

Envisioning Future Food, Technology, and Health: Teens' Perspectives Through Design Fiction

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Abstract

Teenage years are a critical period for shaping food practices and health behaviors, yet teens remain underrepresented in research on future food and health technologies. This paper reports on design fiction workshops where 20 teens speculated on artifacts such as health-tracking mirrors and food-making machines while reflecting on their eating habits and values. Our analysis shows how teens negotiate their human stances in a techno-centric world, balancing excitement about innovation with concerns over health, control, and responsibility. We contribute to HCI by: (1) identifying teen-specific design considerations for reflective healthy-eating technologies, highlighting “absence” as a protective affordance; (2) reframing food technologies for teens as sites of family care and playful identity work, opening a design space at the intersection of reflection and play; and (3) advancing methodological understanding of youth-centered design fiction by showing how dual-mode speculative workshops can move teen participants beyond solutionist or anti-solutionist positions toward grounded negotiation with sociotechnical systems.

CCS Concepts

• **Human-centered computing** → **Collaborative and Social Computing**; *Empirical studies in collaborative and social computing*.

Keywords

teens; design fiction; food; healthy eating

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1 Introduction

Teenagers are in a formative stage where lasting habits around food and health [109] take shape, influencing not only nutrition but also identity, social life, and well-being [37]. Today's teens navigate these practices in a more complex environment than previous generations. Offline influences—family, peers, schools, and community—remain central [113], yet now intersect with digital forces such as algorithmic food recommendations on social media [124], food-tracking apps [22], and targeted food e-marketing [46, 99].

Past literature in HCI has explored technologies around making and interacting with food, especially in the field of Human-Food Interaction (HFI) [4, 5, 29, 40, 59, 63], investigating playful food interactions, sustainable consumption, and adult perspectives on food technologies [4, 5]. Despite these significant contributions, the voices of teens are often left out in the design of these technologies. Indeed, relatively little is known about how teenagers, in a critical development stage of their eating habits, envision the intersection of food, technology, and health, or how they articulate ethical concerns and playful engagements in these futures.

We see this as an opportunity to create space for teens to imagine, through design, how they might engage with and reflect on food technologies in ways that align with their health, ethics, and playfulness—which is essential for developing health technologies that resonate with their values and lived experiences. In this research, we use design fiction to invite participants to tell stories about new technologies and their impacts on ethics, values, society, politics, and emotions [19, 27, 91].

We conducted a series of design fiction workshops with teenagers to envision food-related technologies—from futuristic food-making machines to digital systems encouraging healthier eating. From these workshops, we sought to answer the following question: *How do teens envision and design future food technologies to shape their daily lives?*

Our findings reveal three central themes. First, while teens assumed future technologies would aim to optimize healthy behaviors, they emphasized that eating is also bound up with complex

emotional needs that technologies must acknowledge. Second, although efficiency and automation were expected features of food technologies, teens stressed that these should not replace the human experiences of making food and building healthy practices with family. Finally, even as technologies were imagined as normalized within capitalist systems, teens expressed aspirations for designs that would reduce harm and promote more equitable food futures.

Through these speculative exercises, we show how teens reflected critically on their health choices, revealing a sensibility around ethics, care, and human-ness. Building on these insights, our work makes three contributions to HCI: (1) We introduce how teens imagined temporal, spatial, and informational forms of “absence” as protective affordances for mood, eating practices, and identity, and design principles like supporting refusal and deferral (“not now,” “ask later”) as well as spatially-appropriate engagement. (2) We expand the framing of food technologies for teens beyond tools of control or tracking, positioning them instead as sites of fantasy, sensory delight, family care, and playful reflection tied to identity experimentation. (3) We contribute methodological and theoretical insight by showing how speculative methods can surface teens’ pragmatic negotiations with food technologies, extending HCI’s understanding of youth agency and how technological futures are imagined as ongoing negotiations rather than purely solutionist or anti-solutionist positions.

2 Background and Related Work

2.1 Teens and Healthy Eating Technologies

Teenage years are a formative period for establishing dietary habits that often persist into adulthood [33, 55, 77, 95, 109]. Nutritional demands during teenage years are higher than at other life stages, making food practices during this period particularly consequential for long-term health outcomes [35], and continuing into adulthood [121].

Beyond nutrition, eating practices are deeply integrated with social belonging, identity, and status [37]. Family meals also provide a context for socialization and identity development [50, 51], while peers and broader cultural trends also influence teenagers’ choices [9, 69, 100, 122]. In particular, teens today live with digital technologies that mediate their food experiences in powerful ways. Social media platforms such as TikTok and Instagram are central to how food practices are represented and spread, influencing everyday food practices and reflection of healthy eating [123, 124]. At the same time, teens are exposed to targeted food advertisements and health campaigns, which shape food perceptions and behaviors in ways that are not always transparent or beneficial [2].

Body image plays a sensitive and key role in teenage years, shaping both mental health and self-esteem [1, 30]. Defined as a perceived physical feature, shape, and weight, body image is a concept actively sought due to stereotypes of physical attractiveness and the fear of body shame, a negative emotion that occurs when one’s own body ideal does not conform to an internalized body ideal [78, 117]. It is especially salient for teens, whose rapidly changing bodies make these perceptions particularly vulnerable to cultural and social pressures [34]. The connection between body image and eating habits is consequential, as body dissatisfaction often fuels restrictive dieting, disordered food choices, or avoidance of certain

meals [94]. For instance, the risk of developing eating disorders is associated with the preference for photo-based platforms such as Instagram and Snapchat [25, 31, 92]. Other work has shown how platform features, such as Instagram’s feed and comparison mechanisms, can reinforce these dynamics and negatively impact teen wellbeing [52].

Research has revealed ways teens also experiment with personal informatics and tracking tools, revealing their desire for technology to be more integrated with their routine and support mental health [97]. Mobile food tracking apps, which let teens capture images of meals, show promise for improving dietary assessment, as studies reveal sustained use hinging on features like gamification and clear purpose [22]. However, commonly used, adult-oriented self-tracking “nudges” to teens can be potentially ineffective or even harmful. Studies show that tracking often fosters competition, guilt, and skepticism about its educational value [79], while reinforcing narrow views of health shaped by peer surveillance, self-surveillance, and normative standards [61, 79]. Moreover, rapid bodily changes during teenage years make it difficult to interpret data like steps, heart rate, or calories when benchmarked against adult norms [56]. Existing technological interventions for teens to approach healthy eating, such as nutrition tracking apps, often emphasize calorie counts and behavior change nudges, but these can produce feelings of guilt, competition, or pressure, particularly for teens [38, 79].

Prior work has shown how teens navigate food practices in environments shaped by existing digital systems. Teenagers were studied on their behavioral, psychological, and societal impacts of technology, highlighting how young people are both critically affected by and profoundly evolving with these digital tools. However, current studies have seldom looked into ways teens can actively shape the way they eat, share, and reflect. This gap in the literature leaves a critical space for inquiry that needs an intentional probing space for teenagers to envision and design supportive and socially meaningful food technologies. In doing so, we extend scholarship on digital health design by shifting the focus from simply evaluating the effects of current systems to articulating design principles that promote youth agency and well-being.

2.2 Speculative and Playful HFI

HFI refers to the work around food practices that range from agriculture, food preparation, eating, sharing meals and cleaning up, and the interaction phases spanning across growing, cooking, eating, and disposal [81]. Within HFI, early work argued for moving beyond deficit-based models of “fixing” eating toward more celebratory and socially situated engagements with food [63]. Later syntheses expanded this space, highlighting playful and experiential interventions that focus on meaning-making and cultural practice alongside nutrition metrics [3, 4, 6]. For example, design of playful eating experiences uses sensing to detect eating/drinking actions and triggers playful sound feedback, exploring how design can support stimulation and hedonism in eating [118, 125]. Multi-sensory design and embodied interactions around food have also been explored to influence food experience [59, 119].

HFI researchers have leveraged speculative formats (e.g., workshops, public events, “edible speculations”) to critique technology-driven, start-up style interventions in food systems and to reimagine

food technologies through critical, ethical, and experiential lenses [21, 40, 67]. Likewise, previous work recognized the complexity of HFI and the controversies around current technosolutionism with digital innovations, calling for equitable investigations for safety and privacy of HFI [41]. Specifically, HFI researchers have worked around the notion of reflective, healthy eating habits [80, 82], foregrounding slow and companion-like eating practices.

HFI researchers have previously worked with children and teenagers as main users. They are shown illustratively by drawing playful eating behaviors from children [3], enabling them to personalize a DIY food preparation tool [106], and investigating children needs and conflicts in family-food interaction [129]. However, these projects typically focus on younger children and on task-specific interactions, rather than on teenagers' broader perspectives, identity development, or values around food and health. They have yet to position teens as central partners in envisioning speculative food technologies or in shaping the foundational assumptions behind future systems. Our work addresses this gap by using speculative scenarios as a way for teens to surface concerns, hopes, and tensions around food, and by foregrounding these perspectives as core inputs to the design of future food technologies.

Finally, HFI research acknowledges that, ultimately, food systems constitute self, individuals, and systems, as well as political, social, and environmental discourse. For example, Choi et al. endorsed the deployability and interoperability of food sustainability to be more inclusive [29]. Recent work [10] acknowledges this gap to qualitatively uncover the conflicts between technological novelty and human values in food practices. This is especially relevant in exploring societal implications of HFI design [93] as food fundamentally influences the self, individuals and plurality as a society. For HCI, this implies positioning participants not as targets of behavior change technologies but as co-authors of future food cultures with co-design processes, in ways that respect personal life, cultural identities and family routines. Velasco et al. argue for future HFI studies to more widely adopt such methods that go beyond workshop demos or laboratory food concepts [120].

Food waste, food insecurity, and environmental problems still remain a dire problem necessitating systemic awareness of foodscapes and distribution channels [114]. Thus, HFI can benefit from approaches that foreground equity, care, and critical reflection, beyond simple novelty or efficiency. It is increasingly important to include the voices of all stakeholders involved in designing such a future, including young people and future generations.

2.3 Futuring and speculative design in HCI

In HCI, speculative design and design fiction use near-future scenarios, artifacts, and narratives to provoke critical reflection and debate about preferable sociotechnical trajectories [44]. Design fiction has been noted for having conceptual ambiguities, motivating careful methodological articulation when working with participants [90]. Building on this, Speculative Enactments invite participants to act within consequential, staged futures, an approach that can surface values, frictions, and appropriation strategies relevant to everyday eating and family life [47]. Speculative and probe-based methods

also include workbooks and cultural probes, which externalize ideas and enable “out-of-the-box” thinking and reflection [58]. Design fiction serves as a powerful tool for excavating the underlying social and political issues of a society, using fantastical prototypes based on critical design principles [19, 20]. However, the democratization of this method remains a challenge within the HCI community.

Critiques in HCI emphasize that critical design traditions themselves have often been practiced from privileged positions and can overlook intersecting oppressions unless explicitly reoriented toward equity [11]. Likewise, the nature of HCI scenarios probing to solve the problem or ‘*overcome the monster*’ has been criticized as being “solutionist” [19], which demands a co-design approach that welcomes the inherent limitations of any system. Recent CHI work demonstrates how speculative co-design with historically marginalized youth expands whose futures get imagined and how (e.g., remote speculative workshops with Black young adults), offering concrete facilitation strategies and ethical commitments in their living contexts [66]. By engaging diverse populations, design fiction can more effectively scrutinize social, political, and cultural dimensions and provide a more inclusive and sustainable design approach for societal topics like health and food.

2.3.1 Design Fiction in Teen-Computer Interaction. Children and teens have participated in technology co-design endeavors historically because of their strong design and academic contributions [14]. Employing teens as design partners [42] provides unique idea generation and prototype development while empowering them and building self-efficacy [72]. Teens provide a realistic and future-forward world overview to design due to their fluency with technology as digital natives [43]. When engaged in design fictions, teens who have lived through the saturation of digital technologies can offer invaluable insights into policy making and design directions [17]. When youths are the protagonists in story-making, they can unlock and take control of when and how technology can be used [72]. In particular, with design fictions, sensitive topics revolving around human vulnerabilities can be mitigated [57]. Blythe et al. argued that design fictions can be an insightful method to understand a user's nuanced and hidden worldview [20], hinting that youth-based design fiction can inform deeply intimate topics such as food and food systems.

In this research, we chose design fiction to engage with teens because of its playfulness and its ability to recontextualize personal and sociopolitical worlds [57]. Specifically, we employed storyboarding for its visual narrative potential [28]. At the same time, we used diegetic prototyping, the active making of a non-existent artifact to demonstrate its situated use, for its discursive engagement and consequences, manifested in sci-fi movies like *Her* [89]. Anderson's framing of making “Magic” as a metaphor for unknown technology for children to design *Magic Machines* for themselves showcases the benefits of tangible diegetic prototyping [7]. Because the nature of food design requires physical use before, during, and after an interaction, it is vital to consider both a qualitative and physical prototyping method to visualize experiences and enable “thinking with their hands” [71]. In this way, our co-design fiction method sought to enable teen participants to express their concerns and excitement through narrative and tangible artifacts. In turn, these activities allowed teens to unpack sensitive, multi-layered topics and reflect on systemic flaws and biases beyond individual preferences.

3 Methods

3.1 Pilot Study and Workshop Preparation

We first conducted a pilot study with six teenage interns at our university (ages 16–17) to test the workshop format, refine the design prompts, and identify accessible prototyping materials. Insights from the pilot directly shaped the structure and prompts of our speculative design workshops. Pilot participants found it easier to speculate when prompts referenced far-future scenarios and when storyboards were centered on fictional personas rather than themselves. Near-future scenarios limited teens' imagination because they became preoccupied with feasibility, questioning whether a technology could realistically exist in 50–60 years. Anchoring the activities in the far future removed these constraints and encouraged more playful, expansive ideas. When we asked teens to describe their own eating challenges, many hesitated to share, explaining it felt too personal and preferred not to disclose. In contrast, using fictional characters allowed them to more candidly project experiences and reflect without worrying about self-judgment or revealing vulnerabilities.

