Games Crafters Play

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ABSTRACT

In this paper, we seek to extend the definition and scope of discourse surrounding creative games and play by looking outside the communities traditionally represented in the conception of "gamer" and game studies. Through an examination of games popular in craft communities, particularly that of the textile craft spaces dominated by women, we propose a new model for merging craft play with existing representations and understanding of "craft" and craft systems as a part of gaming. Drawing upon the community-oriented, challenge-centered models we discuss in this paper, we offer potential avenues for game designers to pursue inclusive, feminist design and rethinking creative modalities of play.

CCS CONCEPTS

• Applied computing~Computer games

KEYWORDS

Craft games, computational craft, games, diversity in games

1 INTRODUCTION

The games we play, teach, and even allow to be defined as a "game" are reflective of who we are, what we value, and how we think. Fron et al. warn of the "hegemony" of play, in which we allow dominant power structures to determine what games are worthy of study, play, and writing [16]. The games research community has collaboratively determined norms for games; though we may disagree on definitions, most game scholars focus their work – regardless of their home discipline(s) – on games that we have come to consensus on "counting": video games, computer games, mobile games, so-called "casual" games, and board games played in gaming communities. As in all scholarly fields of inquiry, it is necessary for us as game scholars to draw boundaries around what games "count" in order to build and share common vocabularies, solve technical research problems, and define a tractable scope for analysis.

In this paper, we examine a set of physical games that fall outside this realm of games that we typically study. In keeping with this year's conference theme of centering the "player" through designing from and for them, we focus on games played in a specific community that has significantly different demographics from gaming communities: that of hobbyist fiber artists. Quilting, knitting, crochet, and embroidery are crafts that are typically practiced by women of all ages (in the Western world) and often passed down in families from grandmother to mother to daughter.

Fiber crafts are frequently centered in social spaces dominated by women and communities. It is common for crafters to join together for large group projects, or to socialize with each other as they work on individual projects. This social circulation remediates and extends existing traditions and communities, frequently established as organizations integrated with and serving their communities. The intervention of technological platforms has extended the reach of these communities, as explored by Jennifer Russum [30] who looks further at the "quilts for a cause" movement of women's sewing activism and situates it in the history of social sewing in America as remediated through social media.

Women continue to be the most visible crafters within these communities, as textile arts are predominantly marketed to girls and practiced at the hobbyist level by women. Culturally -- especially in the United States -- play is seen as something that is gendered, both in games and toys. While there has been recent work to shift this perspective, video games are still often considered a male-dominated domain. While children's crafts and video games may occupy the same spaces (like the soon-vanishing Toys R Us), domestic and fashion-coded toys (including textiles) are relegated to "pink" aisles and the two spaces are physically separated [5]. An interest in the making of perceived fashion accessories through a craft such as knitting is thus conventionally coded very differently from an interest in games.

Products and marketing rarely bridge these two category spaces and the correspondingly gendered assumptions of their dominant (and thus default) markets. In her examination of the gendering of games, Shira Chess notes the anomaly of the Nintendo Knitting Machine (demoed but never released to American audiences in the 1980s) as an anomaly for its time: a rare moment when the early games industry looked to craft but ultimately abandoned that audience, a gendered player group that Chess categorizes as "Player Two" for their status as "other" from the young male default of gamer identity [12].

However, looking more closely at those who engage in textile-based crafts, we found that crafters design and play a wide range and number of their own gaming activities within their own communities and involving the crafts they are creating. These physical games that generally end with a crafted product are popular ways to build community and are often digitally mediated, relying on social media and other community-based websites to bring players together even if they are from different geographic locations. These games do not always present the interfaces or mechanics one might typically think of a game, but they share characteristics that make them useful and important to study.

There are a number of reasons that crafters may participate in these gaming activities. These reasons may include, but are not limited to: meeting new people, strengthening community, posing creative challenges, and adding an element of unknown or playfulness to a task. Like many games, these craft games may engage with more than one of these reasons simultaneously.

We are presenting craft games because studying the purpose of these games as well as why crafters play them lead to insights that can be incorporated into video games to broaden the appeal to a more diverse population. Given the discourse of women, non-binary, and other gender-marginalized gamers as outsiders, taking a closer look at the way play is valued and highlighted in these communities offers an opportunity to rethink the approach of "pink box" game design still deeply embedded in many games, particularly casual titles [12][20].

