. On a surface level, our Care Layering approach could signal an affective change in how we, as a community, talk about design patterns: we might shift from focusing on what not to do (e.g., not creating deceptive patterns)—towards focusing on caring about the conditions reflective of and impacted by the design work being done. The expansion of the concept of the deceptive pattern can take place vertically (examining the databases and algorithms: what is “underneath” the UX), side-by-side (comparing workers and employer) or temporally (examining the flow or journey). We view much of the framing around deceptive patterns to be reactive in part because UX designers are under pressure to move quickly and build tools—and then change them in reaction

to user feedback [24]. We would like to add to the discourse around proactive methods of identifying and addressing places where technologies contribute to inequities [6]—which means that when possible, Care Layering should be done early in the design process before deployment. However, we see Care Layering less as a toolkit and more as a series of customizable provocations that can be used with different platforms and industries.

Looking closer, we also find that this expansion resulted in a deeper shift in epistemic commitments. In the process of both creating and interpreting an expanded context, we noticed that Care Layering invites a sensitivity to questions of access, power, and knowledge. Does a particular UX decision affect whose access comes to matter? Does it shape what information is known and to whom? Does it shape how power gets distributed, challenged, or maintained? And conversely, how does power shape UX patterns? With these questions, the layering opens analytic sight lines otherwise under-acknowledged by the design process. We see the creation and examination of imaginary abstracts as complementary to Care Layering because they help us to move beyond imagining how we might avoid deceptive patterns to critically reinterpreting how patterns are created, deployed, and used in wider systems, including academia and industry.

Limits of Care Layering

We faced several logistical challenges when conducting our visual analysis of the childcare work platform Care.

For one, we were required to input a social security number and consent to a background check for our account to be created, which put members of our research team in a vulnerable position. We similarly felt at risk when creating accounts with our personal or institutional email addresses. We put text in our profiles to make it transparent that we were researchers and not care workers, which we suspect ultimately led to our account being removed—however, the platform did not provide us with a reason for the suspension. When taking screenshots of the platform, we had to be careful that we did not include any unobfuscated personal information (e.g., photos) of other users.

Bringing these concerns to the Care Layering process, we wondered whether there were layers we didn't see? Or layers we couldn't access? We had an intuition for how the algorithm works, but we did not know for sure. There are circumstances in which researchers will not have access to, or have insight into, algorithmic technicalities which shape the nature of the analysis. We ask—how does the knowability of 'the algorithm' impact the depth of analysis? To what extent does knowability matter when examining discursive aspects of interface design (e.g., the elements are shown to be important)? Furthermore, the patterns and layering that we identified were from one part of one platform, and we foresee that others will be uncovered in research of different platforms. When we start to put these additional present and absent layers into context, we begin to identify

their implications based on what we know of the interface and participants' perspectives. Together these challenges led to important questions around the limits of Care Layering and to what extent design researchers might need to pause, step back, or introduce forms of self-care.

Adaptive Imaginary Abstracts

Our approach uses imaginary abstracts as an additional Care Layer, a process that broadens and reworks how we build accountability into design pattern tools. This version of adaptive imaginary abstracts shifts the focus of the abstract itself. Rather than orient the fictional study design toward the process of prototyping, we emphasize the work of accountability. Taken in context, our visual analysis decomposes an interface while the imaginary abstracts work to reconstruct it, reframing it in an academic research context. The process of reconstruction can help researchers reflect on the through line between academic research and commercial applications. Through Care Layering, imaginary abstracts show how design patterns relate to one another and create compounded effects—exposing patterns as part of larger ecosystems of research and design. They can illustrate how design patterns circulate through these larger ecosystems, are adapted over time and show how patterns from commercial products and from academic research persist, or are perpetuated, from one context to the other. Furthermore, they can help us to reflect on current and future impacts—part of the necessary work of taking accountability.

Conclusion

This pictorial introduces Care Layering as a technique for complicating and contextualizing deceptive patterns by integrating an analysis of their wider conditions of development and use, including the positionality of the users and their relationships to each other. We illustrate how taking apart and decomposing UX patterns can help design scholars make sense of the embedded decisions and reimagined possibilities tied to platform design.

Acknowledgements

We thank our participants who offered their important and vulnerable experiences, and our board members who continue to provide us guidance. This work was funded by the National Science Foundation (grant #2222242).