These insights led us to position activities in the year 2145 and allow participants to use a fictional protagonist's body in their storyboards. The pilot also led us to refine both the Magic Food Machine and Future Self Mirror prompts to improve flow and elicit richer design ideas; for instance, we used guiding questions (e.g., "What is this person's daily life like?") to help teens create convincing character backstories with motivations and constraints. Our study received approval from the university's Institutional Review Board (IRB) prior to conducting any research activities, including pilot testing, and was amended iteratively based on insights from the pilot phase.

3.2 Speculative Design Workshops Prompts and Process

Our objective was to explore holistic views of teenagers on food practices, including reflection, making, and eating. We designed two workshop activities, the "**Future Self Mirror**" employing a storyboarding method and the "**Magic Food Machine**" employing Magic-Machine making [7] as a diegetic prototyping method.

Each participant worked in a group of two or three to complete the first activity and moved on to the next activity within the same group¹ after a 15-minute break. Sessions took 2–2.5 hours to complete the Future Self Mirror activity and the following Magic Food Machine activity. Four sessions had two groups simultaneously working together in the same classroom, while the last session had one group. To support both individual expression and collaborative idea building, teens were given the option to work independently or together for both activities.

Future Self Mirror. HCI and public health research examining eating practices and digital health tools have shown that food practices are equally about self-understanding, body image, and social belonging. However, more research is still needed to understand how teenagers—as digital natives [98] navigating their more formative life stages—envision food technologies as spaces for health

habits and identity exploration. To probe this dimension, we developed a design fiction prompt, Future Self Mirror, that asks teens to reflect on how technologies might project trajectories of health and identity. It also encourages them to articulate the values and vulnerabilities they associate with their future selves.

In this activity, we asked, "*How do teens approach using technologies to reflect on their eating practices and envision their future practices for well-being?*" Teams were prompted to imagine their everyday encounter with a "magic" mirror that renders likely futures according to a person's eating and broader well-being practices. We asked participants to construct a narrative using a paper storyboard that included: who is using the mirror and where; what goals motivate use; what interactions happen between the mirror and the user; what data the mirror may or may not access and who authorizes that access; and how these interactions might ripple into family, school, or workplace dynamics. We aimed to use the prompt to engage teens in telling stories about how technologies might reflect and predict their eating and well-being practices, allowing us to see what they care about through the stories and the discussions that unfolded around them (Figure 1, (b).)

Magic Food Machine. Technologies that support adolescents' eating practices often emphasize interventions, yet few account for their distinctive developmental needs while taking a holistic view of food practices that includes exploring, planning, making, and reflecting. In particular, the act of making or accessing food—central to how teens learn skills, experiment with identity, and negotiate family and cultural routines—has been relatively underexplored in HCI. Thus, we introduced the tangible prototyping of "Magic Food Machines" as a way for participants to imagine future technologies that engage with food preparation and consumption directly.

In this activity, we asked, "*How do teens wish to shape their food practices and imagine future food preparation, making, and consumption?*" To allow reflections on the processes of food making and consumption, this activity involves physical prototyping. Participants were given cardboard boxes, along with assorted craft supplies such as pens, markers, scissors, glue, clay, and decorative materials (Figure 1, (b).)

Teams received the following prompt: "It is the year 2145; we live in the world where a 'Magic Food Machine' can make any food." Participants were prompted to specify location, intended user(s) (e.g., personal, family, or public), food-making process (e.g., printed, plated, or capsuled), and distribution model (e.g., public facility, subscription, or rental). Using Bodystorming (or embodied storming) [105], participants were asked to demonstrate the machine they created by role-playing making the food and consuming the generated food. In this way, we sought to elicit teen desires and avoidance around technology-supported food practices.

3.3 Workshop Facilitation and Data Collection

Workshops began with the Future Self Mirror activity, followed by the Magic Food Machine.

During the workshop, researchers conducted group interviews, took observational notes (documenting group interactions, notable quotes, non-verbal cues), recorded audio and video, photographed prototypes, and supported teens throughout the designing and building activities.

¹The one participant who requested to switch groups was accommodated to ensure comfort and psychological safety, an important principle in youth-centered co-design.



(a) a



(b) b

Figure 1: Participants (a) brainstorming Future Self Mirror storyboards and (b) selecting craft supplies to create Magic Food Machines

We approached the workshop with careful attention to the power dynamics between adult researchers and teen participants. Following youth-centered participatory design practices [73], we ensured that all prompts were age-appropriate and did not cause discomfort, emphasized that the workshop was not evaluative or graded, and positioned ourselves as co-learners rather than assessors. Teens were reminded that participation was voluntary, that their contributions would be anonymized, and that they could skip any activity. We used small peer groups and creative, hands-on making to reduce adult authority and encourage candid expression; teens often speak more openly when collaborating with peers rather than addressing adults directly. Tactile, creative activities also shift attention away from performing for adults and toward exploring ideas together. When participants described certain prompts as “too big” or daunting, we validated those feelings and reminded them that our activity was an exploration rather than a test. Across sessions, we allowed teens to choose how they engaged within their groups. For the Future Self Mirror storyboards, most participants preferred sketching individually before sharing ideas; for the Magic Food Machine, we encouraged collaborative building, though a few teens still chose to construct their prototypes separately due to comfort levels.

Individual versions tended to be more personal or culturally specific in style (for example, naming the machines inspired by an international brand, machines tailored to their own aesthetic preferences) but still represented the shared concepts and themes

generated during group discussion. Above practices reflect our commitment to teen agency, emotional safety, and ethical facilitation throughout the workshop.

3.4 Participants and Recruitment

We recruited 20 participants aged 14 to 17 (Average = 16.55), including 7 boys and 13 girls via convenience sampling. The primary pool of participants was recruited from a science camp at a university on the West Coast of the United States. We conducted five workshop sessions, yielding nine groups total (G1–G9). In the first four sessions, two groups participated simultaneously (eight groups), and in the final session, one group (G9) participated alone. Each group consisted of two to three teen participants. We chose to run two groups simultaneously because it created a lively but still intimate atmosphere where teens could feel part of a shared creative space while working in small, comfortable teams. This structure also helped maintain an appropriate facilitator-to-participant balance, which is important for preventing teens from feeling outnumbered or scrutinized. Practical scheduling considerations for both teens and researchers further supported this approach, making two parallel groups the most youth-friendly and feasible format. For the one session that included only a single group, we adjusted researcher roles to preserve the comfortable dynamics of our other sessions. One facilitator took a secondary, low-visibility role focused on providing practical support (e.g., helping with building materials or clarifying storyboard instructions), while the primary facilitator guided the conversation. This ensured that teens did not feel outnumbered and that the session remained consistent with our youth-centered approach. Additional participants were recruited through snowball sampling, personal contacts, and local outreach efforts. Given the participant age group and their interests in scientific research, they had exposure to digital technologies growing up and were proficient in speculating around new technologies. We stopped recruitment once consecutive sessions produced no new themes or design concepts, indicating saturation [104].

Table 1 summarizes participant ID (with G# indicating their group, and P# indicating their participant number), gender, age, food environment, and their Future Self Mirror and Magic Food Machine designs.

3.5 Data Analysis

We employed an inductive and deductive thematic analysis [24], drawing on methods of collaborative clustering and affinity diagramming [68].

Initial familiarization: Two researchers independently reviewed transcripts, video recordings, and participant-produced artifacts, producing detailed summaries of participants’ stories about the Mirror and Food Machines, their envisioned functions, and critiques of technologies. The researchers then met to align interpretations, ensuring that our analysis was grounded in participants’ framings before moving to higher-level abstractions.

Clustering and theme development: We uploaded transcripts to an online collaborative whiteboard, breaking them into 1,247 sticky notes and adding images and video descriptions. Researchers first conducted affinity diagramming in parallel, clustering excerpts into

Table 1: Participant Demographics, Food Environment, and Summary of Design Fiction Concepts

No.	Gender	Age	Food Environment*	Future Self Mirror	Magic Food Machine
G1P1	Girl	17	Indian food culture at home in California	Penguin therapist mirror	Tall vending machine that grows tall objects like veggies and has a food sticker to peel off and activate food heating
G1P2	Boy	16	Indian food culture at home in California	Health Viz mirror	
G2P1	Boy	17	Hispanic food culture at home in Arizona	Home-installed mirror with personalized goals and future	Portable, foldable food machine to bring anywhere; operates on tokens that satisfy emotional cravings
G2P2 → G1P3**	Girl	16	Studying abroad in Canada; away from home (Chinese) environment	Built-in fridge mirror with normal/health-tracking toggle options	
G2P3	Girl	16	None disclosed	Mirror with regular and fitness tracker modes	
G3P1	Boy	16	Korean food culture at home in California	Health Paths Mirror that projects good, continued, and bad self	Microwave-like food machine with buttons for type of food, calories, portion, taste, and other settings
G3P2	Girl	17	Korean food culture at home in California	Personalizable, portable mirror that tailors the user to look good on dates	
G4P1	Girl	17	Persian food culture at home in California	Mirror with appearance and perception reflections	Machine with two funnels with Face ID to output food and recycle leftovers
G4P2	Girl	17	Mostly eats American food at home	A coach and motivator mirror to guide through choices	
G5P1	Girl	17	Studying abroad in Bosnia; away from home food environment	Mirror to track habits for a couple	Brain-to-machine vending food machine for portion-controlled meals
G5P2	Girl	17	Indian food culture at home	Mirror with gamified healthy streaks with multiple modes	
G6P1	Girl	17	Korean food culture at home in California	Mirror for skincare with face analysis and future projection	Food machine that turns fresh ingredients into complete meals while preserving nutrients
G6P2	Boy	17	Mostly eats American food at home	Negotiation mirror to balance meals and help studying	
G7P1	Girl	17	Indian food culture at home in California	Mirror for daily logging and a harsh warning for junk food	Machine with two channels: one inputs natural ingredients and the other outputs processed foods
G7P2	Girl	17	Indian food culture at home in California	Mirror that warns future sickness with unhealthy diets	
G8P1	Boy	14	Asian food at home	Mirror that scans people with nutritional and health data	3D food printer printing carbs, protein, and fat
G8P2	Girl	15	American food at school and at home	Mirror that helps an obese person by predicting health / shocking them	CMYK food printer that prints food molecules using cartridges
G9P1	Boy	17	Very healthy family meals at home	Mirror with health visualization/support but with many ads	Dining table machine where users purify inedible or expired food with a magic pen that draws flavor icons
G9P2	Boy	17	Vegetarian Indian food at home in California	Mirror with goals and overview provision to motivate workouts	
G9P3	Girl	17	Autonomous eating; frequently eats out	Mirror with realistic goal-setting	

* These details were not elicited through demographic questions but were offered voluntarily by teens as part of their own descriptions and stories during the workshops. During IRB review and consultation with youth-program partners, we were encouraged to focus on non-sensitive descriptors (e.g., age, general living context) unless demographic variables were essential to the study's aims. Allowing this information to emerge naturally reduced participant pressure. The descriptions, therefore, represent interpretive summaries of what they self-disclosed during the workshops, not predefined demographic information.

**G2P2 → G1P3* indicates transition from Group 2 to Group 1. She moved after the Future Self Mirror activity due to group dynamics.

related ideas (e.g., desired machine functions, design rationales, critiques). We then met to merge, split, and reorganize clusters through multiple rounds of collaborative sense-making. This allowed us to iteratively surface themes via comparison and refinement of clusters. For example, we identified separate themes around what teens value in food experiences, health, and technological support. As analysis progressed, we saw these themes overlapped and reflected two broader patterns: technologies teens expected given current norms and features they wished to push back against those norms. We therefore merged the initial themes into these higher-level categories to better represent their shared conceptual structure.

Iterative refinement: Through at least five rounds of iteration, we returned to the raw data to test whether emerging clusters

and themes adequately reflected participants' accounts. During this process, we identified broader organizing structures—such as the give-and-take in how teens approached technologies and the levels of scope (intrapersonal, meso, societal) at which values were articulated. These insights allowed us to move from descriptive clusters to higher-order themes capturing both designs and the relational values embedded in them. Our final thematic framework emerged through consensus coding [101], in which we resolved disagreements and refined interpretations until convergence.

Our analytic approach emphasized iterative sense-making and researcher reflexivity. Analytical disagreements were treated as opportunities to surface alternative interpretations and refine conceptual boundaries. Across multiple passes through the data, we

compared excerpts, reviewed memos, examined outliers, and adjusted our developing structure to ensure that themes accurately captured both the concrete design ideas generated in workshops and the broader value orientations expressed by teens. Through this repeated cycling between data and interpretation, we arrived at a coherent thematic framework that was stable across the dataset. Convergence was determined when successive rounds of clustering and discussion no longer yielded new distinctions, indicating that our analysis had reached sufficient conceptual depth for the claims advanced in this paper. This framework, capturing nuanced relationships among key findings, formed the basis of our thematic narrative and enabled us to integrate multiple perspectives into the final results.

4 Findings

From our design fiction workshops, all participants created individual Future Self Mirror storyboards, and a few decided to collaborate on making the Magic Food Machine, resulting in 20 different storyboards and 12 different food machines. Our workshop results revealed that teens quickly embraced the speculative technological innovation but drew firm lines around what must remain “human”. We present how teens negotiated between the norm of current technology design versus their desire to protect what they valued. We structure our findings into three main themes along two dimensions: the norm of technological growth (what teens *think technology will do*) and the needed negotiation to preserve human experience (what teens *want technology to do / not do*), summarized in Table 2.