In this paper, we contribute an analysis of the games that crafters design and play, highlighting themes related to the values of the community these games are born to, and the materiality inherent in this domain. Additionally, we discuss a space of games that is currently under-explored in the digital games community and serving a demographic that is currently underserved by video games. Through our exploration and analysis, we can engage in exploring possible futures of digital games informed by craft games.

2 BACKGROUND

Representations of crafting are common in games [18], but most of this crafting is superficial when compared to the tradition and depth of real life crafts. Such play often treats the act of making primarily through the lens of combinatorial labor, emphasizing gathering and producing but eliminating any nuance from the "middle stage" of the process. These models are reductive: they suggest an ultimate goal of sameness in the results, due in part

to the limitations of utility under which most game crafting systems operate [2].

Given this conflation of crafting with combinatorial labor in much of game space, it is important to clarify our definition of craft, which is as contested a term in spaces of art and consumer discourse as games. In the discourse of consumption, Campbell suggests that craft as a market category can be understood as something "made and designed by the same person," and thus distinct from personalizing or customizing an object primarily made by someone else[10]. Often this type of designation is used to mark a product as part of a gendered pattern of consumption, associated with marketplaces outside of more industrial models. However, as a distinction it is significant for us because it emphasizes multiple spaces for play: in the design, and in the making, which may occur in stages or simultaneously depending on the craft.

Similarly, game is a contested term which may not be readily applied even by participants to all the types of play we are examining here, perhaps in part thanks to the gendering of games and games discourse. Applying the term game externally may seem inappropriate, particularly given the lack of visible markers (such as "winners") in most of these exemplars. However, we build here on the tradition of Arjoranta [6], who suggests that our approach to game definitions should be informed by our lens and subject to evolve outside of essentialism. We seek here to expand the lens of game studies, and indeed the operational space of games, not to impose arbitrary limitations or rulesets on external communities of play.

3 METHODS

To find the list of games that we surveyed, we began with our own domain expertise to create an initial list of the types of experiences that fit our definition of games. We chose to focus on the textiles domain for three reasons. The first is that the demographic is predominantly female, which gives us a different perspective from the (stereo)typical video game demographic. The second is that textile-based crafts are not studio-based crafts, so they tend to have a strong social community surrounding them as the projects often have some portability. This means that there are more social gatherings and therefore more game playing opportunities. Finally, this work draws on the traditions of auto-ethnography, particularly from the context of fan studies: the authors of this paper are participants in textile and fiber communities and play, and in some cases also operate as facilitators and makers of these types of experiences. We believe this participant methodology is important here because we have experienced these games as crafters and players.

We used the initial list to inform the rest of our information gathering. We polled participants in the quilting, knitting, and crochet communities for suggestions, focusing on these communities as they have a large online presence. We also searched Ravelry [41] and Craftsy [42], two commonly used craft pattern sites used by textile crafters. And finally, we googled for the following key phrases: quilt games, knitting games, crochet games, craft games, embroidery games, sewing games. From the

compiled list of games, we grouped the games around the type of challenge that they present.

4 GAMES CRAFTERS PLAY

There are a wide variety of games that crafters play, most of them social in nature. The rules of these games are generally more flexible than in a standard video or board game with each facilitator creating their own variation, and they may go by many names. Below is a list of the craft game genres as well as a description of what games in each genre entail.

4.1 Craft Game Genres

4.1.1   Progressive Crafts. These are games in which one person starts the craft, and the next person continues it, which generally involves 2-12 people. In many ways, it is the "exquisite corpse" [21] of crafts. There are a number of variations on this type of game which sometimes have a specific name based on the rules of how the craft is continued by each person, and whether they are being created while everyone is in the same location or not.

4.1.2   Bees. These are games in which groups of people work together to simultaneously create individual crafts with everyone crafting parts for each of the other participant's projects. The collected parts are incorporated by each person into their final project. Bees typically run for a full year. The standard way this is run is that each person becomes the "Queen" for a month (or some other predetermined amount of time) and they specify what they want from everyone else. This changes as the game progresses so everyone participating has a chance to be the Queen. There are many variations on this, generally around the amount of constraints people will specify each month. For instance, one style has the Queen picking a specific quilt block style and colors, and the participants use their own fabrics to try to match the colors and make that block. Another variation has everyone being Queen at the same time (with a smaller group) and each person specifies a set of colors, and all the other participants make the same block for each person in the colors they specified. This type of swap generally happens 3-4 times during the year.

