Robot Exteriors for Life Transitions

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Robot Exteriors for Life Transitions

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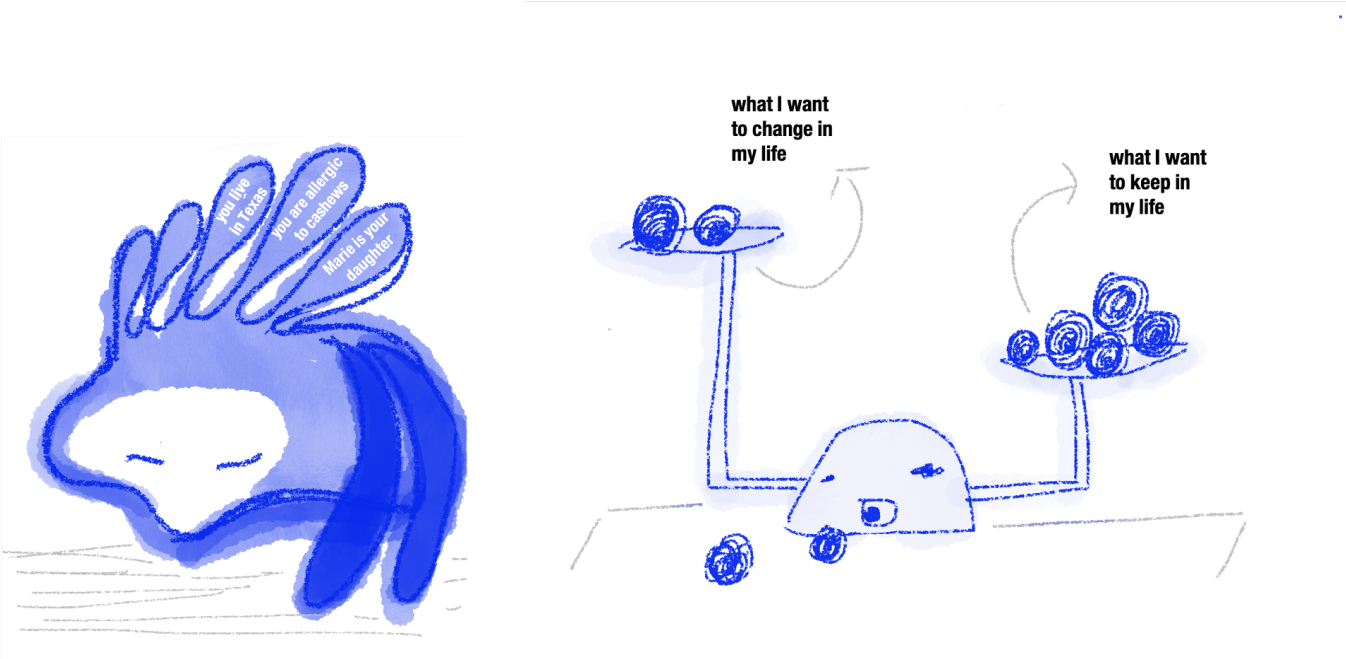

Figure 1: *Left:* Robot for Dementia — Robot made of silk fabric that is used in the home of an elderly person that shows signs of dementia. The silk fabric that covers the robot's body gently falls freely in the robot forming different layers. Each layer of the silk fabric has a note that reminds the elderly about their life. In the figure, there are three notes illustrated: *"You live in Texas"*, *"You are allergic to cashews"*, and *"Marie is your daughter"*. By petting the robot and uncovering the different layers of silk fabric, the elder is reminded of the important parts of their life. This robot is envisioned to be small with aprox 10 inches and can be placed on the top of a desk. *Right:* Robot for Unemployment — Robot holds two places, similarly to a lever, and each plate contains cotton spheres that represent what the person wants to keep in their life and what the person wants to change. An example of something to keep can be *"I want to continue living in my city"*, and something to change *"I want to change the line of work to something new"*. This robot is intended to motivate self-discovery and a sense of orientation upon a situation of unemployment. By promoting reflections the robot helps the user to conceal to the present moment and to look for new job opportunities according to new life goals.