Our three themes are: First, on a micro level of personal emotions and health, teens considered that technologies will optimize healthy eating, but they believed that eating involves complex emotional needs that must be accounted for. Second, on a meso level of family food practices, teens knew that technologies will provide efficiency and automation in food-making, but they emphasized that human experiences in making food and building healthy practices should not be replaced. Last, on a macro level, teens thought that technologies are normalized to embed within a capitalistic system, will grow to become ubiquitous and surveilling, and will consume excessive energy, but anticipated technology designs to achieve a less harmful and more equitable food future.

4.1 Protecting Emotional Needs in Health Optimization

While teens recognized that health technologies will focus on counting nutrients and support mainstream body ideals, they wanted these tools to protect the joy in eating and gentle, harm-free reflection. Conscious of what they are eating, teens actively navigate trade-offs between everyday hedonic, emotional satisfaction of food (e.g., snacking and enjoying sugary food) and keeping up with their idea of healthy eating (e.g., making sure they have enough food or avoiding overeating). Some shared their effort of healthy eating, often casually, such as “*seeing if there are vegetables and a source of protein*” (G1P1 and G5P1), and “*avoiding sweet intake*” (G1P2 and G2P2).

4.1.1 Technology norm: Optimizing for nutritional and physical health.

Nutritional optimization. Teens expected technologies to support caloric and nutritional health and designed the Future Self Mirror as an information display showing numeric caloric/nutritional health data (G1P1, G1P2, G5’s Story, G9P2). For example, G1P2’s story describes using the Future Self Mirror to monitor daily carbohydrate intake and generate future food plans, reflecting his view that tracking food is essential for maintaining energy (see Figure 2).

As some teens struggled with overeating (G9P2), snacking (G2P1), or not eating enough due to stress (G1P1), they envisioned future food machines that calibrate portions to their nutritional goals: “*It [helps] meet your goals, splits them (the calories and nutrients) into three meals, and cuts snack calories to negligible amounts*” (G9P2). Having once gone through a phase of under-eating brought on by family stress, G1P1 envisioned a health mirror that could help prevent similar struggles. In her design, a penguin avatar stood in for her well-being, keeping track of eating patterns and encouraging sufficient nutrient intake (see Figure 3).

Body Optimization. Optimization was presented as a central feature of future-oriented food technologies speculated by teens. G3P1 described a Future Self Mirror interface that visualized three versions of the self: an “optimized self” who exercised more and adopted healthier eating practices, a “continued self” who maintained current habits, and a “lazy self” who indulged in snacks and exercised less. The mirror displayed these three possible selves side-by-side, highlighting contrasts in body size and physical appearances (see Figure 4).

4.1.2 Teens’ negotiated stance: Food practices and maintaining well-being should still be enjoyable.

Acknowledging Emotional and Hedonic Well-being. Instead of focusing solely on optimizing health, teens emphasized that food should be enjoyable: “*I try to go for healthy, but obviously I like fried chicken, burgers—I eat them, and I feel happy.*” (G4P2). Taste is essential to teens’ emotional well-being. When meals are unappealing or options are limited, they reach for sugary desserts, drinks, and ramen to preserve some enjoyment in eating. Recalling being in a summer camp and craving for ramen late at night, G2 designed the food machine as a portable, everyday source of comforting food to rescue them from the unappealing meals they were served in the camp (See 5 Left: the *Portable Food Machine*).

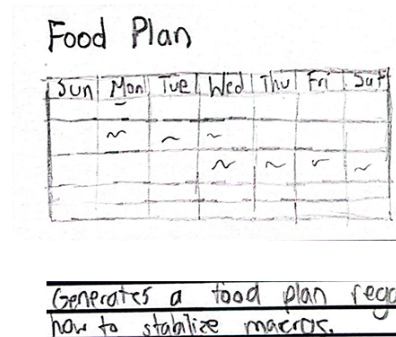
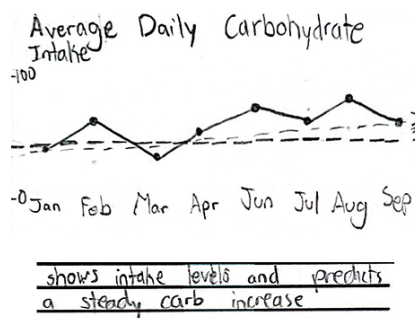
Others proposed a straightforward way to enjoy preferred foods without feeling guilty. One proposed machine allowed customizing the calories of their favorite foods within daily target: “*What if you could make a burger with one calorie but [it] still tastes like a burger? Or one burger that packs all your daily nutrients?*” (G9P1). Another could tailor food portions to calorie targets (G3P1, G3P2, G9): “*I click the button, but I’ve already hit my calorie goal, so the machine gives me Cheetos that taste the same but have one calorie*” (G9P2). G3P2 envisioned a control knob on her machine that allows users to customize calorie levels (See Figure 5 Middle: *Customizable Calories Food Machine*).

Beyond the comforts of eating, teens emphasized the playful and exploratory dimensions of food. They imagined food machines reproducing dishes they had seen on TikTok, where aesthetic

Table 2: Themes, Technology Norms, and Teens’ Negotiated Stances

Theme	Technology Norm: what teens <i>think</i> technology will do	Teens’ Stance: what teens <i>want</i> technology to do / not do
Protecting Emotional Needs in Health Optimization (on a micro level)	Optimizing for Physical Nutritional Health <i>Sub-themes:</i> – Nutritional optimization – Body optimization	Food practice and well-being should still be enjoyable <i>Sub-themes:</i> – Acknowledging Emotional and Hedonic Well-being – Pushing Back Reflection Technologies that Fixate on Body Image and the Perfect Self
Protecting Human Experience in Efficiency (on a meso level)	Efficiency and Automation in Food Making <i>Sub-themes:</i> – Time-saving and convenient food practice – Automated food processes	Being cared for and having agency <i>Sub-themes:</i> – Family care in food – Human-in-the-loop eating journeys
Protecting Food Access, Privacy, and Sustainability in a Techno-Capitalist System (on a macro level)	Commercialization, ubiquity, and energy consuming <i>Sub-themes:</i> – Tiered pricing models for food, services, and products – Everything, Everywhere: Systemically ubiquitous – Energy Consumption and Excessive Use of Resources	Equitable Access, Negotiating Privacy, and Sustainability <i>Sub-themes:</i> – Equitable food access within consumerism – Negotiating Protection of Privacy Through Food Technologies – Negotiating Sustainable Food Futures

Nutrition Navigator - G1P2

**Figure 2: The Health Viz Mirror by G1P2: a story about how one could use the Future Self Mirror to check daily carbohydrates and generate food plans accordingly.**

clips evoked taste and sensation, like imagined flavors, ASMR²,

and gooey visuals. Teens were excited that they could enjoy non-existent food like “AI lava”³ (G9) or “moonbeam ice cream”⁴ (G2)

²“ASMR” (autonomous sensory meridian response) [126] on social media refers to sensory-focused videos that evoke tingling relaxation, often framed as intimate, soothing experiences circulated through algorithmic feeds. Common examples of food ASMR include crunchy fried chicken, slurping noodles, chewing mochi, sizzling meat, and crinkling snack wrappers.

³“AI Lava” refers to a visual food trend popular on TikTok, where creators craft or showcase lava-texture-like dishes using generative AI, in a dramatic, ASMR-style

⁴“Moonbeam ice cream” is not an actual existing food. Originating from a lyric from Benson Boone’s song Mystical Magical, moonbeam ice cream has sparked a lively discussion across TikTok, Reddit, and other social platforms as people imagined what it tastes like.

Caring for Penguin, Caring for Self- G1P1

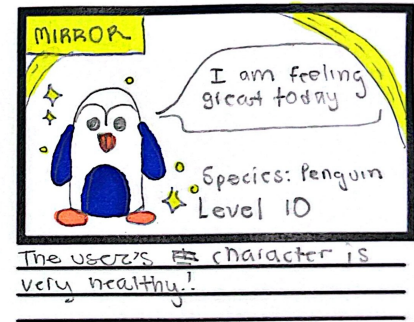
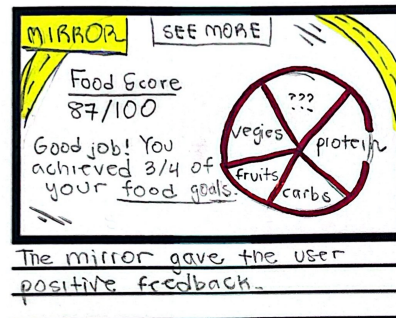


Figure 3: The Penguin Therapist Mirror by G1P1 in which a stressed girl sees a penguin avatar in the mirror that symbolizes her well-being, monitoring her eating habits and offering supportive guidance for nutrients intake

Health Paths Mirror - G3P1



Figure 4: The Health Paths Mirror by G3P1: The mirror shows a “good,” “continuing,” “bad” version of self, depicting different possibilities based on how much effort one makes in exercising and eating healthy. The protagonist in the story ends up working very hard because he doesn’t like what he sees in the “continuing” and “bad” versions of himself. This storyboard shows how by default teens would come up with technologies trying to optimize health when speculating.

made by the machine, adding to the emotional comfort and enjoyment of food experiences even when they cannot actually taste them (See Figure 5 Right: Moon bean ice cream).

Pushing Back Reflection Technologies that Fixate on Body Image and the Perfect Self. Teens thought reflective technologies are too often treated as a health optimization tool. Some pushed back with reflective designs that help rather than harm their emotional well-being.

Even without numbers or charts, goal-setting/reflection tools can present an “optimized self” that teens worried would trigger fixation. Seeing the ideal self in the future mirror could be motivating but make one obsessive: *“Feels counterproductive. People might become obsessed, constantly staring into it.”* (G9P2). G4P1 similarly said, *“What if even when we see our ideal selves, and think that it is still not enough?”*

Teens emphasized the importance of protecting their emotional well-being from potentially harmful reflection time. While reflecting to plan for the day in the morning and recapping at night is a norm some agreed on, they also wanted the option of switching

off: *“I didn’t want it to feel pressuring or overwhelming. I imagine it having two modes. Most of the time, it would just act like a regular mirror.”* (G2P3).

Setting realistic goals that could actually motivate instead of disappointment was also highlighted. As they thought about how they would appear in the mirror: *“It should show a realistic dream, not plastic surgery results”* (G9P3). They wanted to seek adjustable forecasts (from 90 days to five years) to reach goals at a healthy pace—*“... if you drop very fast, it’s easy to get the weight back.”* (G2P1)—and flagged the risk of demotivation if projections show minimal change: *“What if it shows one year later and there’s not a huge difference? That would be so sad”* (G2P2).

Teens envisioned more communicative technologies that engage them in negotiation and companionship rather than issuing one-way instructions. The protagonist in G4P2’s storyboard, Bob, is encouraged and reassured because the mirror *“promised”* him to help reach his goals. In another case, G6P2 wanted the mirror to confront trade-offs with them, reasoning about the give-and-takes of their eating habits, debating whether he should have two meals

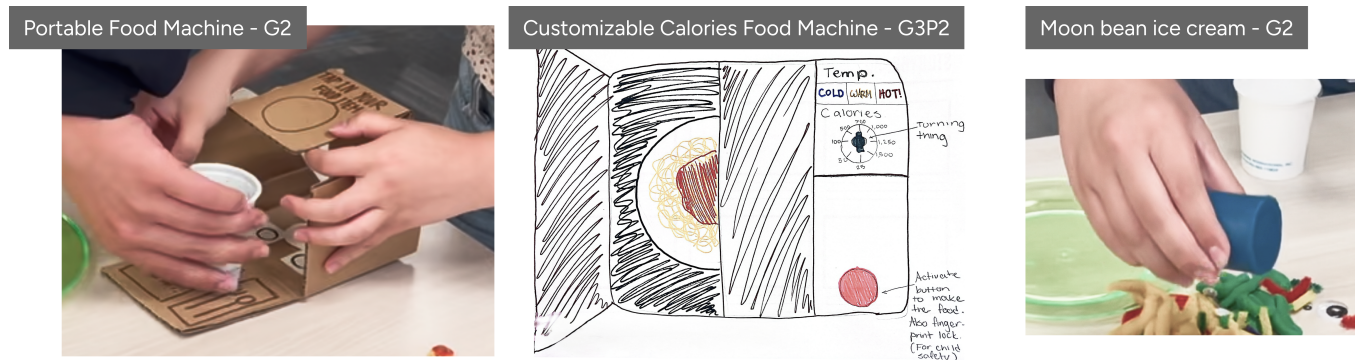


Figure 5: *Left:* the Portable Food Machine allows them to enjoy snacks and food they crave anytime, anywhere. It also allows a cooking option where it expands into a stove-top. *Middle:* the Customizable Calories Food Machine allows users to adjust the calories of the food they put into the machine. *Right:* G2 imagined moonbeam ice cream being made from the magic food machine.

a day (despite his mother disapproving), or have three meals a day (but he will likely feel sleepy during the day from being too full) (Figure 6). This vignette illustrates teens' preference for dialogic, reason-giving systems that surface trade-offs, acknowledge family and social constraints, and make supportive commitments over time: shifting design from rigid health ideals to negotiated guidance that support their emotional well-being.

In sum, to protect their emotional health, teens pushed back against technological expectations of optimizing health, and designed technologies to control **when and where** reflections and reminders should happen. Decisions of where to keep the “Future Self Mirror” were closely tied to how and when reflection might best occur. Locations associated with food—such as the pantry (G2P1), the fridge (G2P3), and the dining room (G9P2)—were chosen because these are points of daily decision-making around eating, where the mirror could prompt users to pause and consider nutritional choices or health goals. Fitness-related spaces (G2P2) allowed teens to imagine reflection surfacing during moments of exercises, encouraging them to connect immediate effort with future outcomes.

4.2 Protecting Human Experiences in the Direction of Convenience and Efficiency

Teens welcomed speed and automation in food-making machines for routine chores, framing efficiency as essential in the context of their busy lives, but they did not want automation to eliminate cooking as a source of creativity, family care, and culture. They agreed that machines can do some meal prep, but people should decide, finish, and give meaning to food.