4.1.3   Craft-a-longs. These games are generally moderated by one or two people, in which a pattern is picked and as many people that want may participate. Play is broken up into discrete steps that work through the pattern with a set amount of time for each step. Participants are not held to the time limit, but each step is posted at a specified time, and there is a feeling of "being with the group" that can be lost if a participant falls behind. Participants have creative control over their final product, often choosing colors/fabrics and modifying the pattern as they go to fit their needs. There is a strong commitment to sharing the work as things progress, and at the end everyone shares their version of the project.

4.1.4   Mystery Craft-a-longs. A variation on the above theme, but the final pattern isn't known by the players. Each step of the project is called a "clue" and often the clues are ordered in a way to hide as much about the final product as possible. There is even

more pressure to not fall behind, as "spoilers" are often posted as people finish each clue. Some of these games also include narratives that follow mystery or murder mystery tropes. Another variation on this is that the pattern itself has multiple possibilities that are determined by either player choice (Choose Your Own Adventure style) or through dice rolling (Role-Playing Game style).

4.1.5   Swaps. These are games in which players make something for someone else. There are many variations on this theme in which each participant may or may not know who they are making something for, they may or may not know who is making them something, they may or may not have input into what they get, and the participants may or may not be making the same thing for each other. One or more things is always hidden however, and almost all variations include a final reveal where any unknown information is shared. For instance, a common variation is to have the participants know who they are making something for, and each player specifies colors and information about what they want to receive. However, participants do not know who is making something for them and as things are being made and shown, they don't know which item they will receive. At the end, each item is given to the recipient and the maker is revealed.

4.1.6   Races. These are games in which there is a time challenge involved with making the craft by either racing other players or racing the clock. Often the different variations of these games have different names based on either the process or the product. For instance, "jelly roll races" use "jelly rolls" of pre-cut fabric and "sheep to sweater races" involve the process of starting from a sheep and ending with a sweater. We talk more about both of these games in section 5.2.1. Like other races, the first person who finishes "wins".

4.1.7   Creativity Challenges. These are games that challenge the players to create something with some constraint that they must work around. Variations are built around the different types of constraints. For instance, each participant may be working around incorporating the same color into their project, using a specific fabric or yarn, incorporating a specific shape, or working from a piece of artwork or photograph. Some of these games require each player to use the same constraint (e.g. they are all working with the same color), while some have each player specify their chosen constraint within the rules of the game (e.g. each player chooses a different photograph to work from).

5 GAME CHALLENGE CATEGORIES

While the different genres of craft games are useful for identifying groups of games, it is also important to focus on the types of challenges these game genres present as a lens towards why crafters play them. Some of the games fit into multiple categories as they contain challenges on more than one dimension, however we discuss the genre in its primary challenge category. The three types of challenges we identified are:

1. Collective creativity - designing and/or making things together.
2. Constraint challenges - working around constraints in design, materials, or process.
3. Hidden information - working without knowing the full specification, with the information being revealed as the player proceeds or at the end.

5.1 Collective Creativity Challenge

The collective creativity challenge includes games in which the primary challenge is creating something while creating within someone else's design aesthetic or towards someone else's design goals. All games that fit into this category are multiplayer games with asymmetric play (one or more players set the goals while the other players work to meet them.) The general variations of this category are games in which the players are working on the same physical project, working on separate instances of a project together, and working on a project for other players.

5.1.1 Working on the same physical object. Collective creativity games in which the players are working on the same physical object are by necessity turn-taking games. Each player adds to a project one-at-a-time and in many of these games, each player has only one turn. All games in this category have creative goals set by someone other than the player. The challenge comes in how each player creates to achieve those goals. It is common for these games to incorporate enough turns or game instances such that each player has a turn defining the design goals.

All progressive craft variants fit into this subset of collective creativity. Since each player has only a single turn and the turns can be as long as 4-6 weeks (or more), it is common for multiple instances of the game to be played simultaneously by the same player base. Each player will start a project, defining initial constraints such as colors, theme, or inspiration. The projects will rotate through each of the players, with each player focusing on a single project for the allotted time for the turn. This is the only time they will contribute to a project—when the turn is over, they will receive another project to focus on. This continues until every player has contributed to every project. The person who started the project will get it back in the end, and they are in control of the finished project.

The challenge with progressive crafts is working within the constraints of the person who started the project, but also in incorporating the design and aesthetic of the players whose turn came before. Often each player has distinct tastes and creating to someone else's specifications often pushes players out of their creative comfort zone, forcing them to engage with different techniques or design styles than they would normally use.