ABSTRACT

Life transitions are a natural part of human life. Literature identified different types and patterns of life transitions (e.g., developmental and situational transitions), several properties of transition experiences (e.g., awareness and engagement on the transition), and different conditions of transition (factors that can facilitate or hinder transitions). In this work, I propose to use robots as objects that signal and support those that are under major life transitions. By making use of unconventional robot embodiments and materials, robots are used to convey alternative ways of interacting with humans, with the ultimate goal of facilitating life transitions. In this conceptual work, I elaborate on how robots can be used within four different life transitions: dementia, immigration, pregnancy, and unemployment.

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1 INTRODUCTION

Human life is full of transitions: we are born and die, we grow, get injured and cured, gain new friends and partners and lose them, become parents, change jobs, change homes. Transition means *change*. Everyone, at some point in their lives, experiences deep changes. Most of the time, changes have a positive impact on our lives. However, while some changes are desirable and normal, some are overwhelming and even traumatic. The determinant factor between a healthy and a traumatic life transition lives on the capacity of adaptation to change. If the change is too overwhelming for the individual it can lead to a crisis. If the individual developed the proper mechanisms of coping, the change can lead to growth [1–3]. Examples of major life changes are pregnancy, immigration, health changes (such as dementia), and unemployment.

In this work, I explored how social robots can be used as objects for a transition. By exploring their physical bodies and considering a variety of materials and non-conventional shapes, the robots presented in this paper are conceptual in their nature and show a future in which robots support and empower people in their major life transitions.

2 RELATED WORK ON TRANSITIONS

Transition is defined as an ongoing process that involves moving from one context to another as well as from one set of interpersonal relationships to another [4], resulting in the creation or renegotiation of relationships with others. Most people find life transitions fulfilling and can deal with them without major problems. However, some transitions can be difficult to deal with and have a deep effect on the individual's life and the people around them. Irrespective of the nature of transitions, professionals dealing with individuals that undergo major life transitions have an important role in support these changes [5]. In this work, I propose that robots can also serve as transition-supportive objects. I focused on two concepts from the Transition Theory: *types* and *properties* of transitions [6, 7]

There are four different types of transitions: developmental transitions, health and illness transitions, situational transitions, and organizational transitions. Developmental transitions are those due to developmental events including birth, adolescence, menopause, aging, and death. Health transitions relate to illness diagnosis or recovery processes [8]. Situational transitions include entering an educational program and immigrating from one country to another [9]. Organizational transitions are those related to changing environmental conditions that affect the lives of clients and workers [7]. In the context of this work, I explore how a robot can be used in the context of pregnancy (developmental transition), immigration (situational transition), unemployment (organizational transition), and dementia (health transition).

The properties of transition experiences include awareness, engagement, change and difference, time span, and critical points and events. In this work, I set to explore how a robot can be used as a transition object that promotes *awareness*, supporting the perception, knowledge, and recognition of the transition experience [6]. However, a person's awareness of change does not necessarily mean they have begun their transition [9]; the same way that a lack of awareness also does not always mean that the transition has not begun [6]. I also explored how a robot can promote *engagement* in the transition experience. The properties of transition also include *changes and differences* [6] and relate with changes in a person's identities, roles, relationships, abilities, and behaviors [7].

Another property of transitions is *time span* [6] as transitions can be characterized as flowing and moving over time [6]). Indeed, transition have an identifiable starting point to an eventual ending with a new beginning or period of stability. Related to this, transitions have *critical points* and events or markers such as birth, death, the cessation of menstruation, or the diagnosis of an illness [6]. In transitions theory, it was acknowledged that some transitions may not have specific marker events although most transitions have critical marker points and times.

3 ROBOTS AND LIFE TRANSITIONS

To explore how robots can be used as objects for transition, I used digital sketching and illustration to explore scenarios. It is well known that sketching is a fast-paced, low-risk, and economic method to explore alternative solutions [10]. I used the App called "Sketches" on an iPad to envision scenarios where robots can be used to support four different life transitions: pregnancy, unemployment, immigration, and dementia. My goal was to get inspiration from different materials and fabrics that I had in my home to envision several robot exteriors that relate to the transition process that the robot will support. I converged in four different robot exteriors, including a robot made of silk, a wood robot, a glass robot, and a robot composed of cotton spheres.