References

- [1] Christopher Alexander. 1977. *A Pattern Language: Towns, Buildings, Construction*. Oxford University Press.
- [2] Ruha Benjamin. 2019. *Race after technology: abolitionist tools for the new Jim code*. Polity, Medford, MA.
- [3] Rena Bivens and Oliver L. Haimson. 2016. Baking Gender Into Social Media Design: How Platforms Shape Categories for Users and Advertisers. *Social Media + Society* 2, 4. <https://doi.org/10.1177/2056305116672486>
- [4] Mark Blythe. 2014. Research through design fiction: narrative in real and imaginary abstracts. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*, 703–712. <https://doi.org/10.1145/2556288.2557098>
- [5] Elly Cosgrove. 2019. Care.com shares surge after Barry Diller's IAC agrees to buy online caregiver marketplace. CNBC. Retrieved January 27, 2024 from <https://www.cnbc.com/2019/12/20/iac-to-acquire-carecom-in-500-million-deal.html>
- [6] Sasha Costanza-Chock. 2020. *Design justice: community-led practices to build the worlds we need*. The MIT Press, Cambridge, MA London.
- [7] Elizabeth Fetterolf. 2022. It's Crowded at the Bottom: Trust, Visibility, and Search Algorithms on Care.com. *Journal of Digital Social Research*: 49–72. <https://doi.org/10.33621/jdsr.v4i1.98>
- [8] Casey Fiesler, Nathan Beard, and Brian C. Keegan. 2020. No Robots, Spiders, or Scrapers: Legal and Ethical Regulation of Data Collection Methods in Social Media Terms of Service. *Proceedings of the International AAAI Conference on Web and Social Media* 14: 187–196. <https://doi.org/10.1609/icwsm.v14i1.7290>
- [9] Frances Flanagan. 2019. Theorising the gig economy and home-based service work. *Journal of Industrial Relations* 61, 1: 57–78. <https://doi.org/10.1177/0022185618800518>
- [10] Mafalda Gamboa, Sara Ljungblad, and Miriam Sturdee. 2023. Conversational Composites: A Method for Illustration Layering. In *Proceedings of the Seventeenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '23)*, 1–13. <https://doi.org/10.1145/3569009.3572793>
- [11] Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin L. Toombs. 2018. The Dark (Patterns) Side of UX Design. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–14. <https://doi.org/10.1145/3173574.3174108>
- [12] Mary L. Gray and Siddharth Suri. 2019. *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass*. Houghton Mifflin Harcourt.
- [13] Hi'ilei Julia Kawehipuaakahaopulani Hobart and Tamara Kneese. 2020. Radical Care: Survival Strategies for Uncertain Times. *Social Text* 38, 1 (142): 1–16. <https://doi.org/10.1215/01642472-7971067>
- [14] Mohammad Hossein Jarrahi, Will Sutherland, Sarah Beth Nelson, and Steve Sawyer. 2020. Platformic Management, Boundary Resources for Gig Work, and Worker Autonomy. *Computer Supported Cooperative Work (CSCW)* 29, 1: 153–189. <https://doi.org/10.1007/s10606-019-09368-7>
- [15] Sandjar Kozubae, Chris Elsdén, Noura Howell, Marie Louise Juul Søndergaard, Nick Merrill, Britta Schulte, and Richmond Y. Wong. 2020. Expanding Modes of Reflection in Design Futuring. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)*, 1–15. <https://doi.org/10.1145/3313831.3376526>
- [16] Caitlin Lustig, Maya A Kaneko, Meghna Gupta, Kavita Dattani, Audrey Desjardins, and Daniela Rosner. 2024. Porous by Design: How Childcare Platforms Impact Worker Personhood, Safety, and Connection. In *Designing Interactive Systems Conference (DIS '24)*, July 1–5, 2024, IT University of Copenhagen, Denmark. ACM, New York, NY, USA, 15 pages. <https://doi.org/10.1145/3643834.3661552>
- [17] Caitlin Lustig, Sean Rintel, Liane Scult, and Siddharth Suri. 2020. Stuck in the middle with you: The Transaction Costs of Corporate Employees Hiring Freelancers. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW1: 37:1–37:28. <https://doi.org/10.1145/3392842>
- [18] Paula McDonald, Penny Williams, and Robyn Mayes. 2021. Means of Control in the Organization of Digitally Intermediated Care Work. *Work, Employment and Society* 35, 5: 872–890. <https://doi.org/10.1177/0950017020969107>
- [19] Michelle Murphy. 2015. Unsettling care: Troubling transnational itineraries of care in feminist health practices. *Social Studies of Science* 45, 5: 717–737. <https://doi.org/10.1177/0306312715589136>
- [20] Safiya Umoja Noble. 2018. *Algorithms of oppression: how search engines reinforce racism*. New York university press, New York.
- [21] Ikechukwu Obi, Colin M. Gray, Shruthi Sai Chivukula, Ja-Nae Duane, Janna Johns, Matthew Will, Ziqing Li, and Thomas Carlock. 2022. Let's Talk About Socio-Technical Angst: Tracing the History and Evolution of Dark Patterns on Twitter from 2010–2021. Retrieved October 26, 2023 from <http://arxiv.org/abs/2207.10563>
- [22] Sarah T. Roberts. 2019. *Behind the screen: content moderation in the shadows of social media*. Yale University Press, New Haven.
- [23] Joseph S. Schafer, Kate Starbird, and Daniela K. Rosner. 2023. Participatory Design and Power in Misinformation, Disinformation, and Online Hate Research. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference (DIS '23)*, 1724–1739. <https://doi.org/10.1145/3563657.3596119>
- [24] Jared M. Spool. 2019. Proactive UX Design: A Big Leap Requiring Baby Steps. *Medium*. Retrieved February 4, 2024 from <https://jmspool.medium.com/proactive-ux-design-a-big-leap-requiring-baby-steps-e131911a1609>
- [25] Julia Ticona and M. Ryan Tsapatsaris. 2023. Worker Resistance in Digital Capitalism| Platform Counterpublics: Networked Gossip