Similarly, Bees also fall in the collective creativity challenge category. The Queen Bee for the month decides the aesthetic goals that each player is working towards. Therefore, the players must work to create a project that fits within the aesthetic constraints detailed by the Queen. Each turn has a different Queen, with a small project being produced by each player at the end of the turn.

5.1.2 Working on separate projects, together. Another subset of the collective creativity challenge are games in which the players work on separate instances of the same project together. Players work on a single project for the entirety of the game, and therefore turn-taking is not necessary. However, like all games in the collective creativity category, there is asymmetric play in which one player is setting the creative goals for the other players.

Craft-a-long games are in this subset of collective creativity. A facilitator runs the game, choosing the pattern that everyone will be following. The project is broken up into a series of steps and the players follow along with each step, often sharing their progress on social media and other communities. While the pattern is set, players have control over colors, layout, and how closely they follow the chosen pattern. Unlike the variant of collective creativity in which players are working on the same project together and the facilitator is in control of the final project, players only work on their own project and therefore are in control of the finished project. This gives them latitude in making changes to the pattern as they see fit.

Mystery craft-a-longs are similar to craft-a-longs except that the final pattern is known to only the facilitator. Each step is shared as a "clue" with the final pattern being revealed only at the end. This means that players are less likely to make changes to the pattern as they are unable to strategize and plan ahead to do so. We will discuss this more in the hidden information category.

5.1.3 Working on projects for other people, separately. The last subset of collective creativity challenge are games in which the players are making separate projects specifically for someone else. These projects may be for the same person, or more often there is a 1-to-1 mapping between projects and recipients. The challenge comes from creating a project based on cues received from the recipient.

Swaps are the main genre that fits into this category. Swaps are generally focused on creating a project for a partner. Here, the facilitator role involves facilitating the game (much like a GM) instead of the facilitating the design goals. In swaps in which the recipient is known, the recipient often provides information about likes and dislikes, as well as illustrative photographs of things they like. Often swaps are themed: fandom swaps, for instance, invite participants with a shared love of a media franchise to participate, which becomes one of the guiding constraints of all the produced crafts.

While swaps long predate social media (and swaps do not necessarily require social media), often the "play" of a swap occurs through meeting set check-in dates with visible postings within a hashtag on a shared platform such as Instagram. In a mystery swap, this encourages play on both sides of the exchange – the recipient may try to "guess" what is being made for them, while the maker posts clues and even questions seeking collective guidance on the design as it progresses. While not all swaps use the mystery format, most rely on this type of secrecy (akin to the "Secret Santa" tradition) to promote community and engagement with the rest of the participants throughout the swaps.

Other play in this genre builds on traditions of charity and giving which are deeply entwined with the history of crafting. Frequently, calls are posted for charity quilts with contribution rules that follow certain constraints. For instance, following the Pulse nightclub shooting, members of the Orlando Modern Quilt Guild solicited blocks and tops using hearts and rainbow colors to make quilts for victims, survivors, emergency responders, and other impacted members within the community. Crafters from around the world responded with everything from complete quilts to bags of blocks generally following these constraints, which in turn were assembled piecemeal by members of the guild. The quilts were then donated to those who were affected by the Pulse tragedy. While many of the craft games focus on a sense of community, this type of game emphasizes this aspect of crafting beyond their own community.

5.2 Constraint Challenges

The constraint challenge in games is the creative challenge of working around self- or externally-imposed constraints on the design or creation of a project. Such games recall the "writing under constraint" operations of Ouilpian avant garde writing exercises [36], and similarly play with the intersection of craft and mathematics, which is particularly visible in fiber arts. Constraints are a common theme in video games, with time and resource constraints being a standard way to introduce challenge into a game.

The games that fit into this category are games in which one or more participants play competitively towards a single goal or cooperatively towards different goals, to create a specified project working around a specified constraint. The general variations of this category revolve around the type of constraint: time constraints, design constraints, or resource constraints.

5.2.1 Time Constraint Games. Time constraint games are one of the only explicitly competitive games that we found in our survey. In these games, the players are competing against each other to complete a project with specific starting and ending conditions to see who can finish first. Since crafting is often more about the deliberation and care that goes into a project, there are limited examples of these types of racing games. Three specific examples are "Sheep to Sweater" style races, "Jelly Roll Races," and hosted competitions such as "Row by Row."

In Sheep to Sweater style races, teams of people compete, starting with a sheep that follows strict rules about the type of sheep and the care of the sheep beforehand to make sure there is an even playing field. From there the teams work through the entire process of shearing the sheep, cleaning the wool, carding and spinning the wool into yarn, and knitting a specified sweater. These are endurance style races as this process can take anywhere from 5-16 hours, or more.