4.2.1 Technology norm: Efficiency and automation in food making.

Time-saving and convenient food making. Teens with little time for meals, sought to save time (G1P1, G1P2, G9P3): “My days are busy, so when I pack my own lunch, I make it quickly and don’t like it much...time is important.” (G1P1). Therefore, they turned to technologies to accelerate food making, expecting technologies to simplify and speed up the process of preparation and eating (G2, G1, G5, G4, G7). Teens imagined machines reducing cooking

time to seconds and proposed concepts ranging from 3D-printing devices that assemble dishes on demand to cartridge-based units that dispense ready meals at the press of a button. Their design ideas showed that speed, convenience, and predictability are important considerations.

Automated food process. Teens imagined that food-making machines would be brain-computer interfaces, dispensing food directly based on people’s thoughts. In their speculation, users place their finger on the sensor of the machine, focus their thought on the food item they want, “and then it (the food machine) is able to connect to your brain, tell what you’re thinking, and then the food will come out” (G5P2) (See Figure 7 Left), “[I press the button] then I would imagine a picture of chili paneer that looks really good, and then I would think I want it medium spice, and then it it would read the waves in my brain.”

Despite the convenience, the automation of food in the family space could have negative implications. For example, food machines could allow younger children to overeat and have unhealthy snacks. Teens imagined device-mediated forms of parental control over healthy eating, where parents could use features like “Face ID” or “Touch ID” to restrict access to unhealthy foods as a form of guidance. For instance, G4P1 playfully reimaged “Face ID” as requiring parents to “stare into the machine’s eyes” before unlocking certain foods for their child (see Figure 7 Middle and Right).

4.2.2 Teens’ negotiated stance: Being cared for and having agency.

While teens imagined technology making eating more efficient and convenient, they drew boundaries around meals, noting the importance of culture, emotion, and care (G4, G7, G9). For these foods, convenience was deliberately constrained: slower, family-made preparation was preferable because it carried meaning that efficiency could not replace. They also insisted on human-in-the-loop controls of making food, and room to decide what they are eating.

Care in food. For participants, eating carried stories, memories, and bonds. They worried machines could flatten these relational layers and erode the human experience of eating food made by loved

Negotiation Companion - G5P2

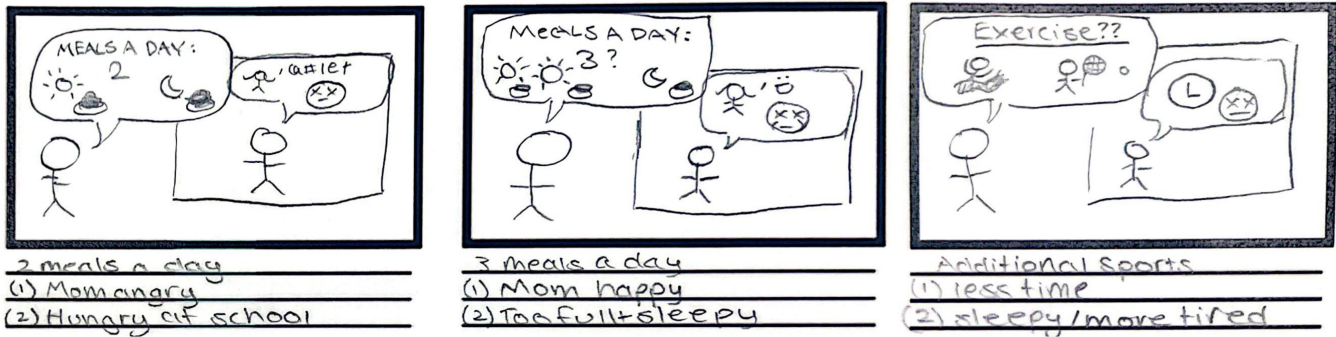


Figure 6: Negotiation Companion by G6P2: A narrative story where the protagonist wanted health technologies to negotiate and clarify with him—Boy: What if I only eat two meals a day? Mirror: Your mom will be angry at you. Plus, you will be hungry at school. Boy: Fine. What if I have three meals? Mirror: Mom will be happy, but you will be too full and feel sleepy. Boy: What if I played more sports? Mirror: Good! But you will have less time [for other tasks], and you will feel sleepy and be more tired.

Brain-to-machine Control - G5



Face ID Food Machines - G4



Figure 7: Left: Brain-to-machine Control of food selection allows users to hold a finger to the sensor, think of a food item, focus on it, and receive it from the food machine (by G5P2). **Middle and Right:** With children's misuse in mind, "Face ID" food machines allow parental control over certain food items (G4P1 and G4P2).

ones. They set a boundary between what could be made and what cannot—emphasizing that machines should **not** make/replicate home foods, no matter how efficient and convenient: "Some foods should be banned from being machine-generated, like 'home foods'—it should not be cooking grandma's ratatouille." (G9P3). Food was also a vessel of familial love and connection, and its meaning lay in the act of sharing with specific people. As G9P2 explained: "If I really like grandma's birthday pasta or [my friend]'s mom's pasta, I should go ask her for it. It has [an] emotion and story behind it. But if it's a restaurant like McDonald's making their 10-piece nuggets, there's no story there." (G9P2).

Although being away from home and craving home meals may justify machine-made food, our teens thought the machine would remain an imperfect stand-in: "Should we make an exception, where if you're in a different country you can make it for yourself? I think you could try, but it wouldn't taste exactly the same. Maybe 80% similar" (G9P2). They extended this thought to a fear of erosion to family time and family food experiences: "If everyone has one

[food making machine], food culture will die. No more grandma's food... Food is part of culture. Machines can't replicate those memories" (G4P1).

Human-in-the-loop Eating Journey. Teens argued that humans should remain involved at multiple levels of food experiences, even when technologies could easily take over. Even if machines could dispense fully personalized meals, participants insisted on deciding how involved they are in making food. Fundamentally, cooking was described as a creative pastime some of the participants did not want to relinquish: "I would just have [the machine] make the boring foods (like salad) because I actually like cooking and baking." (G8P1), sharing how baking for her friends for events is important and enjoyable for her and should not be taken away by machines.

Even in an imagined world where all agreed that capsuled food would exist, participants wanted to see real food ingredients go into the machine (G7) (to "see what goes in"). For some, growing their ingredients is non-negotiable (G1). Desiring even more human

effort in making food, at times, they even wanted their machines to only edit and customize “fully made dishes” (G9) even as they imagine a future where overly simplified food processes and capsuled nutrients are common.

Beyond eating, teens emphasized the necessity of parental care and guidance in their healthy-eating journeys. While initially thinking about lockable technologies like *FaceID* to restrict unhealthy food from children—“*Maybe it needs FaceID or a lock to control it*” (G4P2) (as mentioned in 4.2.1) they quickly turned back to the idea that parents should play a direct role in keeping children safe, without tech: “*Or parents just teach their kids to stay away (from unhealthy foods), or [that they should not play] with knives or stoves*” (G4P1). Parental controls, when used, should support teens in developing their healthy eating goals (G2, G3, G5). While technologies could be helpful, their parents’ opinion would still be valued more: “*I’ll follow the mirror when it feels worthwhile, but if my parents want otherwise, I’d do as my family says*.” (G3P3).

4.3 Protecting Food Access, Privacy, and Sustainability in a Techno-Capitalist System

While accepting of the access of food and related services and technologies are layered according to price and convenience, and understanding that food technologies would need to make a profit, teens nonetheless advocated for protecting equality (everyone should have access to food) and privacy protection. They agreed that good food services and products would cost more, yet insisted that such systems must still protect everyone’s basic need for food. They were expecting popularized and ubiquitous food technologies, but were convening that surveillance concerns should be raised. Finally, they think technologies would consume excessive energy, but negotiated for ways to achieve sustainability.

4.3.1 Technology norm: commercialization, ubiquity, and energy consuming.

Tiered pricing models for food, services, and products. Teens anticipated future food technologies would maximize profit through tiered service packages. Such food machines would operate on subscription models where higher, most costly tiers of service were tied to food quality, putting pressures on users to upgrade (G8). These expectations stem from our teens’ daily experiences with commercial systems, such as streaming services, gaming platforms, and app ecosystems where essential features are restricted or ad-supported unless users pay for premium access. In several designs from our workshops (e.g., G9P1’s mirror), advertisements appeared as unavoidable overlays (see Figure 8), and teens expressed concerns that companies would prioritize ad revenue over user well-being—for instance, one predicted that fast-food sponsorships would influence the food options offered and promotional content would pervade all interactions on future devices. One teen cynically described this as “*nature of the product since companies want money*” (G9P1) (see Figure 8). Putting their capitalist hat on, G9P2 noted, “*You’d have to think about subscriptions. If you want unlimited supply [of food from the food machine], you pay the big bucks.*”

Conversely, in this tiered service model, G8P1 and G8P2 also imagined the most affordable food machines generating “bland-tasting” food that meets the minimum requirement of necessary

nutrients. Flavorful and desirable foods, on the other hand, would be locked behind more expensive models (see Figure 9). This scenario reflected teens’ expectations that access tiers and food quality would be connected.

In some of their fictions, both the Future Self Mirror and Magic Food Machines were imagined as high-cost consumer products. These machines signified luxury, as G9P2 explained about ownership of food machines: “*if you can afford it, it’s cool to have. You won’t really ‘need’ this machine, but it will be a sign of wealth and luxury*” (G9P2). G9P2 further stated that only a certain class of people will benefit from powerful technology that generate food (the Magic Food Machine): “*[the machine] price will be solid, like, at least six figure... people in nice six-figure jobs—now they don’t have to cook at home anymore, so they’d benefit [from the food-generating machine]*” (G9P1 and G9P2).

Everything, Everywhere: Systemically ubiquitous. Teens also imagined future food technologies becoming indispensable and ubiquitous, mirroring the trajectory of smartphones or AI tools today (G3, G8, G9). Food-generating “magical” technology would evolve from luxury devices (as described in 4.3.1) to universal necessities: “*It will start off elite, but like iPhone, [once popularized,] everyone would have to use it*” (G4P1).

Following this logic, these technologies would be vastly interconnected. G5P1 and G5P2 speculated on food-generating stations scattered across the city, “*like gas stations*,” where anyone could approach a vending-machine-like interface, connect with the machine, enter a prompt, and receive freshly generated food.

Energy Consumption and Excessive Use of Resources. Teens also expected food technologies to demand significant energy and resources. They compared their imagined systems to the environmental footprint of contemporary AI products, and predicted overproduction, food waste, and high energy consumption as natural consequences of large-scale adoption. For instance, G4P1 imagined food-generating machines consuming environmental resources akin to today’s contemporary AI systems: “*Like AI new tech will use huge amounts of water and energy*” (G4P1). Some speculated that early versions of these devices—like many new technologies—would be inefficient, producing excess or imperfect food before the systems stabilized, “*When it comes out, I feel like people would just keep on generating more and more food, more than they could eat, and just throw it out.*” (G4P2).

4.3.2 Teens’ negotiated stance: Equitable access, negotiating privacy, and sustainability.

Equitable food access within consumerism. In our workshops, while teens agreed that “*high-end food like caviar shouldn’t be easy to get*” (G2P1), they argued that “*essential foods should be accessible*” (G2P2). To make food accessible, G8P2 suggested a baseline food machine subscription as low as \$15 USD per month. Their food-printing Magic Food Machine was designed with different tiers: an affordable base model that could print molecular components such as carbohydrates, proteins, and fats, with options for more advanced versions to produce complete meals with flavors. Groups G2 and G5 also had requirements for the machines to provide at least bread and water—basic food items for all—acknowledging that food is a universal basic human necessity, “*because food is a basic*

Advertisements on reflection technologies - G9P1

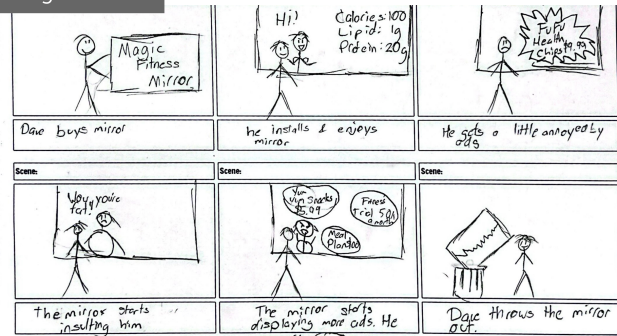


Figure 8: Ads Made Me Break Mirror by G9P1: A storyboard about a character named Dave, who initially purchased and enjoyed using a smart mirror. Over time, however, the ads on the companion app became increasingly intrusive. When he stopped watching the ads, the mirror itself began insulting him and displaying harmful versions of his reflection. This relentless negative feedback drove Dave into distress, eventually leading him to destroy and discard the mirror.

human necessity, right? Food and water should be free for people.” (G5P2).

On a higher level, teens were concerned with the impacts of aforementioned class disparities caused by future food machines. G9P2 noted that lower-income workers in grocery or retail roles would face heightened job loss. Others, like G4P2, warned that computerized food production and its use in business could displace those relying on farming, small businesses, and service jobs: “when you digitalize that ... it takes away those job opportunities for so many.”

Teens argued that future food technologies should first serve the public good. They envisioned these machines being introduced through shared, collective access before eventually becoming personal devices (G8, G9). They suggested that institutions serving public needs—such as health clinics and schools—should have priority access to food machines and Future Self Mirrors: “It would be useful for [students at] schools if they could invest in one” (G9P1). For high schoolers, this was tied to the importance of ensuring that all students could have access to nutritious lunches during the school day, especially when people have different needs of food (the public high schools of our teen participants provide free lunches by the state government). Similarly, G8P2 imagined that doctors’ offices would be the first to adopt and offer access to food technologies, and then later made more affordable and widespread.