and Resistance Beyond Platforms. *International Journal of Communication* 17, 0: 21.

[26] Julia Ticona. 2022. Red flags, sob stories, and scams: The contested meaning of governance on carework labor platforms. *New Media & Society* 24, 7: 1548–1566. <https://doi.org/10.1177/14614448221099233>

[27] Julia Ticona. 2020. Essential and Untrusted. *Dissent* 67, 13–18.

[28] Julia Ticona and Alexandra Mateescu. 2018. Trusted strangers: Carework platforms' cultural entrepreneurship in the on-demand economy. *New Media & Society* 20, 11: 4384–4404. <https://doi.org/10.1177/1461444818773727>

[29] Raphael Velt, Steve Benford, and Stuart Reeves. 2020. Translations and Boundaries in the Gap Between HCI Theory and Design Practice. *ACM Transactions on Computer-Human Interaction* 27, 4: 29:1–29:28. <https://doi.org/10.1145/3386247>

[30] Calvin Warren. 2016. Black Care. *liquid blackness* 3, 6: 36.

[31] Kelly Widdicks, Daniel Pargman, and Staffan Bjork. 2020. Backfiring and favouring: how design processes in HCI lead to anti-patterns and repentant designers. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (NordiCHI '20)*, 1–12. <https://doi.org/10.1145/3419249.3420175>

[32] 2019. IAC Announces Agreement to Acquire Care.com. IAC. Retrieved January 27, 2024 from <https://www.iac.com/press-releases/iac->

[announces-agreement-to-acquire-care-com](https://www.iac.com/press-releases/iac-announces-agreement-to-acquire-care-com)

[33] The care economy. *International Labour Organization*. Retrieved January 8, 2024 from <https://www.ilo.org/global/topics/care-economy/lang--en/index.htm>

[34] Insights into the \$648B Market Opportunity in the Care Economy. *Invest in Care*. Retrieved January 8, 2024 from <https://www.investin.care/>

[35] What are User Interface (UI) Design Patterns? *The Interaction Design Foundation*. Retrieved February 4, 2024 from <https://www.interaction-design.org/literature/topics/ui-design-patterns>

[36] Deceptive Patterns - Home. Retrieved January 27, 2024 from <https://www.deceptive.design/>

[37] About Us - Care.com. Care.com. Retrieved January 27, 2024 from <https://www.care.com/en-nz/about-us>

[38] Care.com Privacy Policy. Care.com Corporate. Retrieved February 7, 2024 from <https://www.care.com/about/privacy-policy/>

[39] ©Care.com. 2023. Care.com: Hire Caregivers (Version 20.23.1) [Mobile App]. Apple iOS App Store.