Jelly Roll races similarly begin with specific materials: a pattern and a "jelly roll" – which is typically 40 strips of fabric that are generally 2.5" wide x 44" long. In this type of race, the players compete individually to create a completed quilt top first. These are quicker races than the Sheep to Sweater style, as they generally last no more than an hour or two.

Hosted competitions such as "Row by Row" are an annual event featuring themed patterns produced by local quilt shops around the US, Canada, and some parts of Europe. With these types of races, players visit different shops, receiving a pattern for a "row" unique to that shop. The first participant that returns to a shop with a completed quilt using at least eight different rows from the event wins a reward. This type of race encourages speedy consumption, making, and "shop hop" style collaborative drives and organized gathering of patterns from event-affiliated shops. Row by Row races resemble the type of gamified incentives structures of other consumer models but with a greater emphasis on making.

While the goal of time constraint games is to be first, the true challenge lies in analyzing, strategizing, and optimizing individual and team processes. These optimizations must also make sure that the quality of the finished product is not negatively affected, as falling below a certain level of quality will either cause the contestant to be disqualified or require them to start again.

5.2.2 Design Constraint Games. Unlike the process-focused time constraint games, design constraint games instead challenge the player's design acumen, requiring players to design and create around specific constraints. It is worth noting that this is a sub-genre of Constraint Challenge games that is not currently widely represented (if at all) within video games. Design constraint games are a reflection of the value of the design process in crafting, which is often overlooked when work is viewed externally as following familiar patterns or formulas. The recipe-based crafting systems of games certainly encourage this view, as does the dismissive lens through which "craft" is placed alongside art.

Design constraint games use design elements that are common within textile crafts. For instance, color challenge-based games center around the palette, and frequently place restrictions that provide crafters with a mechanism for exploring spaces or colors outside of their usual comfort zone. In the Quilt Design a Day community [43], a designated member will post a daily color palette for the rest of the community to use in their design for that day. While not all of the ensuing designs are used for quilts, the experimentation in the design phase encourages both color play and communal learning, as resulting designs are shared and discussed. Given the investment of quilting and other fiber crafts at a large scale, color challenges will frequently focus on the design stage (working in Illustrator, Electric Quilt, or other digital tools, or on paper through coloring templates) or mini quilts, encouraging experimentation that would be riskier within a larger project.

Similarly, shape challenges might center a particular block or form (such as flying geese, a popular simple block) or a basic geometric shape, challenging participants to come up with a new or expressive way to engage with that familiar shape through play with color, scale, and intersections. Other challenges draw on external inspirations, and may be personal, such as challenges wherein one (or many) quilters reimagining a piece of art through their medium. This sets limitations on color, theme, and imagery to be maintained for the final result to be recognizable.

While these types of design challenges may sound fairly constrained, not all design challenges operate within the same fixed set of rules. Some focus instead on the outcome, or object, of the craft: for instance, a group might all produce mini-quilts of a fixed size (such as the postcard quilt, a popular format for expressing local or landscape themed designs) and work expressively within the constraints of scale or form.

5.2.3 Resource Constraint Games. These types of games are those in which the challenge of the game revolves around limited or specified resources. Frequently, resource constraint games are corporate sponsored: fabric challenges at quilt shows, for instance, require quilters to feature a particular fabric line that significantly impacts the design process. These games often come with prize incentives in the form of a juried exhibition or contest resulting from the play, and part of the joy of these exhibitions is in the inventiveness: a crafter determined to produce a modern quilt but working with a line of florals, for instance, may substantially rethink or cut the material to change the perception of the original pattern, while other quilters will let the fabric guide the design practice.

Resource constraint games can also emerge from practical problems: fiber artists typically produce large amounts of scraps in various colors, sizes, and shapes depending on their medium, and given the cost of materials and the value crafting communities often place on minimizing waste, resource constrained games are a way to address that need. Quilts in the "scrap bag" or "sew your stash" tradition often emerge from a shared desire to use up that collected material and will usually involve suggestions or a scrap-accessible block.

The resource constraint approach encourages inventiveness with fabrics, as the goal is to resist buying new fabric to fill any particular design vision. Organized "scrap alongs" or guild challenges provide a space to share frustrations and challenges while solving the particular problems presented by one's own available materials.