Negotiating Protection of Privacy Through Food Technologies. With the eventual pervasiveness of future food technologies, teens brought up concerns of surveillance from the government and corporations and strove to protect their privacy. Teens suggested that—much like other technologies that become everyday objects that people rely heavily on—food making technologies could insidiously evolve into naturalized forms of surveillance. One teen drew a direct parallel to social media as an everyday product they “can’t live without,” noting: “You know how we have social media and stuff, right? What’s stopping the government and companies from looking at your social media posts and being like, ‘Oh, let’s track this person?’” (G5P1). In the same breath that teens expressed contemporary fears that the government would access their social media

data and learn everything about them, they worried about the governance of emerging data infrastructures around food—especially in their speculative scenarios where “brainwaves or private thoughts could become inputs for food generation.”

To counteract such risks, teens expressed that future technologies would emphasize the need for humans to develop skills to protect themselves from privacy invasion and surveillance. For instance, G5P2 imagined that humans would be required to undergo mandatory training—“take a course”—before interacting with interfaces such as brain-input technologies. Such training, they suggested, would help individuals regulate their thoughts and navigate these systems safely: “They (the government or company) might control us... but at least we should know how to use it properly, so that way we can protect our private thoughts and our brain.” This reflects a privacy stance built around self-defense and competency, not just in controlling settings, mirroring their everyday experiences of navigating safety and privacy already.

Negotiating Sustainable Food Futures. Finally, teens imagined ways to achieve food sustainability with food technologies. Teens worried that “if people can make 10 dishes a day but [are] only eating three, they’re throwing out the rest.” (G7P2). Similarly, G7P1 enforced certain rules in their design so that one would not go over four meals a day to prevent food waste. They also mentioned a guardrail to prevent food waste: “it would ‘donate’ surplus food and prohibit re-sale of food items to prevent owners of this technology from over-generating food for profit” (G9P2).

Still others envisioned technological advancements as tools for tackling food waste. G4P2 imagined a recycling and cleaning system derived from leftover foods, and G4P1 created a machine that converts natural molecules into edible foods that can be recycled into a built-in funnel.

5 Discussion

Our design fiction workshops identify three ways teens envision future technologies to support health and eating: First, while teens assumed future technologies would aim to optimize healthy eating, they stressed that eating is connected with complex emotional



Figure 9: On the *left* is a branded “Samsung” 3D food-printer machine, designed as a base model, upgradable with a higher price. In the *middle* and on the *right* are a basic printer model that still allow users to print food from proteins and other macronutrients in a printer cartridge, though with fewer options for spices and flavor customization. These entry-level versions were imagined as highly affordable and thus widely accessible, while also being scalable in their material use and operation.

needs that must also be addressed. Second, although efficiency and automation were expected features of food technologies, teens emphasized that these should not replace the human experiences of making food and building healthy practices with family. Finally, even as technologies were taken as normalized within capitalist systems, teens voiced aspirations for designs that would reduce harm and promote more equitable food futures. Across these visions, we see tensions between what teens thought technologies would become—shaped by existing societal and economic norms—and the futures they hoped for, rooted in values such as sustainability, care, and fairness.

We now turn to three discussion directions: (1) By examining how teens articulated their own design considerations for reflective health technology, we show that reflection should be bounded and negotiated, using “absence” in temporal, spatial, and informational aspects as an important affordance of protection of mood, eating practices, and identity. (2) We highlight a design space at the intersection of reflection and play in food and health technologies. Food technologies for teens should not just be tools of control or tracking, but as sites of sensory delight, family care, and playful reflection tied to identity experimentation. (3) We reflect on the distinctive aspects our speculative workshop design surfaced, particularly how its structure enabled teens to “embrace the monster” by negotiating rather than rejecting the systemic pressures embedded in food technologies.

5.1 Reflecting on Reflection Technologies for Teens

Our findings reveal that teens construct reflection not as a constant or ubiquitous process, but as a negotiated, situated practice shaped by when, where, and how they choose to engage with health technologies. From the Mirror prompt, we learned how teens emphasized temporal control (choosing when to reflect), spatial placement (embedding reflection in decision-making sites like fridges at home), and information display (what they want to know) in technologies that support reflection on health. While reflection is always contextually situated, prior personal informatics and health-reflection

HCI work has often implicitly assumed that users will reflect continuously or ubiquitously once data is collected and visualized [15]. Teens in our study made these boundaries explicit, emphasizing reflection as something to be chosen and negotiated, rather than an automatic byproduct of having data available. Furthermore, we also argue that the room for negotiation in health for teens is very important, especially when setting goals and supporting reflection as personal, non-performative activities.

5.1.1 Constructing Absence of Reflection as an Affordance. HCI and CSCW research conceptualizes affordances as relational and situated rather than fixed properties of technologies—that is, affordances emerge from the interaction between people, technologies, and contexts, and shift depending on users’ goals and circumstances [36, 87]. In parallel, food practices are understood not as isolated acts but as embedded in everyday routines and material infrastructures, such as meal timing, domestic spaces, and social arrangements [32].

Taking this conceptualization further, teen participants sought affordances in reflective technologies that would protect their emotional well-being from over-optimization and body image anxieties.

In particular, we find that teens frame *absence of reflection* as an affordance in terms of time, space, and information. Temporally, they did not desire technologies to help them reflect all the time; spatially, they did not want technologies to be everywhere; and information-wise, they did not need to know everything. Constructing absence as an affordance in their design creations protected their mood, eating practices, and identity. We describe below the design implications of seeking absence as an affordance for future technologies for teens:

Support refusal and deferral in time as a core interaction logic. Health-tracking tools should support explicit boundary-setting, such as blocking or deferring prompts for reflections during certain periods. By providing these options, teens can reposition tracking as a voluntary practice, enabling reflection to occur when they feel ready rather than when the system demands it. It also allows teens to protect themselves from being preoccupied with their body image or unwanted interactions.

Tailor reflection to the spatial and social contexts. Teens preferred artifacts to be located in spaces that fit naturally into relevant, everyday routines. For instance, they imagined the mirror technology in the home, positioned in spaces already tied to fitness (e.g., home gyms) or eating (e.g., on the fridge or pantry door). In these spaces where teens feel most comfortable engaging deeply with health information, systems can support richer and more embodied reflection, for example, through large-format displays that visualize changes in the body, voice- or audio-based reflective prompts, or interactive mirrors that allow teens to talk through thoughts or goals in private. At the same time, teens in our workshops used mobile devices mainly for brief emotional support rather than sustained reflection. This suggests an opportunity for future designs to explore lightweight companion tools that offer subtle, socially appropriate emotional support without prompting deeper interaction. For example, at school, a socially dense environment, reflection should shift toward quick, unobtrusive interactions: subtle affirmations to boost confidence in achieving goals, quiet on-demand summaries, or glanceable widgets that withhold detailed body data and allow deferred reflection at home.

Redefine information as supportive, not prescriptive. Teens challenged the informational logics underpinning many health technologies. In contrast to prior emphasis in personal informatics with “knowing” as a pathway to “improvement” [88], participants in our study questioned whether an optimized future self was even desirable. They noted the risk of falling into rumination if too fixated on an optimized health simulation. Instead, they emphasized forms of hedonic and emotional well-being—enjoying food, feeling cared for, and finding comfort—which, at times, outweighed nutritional or fitness goals. Instead of aggressively pushing users toward an optimized future self, technologies should present information in gentle, affirming ways—framing health in terms of enjoyment, comfort, and care, alongside fitness or nutrition goals (e.g., still being allowed to eat tasty food even when working towards a healthy lifestyle). For teens, this balance could prevent harm from prescriptive standards while still offering guidance when desired.

The construction of absence as an affordance in temporal, spatial, and informational terms build upon past observation of adolescents negotiating self-tracking [56] and tools can both inspire and pressure youth [79]. Previous studies have also documented breakdowns, burdens, and refusals of self-tracking when such practices become intrusive or emotionally taxing [48, 102]. Research on non-use and refusal [12, 103] similarly highlights how disengagement from technology can be strategic, protective, and identity-affirming. This is especially important for teens with or at risk for eating disorders, whose symptoms often emerge gradually through escalating cycles of monitoring, comparison, and restriction [112]. Designing for brief, supportive pauses in reflection on food tracking can help teens notice when their tracking behaviors begin to feel stressful or compulsive, offering an opportunity to interrupt these early risk trajectories.

5.1.2 Making Room for Negotiation in Reflection. Room for negotiation was highlighted as a key feature of reflection technologies by teen participants in this study. For example, in the Future Self Mirror prompt, teens negotiated what healthy eating meant in relation to their everyday lives. In the Magic Food Machine prompt, they

negotiated what could be excluded from food experiences and what could not. They insisted that food should be tailored to their taste, and that tasty but less healthy food is a must to remain emotionally well. In a broader sense, teens are negotiating for “soft” goal-setting that is reasonable to act on, and reflection as a private and personal activity, with space for technologies to serve as social companions.

Teens negotiated **“soft” goal-settings** that were reflexive and not purely outcome-oriented. Prior work on personal informatics has raised concerns about rumination and negative affect when users fail to meet rigid goals, or when tracking technologies impose hegemonic health standards on users, risking persuasive anxiety [64]. We found that teens deliberately negotiated soft, realistic goals that accounted for emotional well-being. For example, they called for setting a reasonable timeline of change and carefully weighing the emotional cost of not reaching goals. Their strategies foreground emotional regulation as an integral part of reflection.

Teens also negotiated reflection as a **personal activity, not performative or social**. Teens in our study strongly resisted default sharing or social media-like visibility, citing concerns about comparison and empathy erosion, which are well-mentioned in previous literature [65, 116]. In our study, technologies were described as companions—agents to talk with, confide in, or treat as nonjudgmental negotiation partners. Prior HCI work has examined social companions in food experience, such as by simulating dining partners with **artificial commensal companions** [54], encouraging the positive interactions with **celebratory technologies** [63], and enhancing solo eating with providing presence [86]. In our study, we did not see the magic food machines spark inspiration for commensal companions for dining, whether they are stationary in the family homes or portable. In the mirror design fictions, by contrast, teens depicted companion-like mirrors that can support not only empathy and continuity in their wellness journey, but more importantly, help them shape their own goals and definitions of healthy eating.

5.2 The “Human” in Food Experiences: Protecting Care and Culture, and Including Play

HCI research for children and teenagers often considers food tech through the lens of parental control or health tracking (e.g., [26, 74]). Our findings suggest broadening this lens: in our workshops, teens envisioned a future with portable food machines as loci for self-determination in health, countering both parental oversight and social isolation. Participants recognized that family meals are culturally significant sites of care and connection [29, 96] and were wary that food-related technologies could displace these practices. Rather than optimizing on efficiency or nutrition alone, teens valued technology’s ability to carry affective meaning, expressing care, love, and shared experiences—especially in familial contexts.

5.2.1 Family and Love. Although adolescence is defined as a developmental stage of increasing independence from parents, our findings suggest teens do not necessarily aspire to more autonomy at the expense of parental involvement. Rather, participants valued parental guidance and shared routines (e.g., cooking together,

regulating food portions, learning food practices) as essential components of developing healthy eating habits. Teens pragmatically worried that automated systems tracking, recommending, or deciding on their behalf could displace the relational aspects of parental care that they value.

When discussing parent–teen dynamics, we found that teens did not desire strict privacy from parents in their home. Instead, they described a conditional trust: parents were generally seen as more helpful than harmful in shaping healthy behaviors, and thus parental access to food and health data was acceptable. At the same time, teens acknowledged situations where they preferred privacy—when eating unhealthy foods that elicited guilt or shame, internalized in part by earlier experiences of parental scolding. To support teens in balancing these tensions, systems could share abstract, high-level summaries instead of detailed data with parents. For example, instead of sharing caloric counts or “good/bad food” categories, systems can provide high-level signals, such as, “*Mostly regular meals this week*,” or “*Trying new foods*.” Drawing on parenting approaches promoting empathetic partnerships [108], especially with teens with more autonomy and familiarity with technologies [53], systems could prompt parents to engage in empathetic conversations rather than discipline, normalizing occasional indulgence, and acknowledging emotional needs. Such designs would help sustain trust and reduce the emotional burden teens associate with being monitored.

5.2.2 Teens’ Food “Play” in Sensory Delight and Building of Identity. Human-centered Play, a recurring mode of engagement for teens across our workshops, can potentially expand the design space for health technology for teens. Rather than approaching food and health technologies only as tools for discipline or optimization, teens consistently imagined playful futures: food machines that produced fantastical meals, mirrors that joked with them or acted as companions, scenarios where enjoyment of food was highlighted alongside nutrition, and fun moments when trying out different versions of self through the mirror. These speculative designs underscored that for teens, food and thinking about food practices were not only a matter of self-control but also of fun, imagination, and identity building, echoing Grimes and Harper’s “celebratory technology” [63]. Play, then, became both a method of expressing values in our workshops and a design principle for how health technologies might better resonate with teens’ lived experiences.

Play as Fantasy, Sensory Delight, and Exploration with Food. Teens in our study approached food as play, rooted in fantasy, sensory delight, and imaginative interactions with their Future Self Mirror stories and Magic Food Machines. Their ideas drew on familiar media references (e.g., the *Star Trek* Replicator⁵, sentient foods from *Cloudy with a Chance of Meatballs*⁶) and on TikTok’s hyper-sensory trends such as “AI lava,” “glass foods⁷,” and “ramen

waves⁸”—characterized by whimsical textures, ASMR-like sounds, bold visuals, and experimental flavors. Teens found these content with vivid depictions and often impossible tastes and textures highly engaging and said these visuals expanded their imaginative sense of how foods might taste or feel. These influences framed food as a multisensory spectacle rather than mere sustenance, highlighting sensory pleasure and play in teens’ everyday food engagement. Research shows that playful approaches to eating can foster joy and multisensory involvement [3], while digitally mediated food practices offer distinct opportunities for hedonism, sensory stimulation, and novel forms of enjoyment [49]. Contemporary playful generative AI developments around food include Google’s mood-responsive Food Coach that crafts humorous or affect-driven recipes [107] and NEC’s AI-assisted Romance Bread that experiments with flavors intended to evoke emotional responses [115]. These examples illustrate a broader space of food experience design as play.

