BACKGROUND

- Participatory Design (PD) involves community members in the design of learning tools to design for, and by communities.\(^1\)
- However, design processes and outputs are influenced by researchers’ goals and pedagogical frameworks.\(^2\)
- Additionally, participants’ various roles in design shape project outputs.\(^3\)
- We describe a case study in a controlled design area: projects which created signs to promote learning in grocery spaces.
  - Ridge and colleagues (2015) installed signage in grocery stores and increased the number of conversations and interactions between caregivers and children in low-SES neighborhoods by 33%.\(^4\)
- We documented the design process and outputs of three projects—two prior replications of Ridge et al. (2015) and one ongoing PD project conducted by our research team.
- This study explores how different goals, pedagogical frameworks, and relationship configurations influence the design process and outputs of three PD projects.

RESEARCH QUESTIONS

1. How do learning theories and goals influence processes and outputs in participatory design?
2. How do relationship configurations between research teams and community members influence participatory design processes and outputs?

DATA SOURCES

- Transcribed interviews with 5 researchers from Projects 1 & 2 (61 pages)
- Transcriptions from Project 3’s co-design sessions with community members (56 pages)
- Fieldnotes/reflections from co-design sessions and subsequent signage development meetings for Project 3 (17 pages)

ANALYSIS

- To analyze our data, we developed a codebook based off the themes that emerged and wrote analytic memos to capture the learning theories, goals, and relationship configurations that surfaced across the three projects.\(^5\)
- Applying Drui’s (2002) Cooperative Inquiry Framework\(^6\), we conceptualized four roles community partners can take based on their participation in signage design processes:
  - User: Providing developers insight through user feedback
  - Informant: Being involved in the design process at multiple points
  - Design Partner: Being regarded as equal stakeholders throughout the whole design process
- Applying Dillavou’s (2002) Cooperative Inquiry Framework\(^7\), we conceptualized four roles community partners can take based on their participation in signage design processes:
  - Users & Logistic Informants
  - Users & Testers (Permissive Relationship)
  - Researchers
  - Community Informants

PROJECTS

Project 1: Pedagogical Frameworks:

- Cognitive and Social
  - Project 1 Learning Goal: Promote age-related math talk through directive language
  - Project 1 Pedagogical Frameworks:
    - Cognitive and Social
      - We decided to have one question that was low level targeted at the younger kids in our age range and then one that would be slightly more advanced that would require some arithmetic operation or more complex reasoning process to engage the slightly older kids.”
      - Project 1 researcher

Project 2: Pedagogical Frameworks:

- Cognitive and Social
  - Project 2 Learning Goal: Promote talk with more elaboration and conversational turns across a broad scope of topics related to school readiness
  - Project 2 Pedagogical Frameworks:
    - Cognitive and Social
      - “We went for sort of open-ended, what, why, the W questions… So it was very easy for the parents to elaborate on the guide. Play kind of questions (in the signage). So it was manipulating the kind of responses that people would give in try to get more conversations about naming colors, naming things that are rectangular, playing number games, that kind of stuff.”
      - Project 2 researcher

Project 3: Pedagogical Frameworks:

- Cognitive, Social, & Cultural
  - Project 3 Learning Goal: Promote STEM talk situated in local cultural interactions
  - Project 3 Pedagogical Frameworks:
    - Cognitive, Social, & Cultural
      - “This project looks for any underlying factors that affect the participants’ behaviors, which can exist within the family or in these participants’ communities. It is important for us to find these factors so that we can create posters relevant to this community’s needs.”
      - Project 3 researcher

Project 1 Community Roles:

- Users & Testers (Permissive Relationship)
  - Project 1 Community Roles:
    - Users & Testers (Permissive Relationship)
      - “The first grocery store we asked said they’d have to talk to corporate about placing signs and then I never heard anything. And then [the second store] said yes but if you’ve ever been inside [that store] their signs are all really specific. That caveat, was that they would have to create the signs, and kind of then found the whole point of the study. So we couldn’t do it with them because of that.”
      - Project 1 researcher

Project 2 Community Roles:

- Users & Logistic Informants
  - Project 2 Community Roles:
    - Users & Logistic Informants
      - “We [helped] to choose products that were kind of in stock or in demand throughout, just so that we know that it would be realistic. We talked with the people in charge to see what items they typically get, what sort of products always come in, no matter what… things like that.”
      - Project 2 researcher

Project 3 Community Role:

- Cultural Informants
  - Project 3 Community Role:
    - Cultural Informants
      - “It’s kind of a cultural thing, for those of us who are [Latino], well, […] our parents didn’t measure things, it was all by rough estimate. (If it doesn’t have salt, okay, add it until it gets salty enough).”
      - Community participant

RESULTS AND VIGNETTES

- In Project 1, researchers designed math talk signs for younger children in a grocery store setting. The signs were placed in the bread section of the store and targeted children aged 2-6. The goal was to encourage math talk among younger children, to support their learning in a grocery setting.

- In Project 2, researchers developed signs to promote learning in grocery spaces. These signs were designed to encourage conversations around STEM topics. The signs were placed in the bread section of the store and targeted children aged 5-8. The goal was to encourage math talk among older children, to support their learning in a grocery setting.

- In Project 3, researchers developed signs to promote learning in grocery spaces. These signs were designed to encourage conversations around STEM topics and were placed in the bread section of the store. The signs were targeted at all children, to support their learning in a grocery setting.

DISCUSSION

- Each team’s unique configuration of learning goals, pedagogical frameworks, and community roles led to different affordances and constraints in their designs.
- Project 1: Affordances: direct feedback loop from users/testers yield output usable in the space
  - Constraints: permission relationships/infomants can result in a lack of alignment with community values
- Project 2: Affordances: user/logistic informant feedback yielded signs with the distinct routines and logistics of the space in consideration
  - Constraints: lack of alignment with overall culture/goals of community partner
- Project 3: Affordances: informant feedback yielded signs grounded in community experiences/values
  - Constraints: lack of user feedback can result in signs with limited usability in the space

IMPLICATIONS & FUTURE WORK

- In future community-based PD, researchers should consider their goals, pedagogical frameworks, and the extent to which they involve community partners as highly influential factors to design.
- Though it is a challenge to traditional research, incorporating community members as design partners could help alleviate constraints surrounding aligning community-researcher values and usability.

REFERENCES