This practice is also deeply historicized in quilting, where patchwork itself reflects a desire to optimize the utility of fabric over its lifetime and has even been the subject of play in a board game entitled Patchwork [23]. In Patchwork, two players work separately to fill a 9x9 grid by strategically selecting options from the next available oddly-shaped scraps, which is not unlike the process of fitting together scraps materially in quilt alongs of this kind.

Games also emerge as a way to examine the material practices of crafting, particularly in terms of the physical constraints of the work versus a crafter's goals or efficiency. One such popular shorthand is "yarn chicken," which refers to the practice of attempting to finish a knitting or crochet project before the player runs out of yarn. When shared on social media, such play becomes both a source of community and humor and a way to make visible the discrepancy between "best practices" and realities of crafting.

5.3 Hidden Information

While many of the types of craft games we've discussed are centered on the practice of craft itself, altering the act of design,

making, or sharing through play and the addition of rules-based systems, some craft games go further in incorporating elements from other genres. These games offer a hybrid experience, often bringing in a stronger sense of narrative or progression.

Explicitly narrative craft games, such as "craft-a-longs" themed around murder mysteries or role-playing games, use different structures to release patterns alongside narrative. For example, the Murder-Mystery-Quilt [44] is a recurring year-long event with a monthly release of book chapters and quilt blocks. The quilt blocks, when assembled, help "reveal" the murderer: participants gather in forums to guess at the murderer, as well as share their versions of the month's block. The relationship between quilt pattern and narrative is not always clear, and the narrative is not explicitly quilt-focused. For instance, in the 2018 iteration of the Murder-Mystery-Quilt, the narrative is set around a murder at an archaeological excavation at Jamestown.

One thing to note is the instructional aspect of the pattern: in this type of quilt-a-long, access to a community for support in the learning process is part of the advertised value. This is not unlike other educational or serious games, where the narrative and actions of play are not necessarily meaningfully connected, but together they have the potential to provide structures for motivation and support.

Other exemplars of this hybridity more directly tie play to craft: in the Adventure Knitting: A Day in the Woods [24] book by knitter Lee Meredith, each path chosen by the player is recorded through a corresponding stitch that gradually builds out into any one of a number of objects depending on the choices made. The series features a retro aesthetic that recalls the classic Choose Your Own Adventure books, directly connecting craft play to nostalgia gaming. Similarly, the knitting RPG, Yarn Quest 2017 - Heroes of Yarnia [45], provides a role-playing framework around a knit-a-long, with players using dice to roll their knitting-based characters, explore, and fight enemies. Each die roll is matched to a table of partial patterns, such that when the final project is knit, each player will have a different combination of pattern parts combined for the final project.

6 DISCUSSION

The dialogue between craft and games is well established, but superficial in the context of games and game studies. While crafting communities are building creative value and challenging design paradigms and practices through play, game design has not similarly drawn upon these practices and possibilities. In this section, we touch on the existing representations of craft in game design and suggest ways in which game design practices and communities might benefit from a greater engagement with the practices modeled here. This is merely an overview of these topics; there is room for each of these to be studied on their own in future work.

6.1 Craft Games and Video Game Crafting Systems

Video games have included craft systems for decades. While there is a great variety of crafting systems in games [18], most craft systems do not engage with the same values or priorities as real-life crafting. Many video game crafting systems are instead viewed through an economic lens, as they work to establish scarcity and a reason for player interaction and trade, potentially translating into ramifications for community building [22].

The engagement with crafting in games is often limited to a mechanism of button pushing after fulfilling the requirements for a pattern or recipe. Customization is usually limited to preset dyes or similar modifiers that do not require more than a texture change or reskinning of the underlying model. The reward for this grinding may be access to special items or an ability to receive economic payoffs from other players, but is rarely essential to play. The social elements are thus in the gathering of materials, showing off of items as a sign of status or achievement, gifting to demonstrate friendship, or the economic sale of items—not in the act of creation or design [26].

Although the engagement of a craft is made visible through associations with raw materials ranging from thread, fabric, and leather to wood or imagined futuristic metals, the process of making is either invisible or simulated with a few moments of disconnected animation. Even games where the craft system is a dominant element of play function similarly. Casual games that place domestic tasks and women at the center of play typically focus on other aspects of the narrative [11].

Some games do exist in which the game simulates crafting on a deeper level. For instance, Cooking Mama [37] has players creating different recipes step-by-step, with each step involving a dexterity or visual challenge to be performed within a given time limit. There is no room for creativity, in fact the player is punished for not following directions perfectly. This is at odds with one of the most compelling reasons that people craft in the first place, that of an engaged relationship with the materials, process, and product [17].