Designs of food technologies might leverage teens’ attraction to explorative, AI-generated food content to support curiosity-driven learning in food practices and health. Generative AI content circulates around physically impossible food content, which could redefine our sensory appeal [110]. It offers an audio-visual immersive stimulation that seems to draw teenagers’ curiosity and rapid engagement, potentially offering a multisensory opportunity for learning about food. For example, food technologies can adopt personalized food videos to help teens immerse in and familiarize with healthy foods and ease anxieties or unfamiliarity around ingredients by letting them experiment virtually before trying them in real life. However, while viewing such AI-generated videos was popular among teens, the increasing realism of AI-generated foods also raises safety considerations: fictional recipes, impossible cooking steps, or hyper-sensory depictions may blur boundaries between entertainment and feasible practice [130]. Future designs should recognize this dual influence, supporting sensory exploration while addressing the risks of misinformation and overly idealized or impossible food portrayals.

Play also shaped the look and feel [70] teens imagined with food-making technologies. They emphasized playful engagement: peeling off stickers to activate choices of food made from the machine, collecting water particles to transform foods, or customizing the machines’ appearances (adding googly eyes) and even their verbal interaction styles to design for a companion’s “personality.” These interactions reflected a desire for tactile, sensory, and emotionally warm engagement with technologies [76]. Past design explorations used playfulness in an eating utensil to encourage mindful eating [83] and in a pet-shaped companion to nudge healthier snacking behaviors [80]. To align with teens’ developmental needs on exploration (to build autonomy and more sustainable, self-directed eating practices), features such as gentle sensory prompts, companion-like animations, or recipe suggestions that respond to texture and aroma preferences could transform routine cooking into opportunities for low-stakes experimentation around food.

Play as Identity Experiments. Developmental psychology positions adolescence as an important stage of identity exploration [111]. For the teens in our study, food, health, and self-presentation

⁵The Replicator (*Star Trek*) is a fictional technology that instantly produces food, tools, or other objects by rearranging matter at the atomic level [128].

⁶*Cloudy with a Chance of Meatballs* (2009). An animated film in which a young inventor creates a machine that turns water into food, causing giant meals to rain from the sky [127].

⁷“Glass food” is a TikTok aesthetic trend in which everyday foods are depicted as translucent, hyper-smooth, and glossy—resembling glass or crystal through filters, editing, or artificial materials.

⁸“Ramen waves” is a TikTok visual trend often created with generative AI, in which masses of instant ramen noodles are depicted as undulating ocean waves.

were tightly intertwined. Their speculative technologies became playful spaces for exploring who they might become. For instance, they imagined the Future Mirror as a way to experiment with different future selves—connecting dietary choices to changes in body shape, clothing style, and fashion-based self-expression. They similarly connected nutrition to skincare and facial appearance, treating food as something that shapes how they look and, in turn, how they want to be seen. In this sense, the Future Mirror was not just about health but about experimenting with aspirational identities, while the food-generating machines offered tools for exploring cultural references, nostalgic cues, and imagined futures.

Past HCI and CSCW work examined how adolescents use digital technologies for identity exploration on social media and virtual worlds [23]. Immersive and playful platforms like social VR also attract teens for their rich interactive and creative affordances, providing embodied avenues for self-expression [13, 75]. Teens in our study engaged in identity play through reflective technologies: using speculative designs to test out how different “future selves” might be expressed and performed. These explorations extended beyond food practices to encompass broader life trajectories—for example, imagining how fashion on their future selves might shift because they move to a city they aspired to live in, or how future versions of themselves would balance health with pleasure and self-expression (“*could be healthy-looking but not actually happy*”). Reflection thus became a site not only for managing diet but also for playfully experimenting with possible identities and life narratives.

5.3 Methodological Reflections: Embracing the “Monster” in Food Futures

Our study showed that teenagers surface ethical concerns and frame technology-mediated food futures in ways that directly intersect with broad, systemic issues. Rather than interpreting these insights as evidence of either solutionism or anti-solutionism, we argue for a more practice-oriented reading of teens’ contributions—one that attends to how they negotiate technological possibilities under the constraints of everyday life. We argue for a more practice-oriented approach to understand how teens negotiate technological possibilities within the social, emotional, and normative constraints that shape their everyday lives.

In our study, teens do not fit neatly into embracing or rejecting technology; instead, they negotiate with techno-capitalism around food. Teen participants grounded their stories in their reality of lack of time with tight schedules, academic pressure, and lived experiences in a capitalistic world, focusing on practical solutions with a few noted pitfalls. They embrace agonistic discourse and pragmatic negotiation, offering a middle course between resistance and acceptance. We surmise that this pragmatism is tied to the **emotional** and **existential** anxieties of modern teenage life [16]. Participants repeatedly expressed a lack of time with tight schedules. This reality directly shapes their visions for food technology: they wanted solutions that were convenient yet noninvasive. Their relationship with food, a desire for traditional, familial, analogue experiences mixed with the pressures of a fast-paced world, needs an intentional approach beyond simple solutions.

The de facto HCI scenario employs a “monster” metaphor to represent a problem or limitations that can be overcome with a

solutionist mindset [19]. To counteract, some design fictions resist solutionism and instead seek to dismantle the current system or highlight their flaws without necessarily offering fixes [20]. Our methods such as that of Magic Machine Making similarly emphasize questioning and critical reflection rather than producing direct solutions [7, 8]. However, our findings reveal a third orientation. Our participants sought to live and negotiate with the proposed solutions despite being products of the very consumerist system they inhabit. This approach is neither purely anti-solutionist nor purely solutionist, but a discursive effort to “**embrace the monster**”, finding a middle ground where they can both critique and engage with the technological and social systems around them. This aligns with the concept of adversarial design outlined by DiSalvo [39] and outcomes of critical design by Bardzell et al. [11] in that teenagers demonstrated openness to the political dimensions of technology while working within the boundaries of technocapitalism [45]. Teens recognized capitalism as a dominant force in their lives—something neither fully solvable nor fully escapable, but workable in partial, pragmatic ways, a mindset that aligns with Gibson-Graham [60].

Unlike prior work highlighting parent–child tensions [18] or adolescent indifference to technology problems [62, 85], our participants sought to “tame” flaws, openly articulating harms while still desiring direct interaction with food technologies. Their pragmatic willingness to negotiate risks such as surveillance or addictive content [130] positions teens as the protagonist in envisioning technological futures. For HCI and human–food interaction, this highlights the value of speculative participatory methods for surfacing paradoxical, context-specific insights and reframing food technologies as sites of negotiation rather than fixed solutions.

Collectively, teens’ willingness to critique systemic flaws while still imagining workable ways of living with imperfect technologies emerged not only from their lived experiences but also from the structure of our dual-mode speculative workshop. By sequencing design fiction storyboarding (scenario creation) with hands-on Magic Machine making (physical prototyping), we created a progression from reflective grounding to imaginative exploration to embodied consequence. This allowed teens to connect micro-, meso-, and macro-level ideations with the practical realities of using and living with food technologies. Furthermore, food-related decisions are emotionally charged and can evoke hesitation toward unfamiliar food technologies [84]. Our dual-mode workshop—from narrative reflection to hands-on speculative making—appeared to soften this apprehension by giving teens space to imagine, test, and negotiate these technologies on their own terms. Methodologically, our adaptation of design fiction, allowing interpretive freedom instead of anti-solutionist priming [7, 8], demonstrates how speculative workshops can elicit negotiated, practice-oriented futures. These insights suggest that future teen-centered workshops across domains can adopt similar strategies, integrating multimodal and fictional framework to support dimensional speculation.

6 Limitations

This study offers insights into how teenagers envision and engage with future food technologies; however, our findings should be interpreted within the particular contexts in which they were generated. Our participant group consisted primarily of U.S. teens in

the summer of 2025, many of whom had strong interest in science and digital technologies due to recruitment through a research-focused summer program and local outreach in the Bay Area—a region with a dense concentration of technology firms and startup culture. As such, their perspectives may differ from those of teens in other cultural contexts, with different food practices, socioeconomic conditions, or levels of technological exposure.

Our sample also consisted largely of older teens (approximately 15–18 years old), a stage associated with greater autonomy and digital fluency, which may shape their comfort in discussing topics such as privacy, body image, and health reflection. Perspectives from younger teenagers, who experience different forms of parental oversight and social pressures, may reveal additional needs and concerns.

Finally, because we did not systematically collect information about household structures, our findings may not capture the full range of family dynamics—including separated households, or other caregiving arrangements—that influence teens’ everyday food and health practices. Future work should engage teens across these contexts to better understand how diverse forms of support shape their interactions with food, health, and technology.

7 Conclusion

This paper offers the HCI community new insights into how teens imagine the futures of food and health technologies through design fiction. For our participants, eating was not only a matter of nutrition or optimization but also deeply entangled with emotions, family relationships, and identity. While teens expected efficiency and automation to characterize future food technologies, they also highlighted the importance of preserving human experiences of making, sharing, and caring around food. Even as they assumed technologies would operate within capitalist systems, being ubiquitous and consuming energy, they articulated aspirations for designs that enable more equitable food futures, protect privacy, and promote sustainability.

From these workshops, we advance three contributions. First, we propose temporal, spatial, and informational forms of “absence” as protective affordances for mood, eating practices, and identity. Second, we broaden the framing of food technologies for teens—not merely as tools for control or tracking, but as sites of fantasy, sensory delight, playful reflection, and family care, opening up design spaces at the intersection of reflection and play. Third, our methodological contribution lies in demonstrating how our design fiction workshop—with narrative and material speculation—can elicit grounded sociotechnical imaginaries from teens.

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References

- [1] Amna Ajmal et al. 2019. The impact of body image on self-esteem in adolescents. *Clinical and Counselling Psychology Review* 1, 1 (2019), 44–54.
- [2] Mamta Akter, Amy J. Godfrey, Jess Kropczynski, Heather R. Lipford, and Pamela J. Wisniewski. 2022. From Parental Control to Joint Family Oversight: Can Parents and Teens Manage Mobile Online Safety and Privacy as Equals? *Proc. ACM Hum.-Comput. Interact.* 6, CSCW1, Article 57 (April 2022), 28 pages. doi:10.1145/3512904
- [3] Ferran Altarriba Bertran, Jared Duval, Katherine Isbister, Danielle Wilde, Elena Márquez Segura, Oscar García Pañella, and Laia Badal León. 2019. Chasing Play Potentials in Food Culture to Inspire Technology Design. In *Extended Abstracts of the Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts (Barcelona, Spain) (CHI PLAY '19 Extended Abstracts)*. Association for Computing Machinery, New York, NY, USA, 829–834. doi:10.1145/3341215.3349586
- [4] Ferran Altarriba Bertran, Samvid Jhaveri, Rosa Lutz, Katherine Isbister, and Danielle Wilde. 2019. Making Sense of Human-Food Interaction. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland UK) (CHI '19). Association for Computing Machinery, New York, NY, USA, 1–13. doi:10.1145/3290605.3300908
- [5] Ferran Altarriba Bertran, Samvid Jhaveri, Rosa Lutz, Katherine Isbister, and Danielle Wilde. 2019. Making Sense of Human-Food Interaction. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland UK) (CHI '19). Association for Computing Machinery, New York, NY, USA, 1–13. doi:10.1145/3290605.3300908
- [6] Ferran Altarriba Bertran, Danielle Wilde, Ernő Berezvay, and Katherine Isbister. 2019. Playful human-food interaction research: State of the art and future directions. In *Proceedings of the Annual Symposium on Computer-Human Interaction in Play*. 225–237.
- [7] Kristina Andersen. 2013. Making magic machines. In *10th European Academy of Design Conference*.
- [8] Kristina Andersen and Ron Wakkary. 2019. The Magic Machine Workshops: Making Personal Design Knowledge. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland UK) (CHI '19). Association for Computing Machinery, New York, NY, USA, 1–13. doi:10.1145/3290605.3300342
- [9] Emily P. Backes and Richard J. Bonnie. 2019. *The Promise of Adolescence: Realizing Opportunity for All Youth*. National Academies Press, Washington, DC. <https://doi.org/10.17226/25388>
- [10] Melike Balkaya and Gökçe Elif Baykal. 2025. Exploring the Nexus of Technology and Food Practices in Young Adults: A Value-Sensitive Design Perspective towards Human-Food Interaction. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. 1–16.
- [11] Jeffrey Bardzell and Shaowen Bardzell. 2013. What is “critical” about critical design?. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Paris, France) (CHI '13). Association for Computing Machinery, New York, NY, USA, 3297–3306. doi:10.1145/2470654.2466451
- [12] Eric PS Baumer, Jenna Burrell, Morgan G Ames, Jed R Brubaker, and Paul Dourish. 2015. On the importance and implications of studying technology non-use. *interactions* 22, 2 (2015), 52–56.
- [13] Laura M Beals. 2010. Content creation in virtual worlds to support adolescent identity development. *New Directions for Youth Development* 2010, 128 (2010), 45–53.
- [14] Adam Bell and Katie Davis. 2016. Learning through participatory design: Designing digital badges for and with teens. In *Proceedings of the 15th international conference on interaction design and children*. 218–229.
- [15] Marit Bentvelzen, Pawel W. Woźniak, Pia S.F. Herbes, Evropi Stefanidi, and Jasmin Niess. 2022. Revisiting Reflection in HCI: Four Design Resources for Technologies that Support Reflection. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 6, 1, Article 2 (March 2022), 27 pages. doi:10.1145/3517233
- [16] Steven L Berman, Carl F Weems, and Timothy R Stickle. 2006. Existential anxiety in adolescents: Prevalence, structure, association with psychological symptoms and identity development. *Journal of youth and adolescence* 35, 3 (2006), 285–292.
- [17] Rohan Bhalla, Pinaz Tiwari, and Nimit Chowdhary. 2021. Digital natives leading the world: paragons and values of Generation Z. In *Generation Z marketing and management in tourism and hospitality: The future of the industry*. Springer, 3–23.
- [18] Lindsay Blackwell, Emma Gardiner, and Sarita Schoenebeck. 2016. Managing Expectations: Technology Tensions among Parents and Teens. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. ACM, San Francisco California USA, 1390–1401. doi:10.1145/2818048.2819928
- [19] Mark Blythe. 2017. Research Fiction: Storytelling, Plot and Design. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. ACM, Denver Colorado USA, 5400–5411. doi:10.1145/3025453.3026023