One notable exception to this hiding of process is Animal Crossing: New Leaf (Nintendo 2012). The making of clothing and other assets within the game's toolset presents players with a challenge of design under constraint, as well as mechanisms to share their creations via social media, resulting in a vibrant community that extended the life of the game [46], not unlike the industries of virtual fashion and housing that developed around Second Life [9].

In most games, truly taking creative control of "crafting" requires manipulating 3D models and external assets through practices such as modding [39]. The success of games such as Minecraft [27], LittleBigPlanet [33], and construction games such as RollerCoaster Tycoon [13], all of which deeply integrate creative expression and communal spaces, suggests the untapped potential of building deep crafting systems into video games.

6.2 Craft-Game Inspired Game Mechanics

Looking beyond the crafting systems that currently exist in games, there are a variety of craft game inspired mechanics that may be used to create new game genres and experiences.

In this paper, we have identified three categories of challenges that are found within craft games. While some digital games have engaged with these types of challenges, most of them have only done so at a superficial level. Given the popularity of craft games among crafting communities largely made up of women, we suggest that there is room to engage with these challenge types more deeply and as primary mechanics.

The majority of the challenges we identified focus on design/aesthetics, object creation, and community. This leads us to believe that there is a space of possible games using these values as primary mechanics that would be engaging to a more diverse audience. There are examples of games that have begun to address these challenges, and their wide appeal supports our claim.

Draw Something [40] engages with design and creation, and also community. The game is played by two players in which one player receives a word that they must draw, Pictionary style. The other player watches an animation of the drawing and must guess the word. Some players engage deeply with the creative aspects of the game, creating detailed images for their words, or using the animations to their advantage to add creative elements. Because the game must be played with others, it also encourages a more communal nature with players talking about the animations and sharing their favorites. Similar to Animal Crossing, Draw Something has a much more diverse player base than that of typical AAA games [38]. While Draw Something provides a glimpse at the base level of adding design, creation, and community to a game, it is not much more than a framework for online Pictionary.

Scribblenauts [1] is an example of how to use design and creation in a more complex way, although it is lacking the crucial community element. Even without the community element, it received a number of awards for innovation [47] showing that this area is worth exploring more, with craft games as a possible guide towards areas worth exploration.

Similarly, while constraint-based and hidden information challenges are common among video games, very few if any engage with design constraints or hidden design information. Some games, such as Diablo III [8] give players the ability to dye or choose colors of armor, banners, or other visual elements that are seen within the game. These changes have no effect on gameplay but allow the players a method for self-expression. The game places no constraints on what colors the player can use other than some minor resource constraints of certain colors only being available from in-game exploration or through purchasing the Collector's Edition of the game. Any design constraints beyond this are up to the player to self-impose if they wish.

Roblox [29] is a massively multiplayer online game platform that is very popular with kids and teens that allows creators to make games for anyone else to play that is also using the platform. These games are light weight and generally free. Because of the democratization of creation afforded by the ease of use and low cost, there are a number of experimental games. One of the more successful of these games allows the players to

compete in a Fashion Show contest. Each player is dropped in a room with a number of things to wear or modify their avatar. They have 60 seconds and a theme they are working towards. After the 60 seconds have passed, the players walk the catwalk and everyone in the game rates each player, with a winner declared at the end. While this is built around a time constraint, a similar game in which the participants have limited materials similar to the design challenges in reality fashion shows is one way to approach this style of challenge.

None of the games we have discussed touch on collective creation, one of the richest areas for craft games. Given the number of games available and the scant number that engage with design, creation, or community, it stands to reason that there is much room for experimentation in games that engage with these challenge types. The success of games in this space and the popularity of craft games show that this area is worth exploring, especially in the quest to increase diversity amongst the game community.

6.3 Materiality

While digital manipulation of crafts currently lacks the materiality of the physical (which is part of the appeal of crafting itself, particularly in a culture with screen time integrated so deeply into leisure, work, and education) a more concerted attempt to emulate and explore materiality would add greater depth to crafting as play. Existing crafting systems pay only rote acknowledgement to materiality, without considering the problems and needs that emerge from environments.

For instance, imagine a crafting system where a player could eventually build a scrap quilt for their home out of the presumed remnants produced from making various clothing, not unlike the "scrap a long" challenges discussed previously. Such a quilt would serve as a form of digital memory system for the character's aesthetic history, just as a scrap quilt does in a physical space. This builds on the existing use of textiles and games to represent comfort and create a sense of physicality and connection [4].

Similarly, the mechanics of physical materials such as dye are treated perfunctorily and uniformly by computational systems. Outside of games, an amateur dyer is highly unlikely to achieve consistent color, while a skilled dyer can control the placement and combinations of colors along a three-dimensional object to produce designs and variance, presenting challenges and opportunities that have been explored in 3D graphics [25] but not integrated meaningfully into existing crafting systems. Adding these elements of nuance to creative play presents an opportunity for finesse and combination, providing rewards for the development of skill.

Additionally, games that we observed crafters engage in often lead to a functional item that is generally gifted. However, crafting in video games is often instrumental – the object is crafted to be sold, to gain experience, to level up a skill, or to display player status. One could imagine a system in which the focus was on what was being created and who it was being created for. Games exist in which items are gifted to in-game

characters such as in the Harvest Moon series [19], but these gifts generally do not involve creative input from the player.

Finally, there is a space of hybrid games, those that are both digital and physical, in which some games have begun looking at crafting controllers for digital games. These games, such as Threadsteading [3], a strategy game played on a computerized sewing machine, and Loominary [34], an interactive fiction played on a loom, which the player crafts a tangible artifact through the course of playing the digital game. These games look to explore the game design space when integrating craft and game play [35] and investigate bringing materiality into the digital game space. None of the games in this genre that the authors are aware of have delved deeply into the types of challenges identified in this paper, leaving a ripe area of exploration.

6.4 Value-Based Game Design

Flanagan and Nissenbaum argue that games inherently reflect the values of those who design them, as well as the values of the community for which they are designed, and general societal values more broadly [15]. As a collection of games created by and for a community with vastly different demographics than that of games traditionally considered in games research, it is thus worth examining how the values inherent in crafting communities are reflected in the game design choices made.

Crafters explore and express their ideas through the act of making; *creativity* is a core value within all crafting communities. The type of creative, playful practice represented by craft games might be placed under the rubric of critical making, which Ratto defines as "a mode of materially productive engagement that is intended to bridge the gap between creative physical and conceptual exploration" [28]. In game studies, critical making is frequently associated with "critical game design," a set of practices associated with critiquing status-quo assumptions, genres, and mechanics through seeking what Flanagan terms "radical" paradigms of play [14]. This self-aware, reflexive practice is also part of craft communities, where play is an intentional framework for challenging artists and communities to broaden their aesthetics, design assumptions, skill levels, and material choices through the act of creation.

Education and *community support* are also common values within crafting communities; for example, the Modern Quilt Guild has as a core portion of its mission to support education [48]. Building new skills and learning from other crafters is common, and several of the game types we describe in this paper are explicitly designed to support this. Some such games – including bees and swaps – encourage players to practice new skills in making a particular type of artifact for a friend. These games are often accompanied by tutorials or patterns for players to learn. Other games, such as mystery craft-a-longs, support best practices for learning and maintaining skills by requiring frequent work on the craft, and motivate players to complete a section before hints or pictures are posted.

Craft games also help build *friendships* within crafting communities, through reinforcing the value of *generosity* common in textile craft communities. Swaps and bees typically

involve players sharing personal information about themselves: their aesthetic preferences, inspirational imagery, and stories that help provide context for players to create something appropriate for the recipient.

In learning from the games crafters play (and design) and how they can inform new digital game designs, we can also consider the role of community values in digital game design practices. Such practices draw upon an established discourse of feminist HCI, which emphasizes interaction design with a commitment to identity, agency, and fulfillment among other values [7]. Some existing spaces within game design communities exhibit some of these values: frequently Global Game Jam and other creative challenge events demonstrate similar paradigms and participatory models as the types of craft play documented her. Many jams use constraints such as aesthetic and art-driven themes, limited time, restricted palettes or mechanics, and other variations on craft game structures to encourage innovation. This can be particularly compelling in the context of games designed around a shared theme or purpose, such as those that emerged from "Ruin Jam" in the wake of the 2016 US election discourse [31].

7 CONCLUSION

Both game studies and game design are increasingly aware of, and engaged in, challenges of community building and extending our understanding of "gamer" to encompass those that are traditionally marginalized [32]. Through our examination of craft games and types of creative play, we have extended the potential boundaries of gaming communities and our objects of study. These community-driven, values-oriented, design-challenging methods of play offer potential models both for engaging a broader range of players and types of play. This work offers game designers a set of modalities for pursuing inclusive, feminist design and rethinking definitions of games and crafts.

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