- [20] Mark Blythe, Kristina Andersen, Rachel Clarke, and Peter Wright. 2016. Anti-solutionist strategies: Seriously silly design fiction. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. 4968–4978.
- [21] Bas de Boer and Mailin Lemke. 2024. Insect consumption and aesthetic disgust: Using design fiction to imagine novel food experiences. *International Journal of Food Design* 9, 2 (2024), 245–265.
- [22] Carol Jo Boushey, Amelia J Harray, Deborah Anne Kerr, TusaRebecca E Schap, Stacey Paterson, Tanisha Aflague, Marc Bosch Ruiz, Ziad Ahmad, and Edward J Delp. 2015. How willing are adolescents to record their dietary intake? The mobile food record. *JMIR mHealth and uHealth* 3, 2 (2015), e4087.
- [23] Danah Boyd and Alice E Marwick. 2011. Social privacy in networked publics: Teens' attitudes, practices, and strategies. In *A decade in internet time: Symposium on the dynamics of the internet and society*. Elsevier, Philadelphia, PA, 29.
- [24] Virginia Braun and Victoria Clarke. 2021. Thematic analysis: A practical guide. (2021).
- [25] Chelsea P Butkowski, Travis L Dixon, and Kristopher Weeks. 2019. Body surveillance on Instagram: Examining the role of selfie feedback investment in young adult women's body image concerns. *Sex Roles* 81 (2019), 385–397.
- [26] Yoon Jeong Cha, Jiongyu Chen, Yasemin Gunal, Qiying Zhu, Mark W Newman, and Sun Young Park. 2025. Collaborative Health-Tracking Technologies for Children and Parents: A Review of Current Studies and Directions for Future Research. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 1038, 13 pages. doi:10.1145/3706598.3713596
- [27] EunJeong Cheon and Norman Makoto Su. 2018. Futuristic Autobiographies: Weaving Participant Narratives to Elicit Values Around Robots. In *Proceedings of the 2018 ACM/IEEE International Conference on Human-Robot Interaction (HRI '18)*. ACM, New York, NY, USA, 388–397. doi:10.1145/3171221.3171244
- [28] E. Chiodo, M. Aquila, and D. Gallo. 2018. EXPERIENCE DESIGN: STORYTELLING AND VISUAL NARRATIVES. In *ICERI2018 Proceedings (Seville, Spain) (11th annual International Conference of Education, Research and Innovation)*. IATED, 1971–1978. doi:10.21125/iceri.2018.1430
- [29] Jaz Hee-jeong Choi, Marcus Foth, and Greg Hearn. 2014. *Eat, cook, grow: Mixing human-computer interactions with human-food interactions*. MIT Press.
- [30] Sophia Choukas-Bradley, Savannah R Roberts, Anne J Maheux, and Jacqueline Nesi. 2022. The perfect storm: A developmental-sociocultural framework for the role of social media in adolescent girls' body image concerns and mental health. *Clinical child and family psychology review* 25, 4 (2022), 681–701.
- [31] Rachel Cohen, Toby Newton-John, and Amy Slater. 2018. 'Selfie'-objectification: The role of selfies in self-objectification and disordered eating in young women. *Computers in Human Behavior* 79 (2018), 68–74.
- [32] Rob Comber, Jettie Hoonhout, Aart van Halteren, Paula Moynihan, and Patrick Olivier. 2013. Food practices as situated action: exploring and designing for everyday food practices with households. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Paris, France) (CHI '13)*. Association for Computing Machinery, New York, NY, USA, 2457–2466. doi:10.1145/2470654.2481340
- [33] Angela M Craigie, Amelia A Lake, Sarah A Kelly, Ashley J Adamson, and John C Mathers. 2011. Tracking of obesity-related behaviours from childhood to adulthood: a systematic review. *Maturitas* 70, 3 (2011), 266–284.
- [34] Jillian Croll. 2005. Body image and adolescents. *Chest (in)* 40, 35 (2005), 50.
- [35] Jillian K. Croll, Dianne Neumark-Sztainer, and Mary Story. 2001. Healthy Eating: What Does It Mean to Adolescents? *Journal of Nutrition Education* 33, 4 (2001), 193–198. <https://linkinghub.elsevier.com/retrieve/pii/S1499404606600316>
- [36] Jenny L Davis and James B Chouinard. 2016. Theorizing affordances: From request to refuse. *Bulletin of science, technology & society* 36, 4 (2016), 241–248.
- [37] Treena Delormier, Katherine L Frohlich, and Louise Potvin. 2009. Food and eating as social practice—understanding eating patterns as social phenomena and implications for public health. *Sociology of health & illness* 31, 2 (2009), 215–228.
- [38] Annaleise Depper and P David Howe. 2017. Are we fit yet? English adolescent girls' experiences of health and fitness apps. *Health Sociology Review* 26, 1 (2017), 98–112.
- [39] Carl DiSalvo. 2012. *Adversarial Design*. The MIT Press.
- [40] Markéta Dolejšová, Hilary Davis, Ferran Altarriba Bertran, and Danielle Wilde. 2020. Feeding the futures of human-food interaction. *interactions* 27, 5 (2020), 34–39.
- [41] Markéta Dolejšová, Rohit Ashok Khot, Hilary Davis, Hasan Shahid Ferdous, and Andrew Quitmeyer. 2018. Designing recipes for digital food futures. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–8.
- [42] Allison Druin, Ben Bederson, Angela Boltman, Adrian Miura, Debby Knotts-Callahan, and Mark Platt. 1999. Children as our technology design partners. *The design of children's technology* 1 (1999), 51–72.
- [43] Anthony Duffy, Sarah E Bennett, Lucy Yardley, and Sylvain Moreno. 2024. The Virtual Co-design of Sleep Solved—A Case Study of an Educational Sleep App Designed with Teens. In *International Conference on Pervasive Computing Technologies for Healthcare*. Springer, 3–27.
- [44] Anthony Dunne and Fiona Raby. 2013. *Speculative Everything: Design, Fiction, and Social Dreaming*. The MIT Press.
- [45] Hamid Ekbia and Bonnie Nardi. 2016. Social inequality and HCI: The view from political economy. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. 4997–5002.
- [46] Charlene Elliott, Emily Truman, and Jason Edward Black. 2023. Tracking teen food marketing: participatory research to examine persuasive power and platforms of exposure. *Appetite* 186 (2023), 106550.
- [47] Chris Elsdén, David Chatting, Abigail C. Durrant, Andrew Garbett, Bettina Nissen, John Vines, and David S. Kirk. 2017. On Speculative Enactments. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (Denver, Colorado, USA) (CHI '17)*. Association for Computing Machinery, New York, NY, USA, 5386–5399. doi:10.1145/3025453.3025503
- [48] Daniel A Epstein, Monica Caraway, Chuck Johnston, An Ping, James Fogarty, and Sean A Munson. 2016. Beyond abandonment to next steps: understanding and designing for life after personal informatics tool use. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 1109–1113.
- [49] John Ferrara. 2012. *Playful design: Creating game experiences in everyday interfaces*. Rosenfeld Media.
- [50] Barbara H Fiese, Kimberly P Foley, and Mary Spagnola. 2006. Routine and ritual elements in family mealtimes: Contexts for child well-being and family identity. *New directions for child and adolescent development* 2006, 111 (2006), 67–89.
- [51] Barbara H Fiese and Marlene Schwartz. 2008. Reclaiming the Family Table: Mealtimes and Child Health and Wellbeing. Social Policy Report. Volume 22, Number 4. *Society for Research in Child Development* (2008).
- [52] Daniel Bowen Fitton, Janet C Read, and Sherel Thompson. 2022. Understanding Instagram's Deep Dive into Teen Mental Health. In *Electronic Workshops in Computing*. British Computer Society (BCS).
- [53] Anne C Fletcher and Bethany L Blair. 2014. Maternal authority regarding early adolescents' social technology use. *Journal of Family Issues* 35, 1 (2014), 54–74.
- [54] Hunter Fong, Selim Soufargi, Maurizio Mancini, and Radoslaw Niewiadomski. 2025. *Designing Interactions for Artificial Commensal Companions*. Association for Computing Machinery, New York, NY, USA, 306–311. <https://doi.org/10.1145/3715668.3736351>
- [55] Adrienne Frech. 2012. Healthy behavior trajectories between adolescence and young adulthood. *Advances in life course research* 17, 2 (2012), 59–68.
- [56] Jaimie Lee Freeman and Gina Neff. 2023. The challenge of repurposed technologies for youth: Understanding the unique affordances of digital self-tracking for adolescents. *new media & society* 25, 11 (2023), 3047–3064.
- [57] Liza Gak, Isabel Li, Daniela Rosner, and Niloufar Salehi. 2025. 'The world has changed...' — Unlocking Teen Perspectives on Technological Futures through Design Fiction Workshops. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–9. doi:10.1145/3706599.3719952
- [58] William Gaver. 2011. Making spaces: how design workbooks work. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Vancouver, BC, Canada) (CHI '11)*. Association for Computing Machinery, New York, NY, USA, 1551–1560. doi:10.1145/1978942.1979169
- [59] Tom Gayler, Corina Sas, and Vaiva Kalnikaitė. 2022. Exploring the design space for human-food-technology interaction: An approach from the lens of eating experiences. *ACM Transactions on Computer-Human Interaction* 29, 2 (2022), 1–52.
- [60] Julie Katherine Gibson-Graham. 1997. The end of capitalism (as we knew it): A feminist critique of political economy. *Capital & Class* 21, 2 (1997), 186–188.
- [61] Victoria A Goodyear, Charlotte Kerner, and Mikael Quennerstedt. 2019. Young people's uses of wearable healthy lifestyle technologies; surveillance, self-surveillance and resistance. *Sport, education and society* 24, 3 (2019), 212–225.
- [62] Mark D Griffiths. 2015. Problematic technology use during adolescence: why don't teenagers seek treatment? *Education and Health* 33, 1 (2015), 6–9.
- [63] Andrea Grimes and Richard Harper. 2008. Celebratory technology: new directions for food research in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Florence, Italy) (CHI '08)*. Association for Computing Machinery, New York, NY, USA, 467–476. doi:10.1145/1357054.1357130
- [64] Shad Gross, Jeffrey Bardzell, Shaowen Bardzell, and Michael Stallings. 2017. Persuasive anxiety: designing and deploying material and formal explorations of personal tracking devices. *Human-Computer Interaction* 32, 5–6 (2017), 297–334.
- [65] Ellie Harmon and Melissa Mazmanian. 2013. Stories of the Smartphone in everyday discourse: conflict, tension & instability. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Paris, France) (CHI '13)*. Association for Computing Machinery, New York, NY, USA, 1051–1060. doi:10.1145/2470654.2466134
- [66] Christina Harrington and Tawanna R Dillahunt. 2021. Eliciting Tech Futures Among Black Young Adults: A Case Study of Remote Speculative Co-Design. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (Yokohama, Japan) (CHI '21)*. Association for Computing Machinery, New York, NY, USA, Article 397, 15 pages. doi:10.1145/3411764.3445723

- [67] Marie Hebrok and Henry Mainsah. 2022. Skinny as a bird: design fiction as a vehicle for reflecting on food futures. *Futures* 141 (2022), 102983.
- [68] Karen Holtzblatt, Jessamyn Burns Wendell, and Shelley Wood. 2004. *Rapid contextual design: a how-to guide to key techniques for user-centered design*. Elsevier.
- [69] Matthew K Hong, Udaya Lakshmi, Thomas A Olson, and Lauren Wilcox. 2018. Visual ODLs: Co-designing patient-generated observations of daily living to support data-driven conversations in pediatric care. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–13.
- [70] Stephanie Houde and Charles Hill. 1997. What do prototypes prototype? In *Handbook of human-computer interaction*. Elsevier, 367–381.
- [71] Giulio Iacucci, Kari Kuutti, and Mervi Ranta. 2000. On the move with a magic thing: role playing in concept design of mobile services and devices. In *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques*. 193–202.
- [72] Netta Iivari and Marianne Kinnula. 2018. Empowering children through design and making: towards protagonist role adoption. In *Proceedings of the 15th Participatory Design Conference: Full Papers-Volume 1*. 1–12.
- [73] Ole Sejer Iversen, Rachel Charlotte Smith, and Christian Dindler. 2017. Child as protagonist: Expanding the role of children in participatory design. In *Proceedings of the 2017 conference on interaction design and children*. 27–37.
- [74] Eunkyung Jo, Hyeonseok Bang, Myeonghan Ryu, Eun Jee Sung, Sungmook Leem, and Hwajung Hong. 2020. MAMAS: supporting parent–child mealtime interactions using automated tracking and speech recognition. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW1 (2020), 1–32.
- [75] Yasmin B Kafai, Deborah A Fields, and MS Cook. 2010. Your second selves: Avatar designs and identity play. *Games and Culture* 1, 5 (2010), 23.
- [76] Elvin Karana, Elisa Giaccardi, Niels Stamhuis, and Jasper Goossensen. 2016. The tuning of materials: a designer's journey. In *Proceedings of the 2016 ACM conference on designing interactive systems*. 619–631.
- [77] Saskia M. Kelders, Robin N. Kok, and Julia E. W. C. Van Gemert-Pijnen. 2011. Technology and adherence in web-based interventions for weight control: a systematic review. In *Proceedings of the 6th International Conference on Persuasive Technology: Persuasive Technology and Design: Enhancing Sustainability and Health* (Columbus, Ohio, USA) (PERSUASIVE '11). Association for Computing Machinery, New York, NY, USA, Article 3, 8 pages. doi:10.1145/2467803.2467806
- [78] Ursula Kenny, Mary-Pat O'Malley-Keighran, Michal Molcho, and Colette Kelly. 2017. Peer influences on adolescent body image: friends or foes? *Journal of Adolescent Research* 32, 6 (2017), 768–799.
- [79] Charlotte Kerner and Victoria A Goodyear. 2017. The motivational impact of wearable healthy lifestyle technologies: a self-determination perspective on Fitbits with adolescents. *American journal of health education* 48, 5 (2017), 287–297.
- [80] Rohit Ashok Khot, Deepti Aggarwal, Jung-Ying Yi, and Daniel Prohasky. 2021. Guardian of the Snacks: Toward designing a companion for mindful snacking. *Multimodality & Society* 1, 2 (2021), 153–173.
- [81] Rohit Ashok Khot, Florian Mueller, et al. 2019. Human-food interaction. *Foundations and Trends® in Human-Computer Interaction* 12, 4 (2019), 238–415.
- [82] Rohit Ashok Khot, Jung-Ying (Lois) Yi, and Deepti Aggarwal. 2020. SWAN: Designing a Companion Spoon for Mindful Eating. In *Proceedings of the Fourteenth International Conference on Tangible, Embedded, and Embodied Interaction* (Sydney NSW, Australia) (TEI '20). Association for Computing Machinery, New York, NY, USA, 743–756. doi:10.1145/3374920.3375009
- [83] Rohit Ashok Khot, Jung-Ying (Lois) Yi, and Deepti Aggarwal. 2020. SWAN: Designing a Companion Spoon for Mindful Eating. In *Proceedings of the Fourteenth International Conference on Tangible, Embedded, and Embodied Interaction* (Sydney NSW, Australia) (TEI '20). Association for Computing Machinery, New York, NY, USA, 743–756. doi:10.1145/3374920.3375009
- [84] Victoria C Krings, Kristof Dhont, and Gordon Hodson. 2022. Food technology neophobia as a psychological barrier to clean meat acceptance. *Food Quality and Preference* 96 (2022), 104409.
- [85] Rotem Landesman, Jina Yoon, Jaewon Kim, Daniela E Munoz Lopez, Lucia Magis-Weinberg, Alexis Hiniker, and Katie Davis. 2024. "I Just Don't Care Enough To Be Interested": Teens' Moment-By-Moment Experiences on Instagram. In *Proceedings of the 23rd Annual ACM Interaction Design and Children Conference* (Delft, Netherlands) (IDC '24). Association for Computing Machinery, New York, NY, USA, 14–29. doi:10.1145/3628516.3655812
- [86] Mailin Lemke and Hendrik NJ Schifferstein. 2021. The use of ICT devices as part of the solo eating experience. *Appetite* 165 (2021), 105297.
- [87] Paul M Leonardi. 2011. When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS quarterly* (2011), 147–167.
- [88] Ian Li, Jodi Forlizzi, and Anind Dey. 2010. Know thyself: monitoring and reflecting on facets of one's life. In *CHI'10 Extended Abstracts on Human Factors in Computing Systems*. 4489–4492.
- [89] Li Li. 2023. Diegetic Prototypes in the Design Fiction Film Her: A Posthumanist Interpretation. *Journal of Futures Studies* 27, 3 (2023).
- [90] Joseph Lindley and Paul Coulton. 2015. Back to the future: 10 years of design fiction. In *Proceedings of the 2015 British HCI Conference* (Lincoln, Lincolnshire, United Kingdom) (British HCI '15). Association for Computing Machinery, New York, NY, USA, 210–211. doi:10.1145/2783446.2783592
- [91] Joseph Lindley and Paul Coulton. 2016. Pushing the Limits of Design Fiction: The Case For Fictional Research Papers. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16). ACM, New York, NY, USA, 4032–4043. doi:10.1145/2858036.2858446
- [92] Alexandra R Lonergan, Kay Bussey, Jasmine Fardouly, Scott Griffiths, Stuart B Murray, Phillipa Hay, Jonathan Mond, Nora Trompetter, and Deborah Mitchison. 2020. Protect me from my selfie: Examining the association between photo-based social media behaviors and self-reported eating disorders in adolescence. *International Journal of Eating Disorders* 53, 5 (2020), 755–766.
- [93] Sonia Massari (Ed.). 2025. *Food Design for the Real World: Design by and for food, place-based innovation and transformative design*. FrancoAngeli, Milano, Italy. https://www.researchgate.net/publication/393218366_Food_Design_for_the_Real_World_Design_by_and_for_food_place-based_innovation_and_transformative_design
- [94] Suzanne E Mazzeo, Madison Weinstock, Taylor Nadine Vashro, Taryn Henning, and Karly Derrigo. 2024. Mitigating harms of social media for adolescent body image and eating disorders: a review. *Psychology research and behavior management* (2024), 2587–2601.
- [95] Dianne Neumark-Sztainer, Melanie Wall, Nicole I Larson, Marla E Eisenberg, and Katie Loh. 2011. Dieting and disordered eating behaviors from adolescence to young adulthood: findings from a 10-year longitudinal study. *Journal of the American Dietetic Association* 111, 7 (2011), 1004–1011.
- [96] Elinor Ochs and Merav Shohet. 2006. The cultural structuring of mealtime socialization. *New directions for child and adolescent development* 2006, 111 (2006), 35–49.
- [97] Kyrill Potapov and Paul Marshall. 2020. LifeMosaic: co-design of a personal informatics tool for youth. In *Proceedings of the Interaction Design and Children Conference* (London, United Kingdom) (IDC '20). Association for Computing Machinery, New York, NY, USA, 519–531. doi:10.1145/3392063.3394429
- [98] Marc Prensky. 2001. Digital Natives, Digital Immigrants Part 1. *On the Horizon* 9, 5 (2001), 1–6. <https://www.emerald.com/insight/content/doi/10.1108/10748120110424816/full/html>
- [99] Yara Qutteina, Charlotte De Backer, and Tim Smits. 2019. Media food marketing and eating outcomes among pre-adolescents and adolescents: A systematic review and meta-analysis. *Obesity Reviews* 20, 12 (2019), 1708–1719.
- [100] Elise L Rice and William MP Klein. 2019. Interactions among perceived norms and attitudes about health-related behaviors in US adolescents. *Health Psychology* 38, 3 (2019), 268.
- [101] K Andrew R Richards and Michael A Hemphill. 2018. A practical guide to collaborative qualitative data analysis. *Journal of Teaching in Physical education* 37, 2 (2018), 225–231.
- [102] John Rooksby, Mattias Rost, Alistair Morrison, and Matthew Chalmers. 2014. Personal tracking as lived informatics. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 1163–1172.
- [103] Christine Satchell and Paul Dourish. 2009. Beyond the user: use and non-use in HCI. In *Proceedings of the 21st annual conference of the Australian computer-human interaction special interest group: Design: Open 24/7*. 9–16.
- [104] Benjamin Saunders, Julius Sim, Tom Kingstone, Shula Baker, Jackie Waterfield, Bernadette Bartlam, Heather Burroughs, and Clare Jinks. 2018. Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality & quantity* 52, 4 (2018), 1893–1907.
- [105] Dennis Schleicher, Peter Jones, and Oksana Kachur. 2010. Bodystorming as embodied designing. *interactions* 17, 6 (2010), 47–51.
- [106] Yilin Shao, Boyu Feng, Yingpin Chen, Yue Yang, Weijun Li, Yifan Yan, Yanan Wang, Ye Tao, Lingyun Sun, and Guanyun Wang. 2023. Edibletoy: Empowering children to create their own meals with a diy wafer paper kit. In *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*. 619–623.
- [107] Avneet Sing. [n.d.]. Generative AI 'Food Coach' that pairs food with your mood. <https://developers.googleblog.com/en/generative-ai-food-coach-that-pairs-food-with-your-mood/>
- [108] Anna Smout, Dharshani Tharanga Chandrasekara, Ling Wu, Glenn Melvin, Joshua Paolo Seguin, Patrick Olivier, Mairead Claire Cardamone-Breen, Tom Bartindale, Roisin Mcnane, and Marie BH Yap. 2023. Enabling digital parenting interventions to promote empathic partnerships among parents, educators, and adolescents targeting school refusal. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–13.
- [109] Bonnie A Spear. 2002. Adolescent growth and development. *Journal of the Academy of Nutrition and Dietetics* (2002), S23.
- [110] Charles Spence and Carlos Velasco. 2025. *Digital dining: New innovations in food and technology*. Springer Nature.
- [111] Laurence Steinberg. 2005. Cognitive and affective development in adolescence. *Trends in cognitive sciences* 9, 2 (2005), 69–74.
- [112] Eric Stice. 2002. Risk and maintenance factors for eating pathology: a meta-analytic review. *Psychological bulletin* 128, 5 (2002), 825.

- [113] Mary Story, Dianne Neumark-Sztainer, and Simone French. 2002. Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic association* 102, 3 (2002), S40–S51.
- [114] Yi Ling Tai, Deepti Aggarwal, and Rohit Ashok Khot. 2020. Reconnecting with Food through Dining Play. In *Proceedings of the Annual Symposium on Computer-Human Interaction in Play*. 334–348.
- [115] Saki Toi. [n. d.]. A Japanese bakery is using AI to produce 'romance bread' targeted at love-averse youth. <https://www.yahoo.com/lifestyle/japanese-bakery-using-ai-produce-011710841.html>
- [116] Sherry Turkle. 2015. *Reclaiming conversation: The power of talk in a digital age*. Penguin.
- [117] Laura R Uhlmann, Caroline L Donovan, Melanie J Zimmer-Gembeck, Hayley S Bell, and Robin A Ramme. 2018. The fit beauty ideal: A healthy alternative to thinness or a wolf in sheep's clothing? *Body image* 25 (2018), 23–30.
- [118] Carlos Velasco, Felipe Reinoso Carvalho, Olivia Petit, and Anton Nijholt. 2016. A multisensory approach for the design of food and drink enhancing sonic systems. In *Proceedings of the 1st workshop on multi-sensorial approaches to human-food interaction*. 1–7.
- [119] Carlos Velasco and Marianna Obrist. 2021. Multisensory experiences: A primer. *Frontiers in Computer Science* 3 (2021), 614524.
- [120] Carlos Velasco, Qian Janice Wang, Marianna Obrist, and Anton Nijholt. 2021. A Reflection on the State of Multisensory Human–Food Interaction Research. *Frontiers in Computer Science* 3 (2021), 694691.
- [121] Tami M Videon and Carolyn K Manning. 2003. Influences on adolescent eating patterns: the importance of family meals. *Journal of adolescent health* 32, 5 (2003), 365–373.
- [122] Russell M Viner, Elizabeth M Ozer, Simon Denny, Michael Marmot, Michael Resnick, Adesegun Fatusi, and Candace Currie. 2012. Adolescence and the social determinants of health. *The lancet* 379, 9826 (2012), 1641–1652.
- [123] Chun-Han Wang, Stephen Tsung-Han Sher, Isabela Salman, Kelly Janek, and Chia-Fang Chung. 2022. "TikTok Made Me Do It": Teenagers' Perception and Use of Food Content on TikTok. In *Proceedings of the 21st Annual ACM Interaction Design and Children Conference (Braga, Portugal) (IDC '22)*. Association for Computing Machinery, New York, NY, USA, 458–463. doi:10.1145/3501712.3535290
- [124] Chun-Han Ariel Wang, Stephen Tsung-Han Sher, and Chia-Fang Chung. 2024. From Viral Content to Real-Life Cuisine and Beyond: Examining Teenagers' Interactions with TikTok Food Videos and the Influence on their Food Practices. *Proc. ACM Hum.-Comput. Interact.* 8, CSCW2, Article 389 (Nov. 2024), 30 pages. doi:10.1145/3686928
- [125] Yan Wang, Humphrey O Obie, Zhuoying Li, Flora D. Salim, John Grundy, and Florian 'Floyd' Mueller. 2024. GustosonicSense: Towards understanding the design of playful gustosonic eating experiences. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (Honolulu, HI, USA) (CHI '24)*. Association for Computing Machinery, New York, NY, USA, Article 361, 12 pages. doi:10.1145/3613904.3642182
- [126] Wikipedia. [n. d.]. ASMR. <https://en.wikipedia.org/wiki/ASMR>
- [127] Wikipedia contributors. 2025. Cloudy with a Chance of Meatballs (film). [https://en.wikipedia.org/wiki/Cloudy_with_a_Chance_of_Meatballs_\(film\)](https://en.wikipedia.org/wiki/Cloudy_with_a_Chance_of_Meatballs_(film)). [Online; accessed 4 December 2025].
- [128] Wikipedia contributors. 2025. Replicator (Star Trek). [https://en.wikipedia.org/wiki/Replicator_\(Star_Trek\)](https://en.wikipedia.org/wiki/Replicator_(Star_Trek)). [Online; accessed 4 December 2025].
- [129] Yuxing Wu, Andrew D. Miller, Chia-Fang Chung, and Elizabeth Kaziunas. 2024. "The struggle is a part of the experience": Engaging Discontents in the Design of Family Meal Technologies. *Proc. ACM Hum.-Comput. Interact.* 8, CSCW2, Article 477 (Nov. 2024), 33 pages. doi:10.1145/3687016
- [130] Yaman Yu, Tanusree Sharma, Melinda Hu, Justin Wang, and Yang Wang. 2025. Exploring parent-child perceptions on safety in generative AI: concerns, mitigation strategies, and design implications. In *2025 IEEE Symposium on Security and Privacy (SP)*. IEEE, 2735–2752.