3.1 Robots for Dementia

The idea behind a robot for dementia is to use it as a piece of daily life that reminds the user of important notes. The robot's body is covered with layers of silk fabric, and each layer contains a note, reminder, or message of the person's life (see Figure 1). Silk was used in this scenario as it is a sophisticated material that provides a sense of dignity to someone that is undergoing a challenging transition of life as dementia is. By reminding the person about important aspects of their life, the robot is promoting awareness and engagement in the transition experience, which are important properties of such a stage [6].

3.2 Robots for Unemployment

Unemployment is a transition period that oftentimes promotes reflection and can lead to change or readjustments, but also ifs filled with emotions of fear, stress, and frustration. The design of this robot was inspired in a scale, where one side can be heavier than the other denoting more content in one side (see Figure 1). The user adds cotton spheres with a message written by them inside each sphere to one of the robot arms. One arm represents

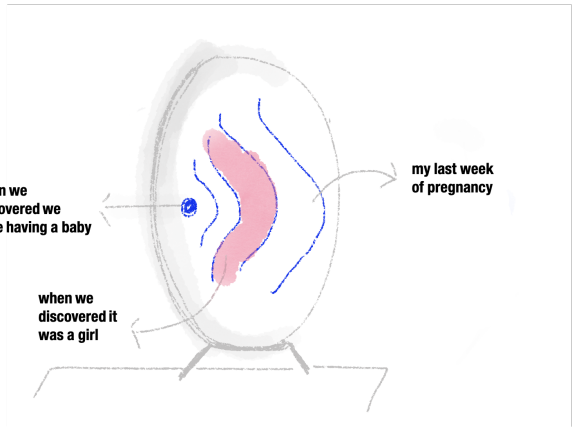

Figure 2: Robot for Pregnancy — Oval robot made of glass that contains in its interior a projection of the evolution of a pregnant belly. The robot signals the change in a woman's body and the memorable moments of pregnancy, such as a day the couple discovered they were going to be parents, the day they discovered the sex of the baby, and how the belly grew until the last week of pregnancy. This robot is envisioned to be small, measuring aprox 6x6 inches, and can sit on the top of a living room furniture. When the baby is born, this robot can be the a decoration piece in the baby's room.

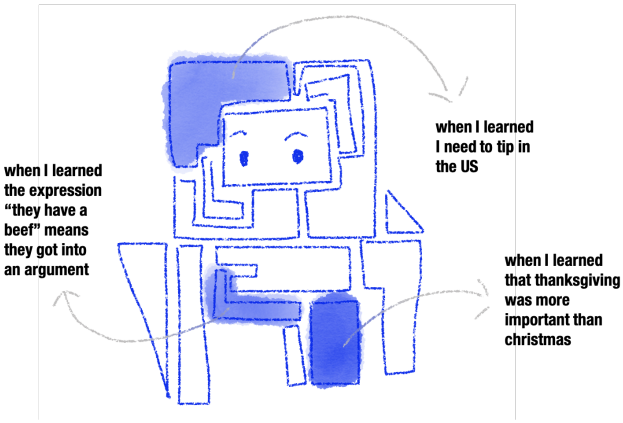

Figure 3: Robot for Immigration — Robot made of wood pieces. Each wood piece has a different form and size the robot is created by attaching different wood pieces. Each piece signals something new that an immigrant learned about the new country. The figure features three aspects of the American culture that immigrants can learn: *"when I learned I need to tip"*, *"when I learned the expression ´ they have a beef' means they got into an argument"*, and *"when I learned that Thanksgiving is a more important celebration than Christmas"*. The immigrant person slowly builds their robot, piece by piece, signaling the slow and sweet process of acculturation.

something that the user wants to keep in their life. For example, if the user decides to keep: *"I want to continue living in my city"*, then this will narrow the new job search to this area. The other arm represents something the user wants to change in their life. For example, if the user decides that *"I want to change the line of work to something new"*, this means the user is willing to learn a new skill and likely will engage in an educational program. By seeing the different cotton spheres in each robot arm, the user has a visual and physical representation for this transition stage, which could decrease internal uncertainty and promote healthy feelings and value-driven actions. The spheres are made of cotton to promote warmth and comfort in a period of life that can be baffling.

3.3 Robots for Pregnancy

This robot is inspired by the different changes in the body of a woman that discovers she is pregnant. The robot is oval-shaped and made of glass signifying fragility, beauty, and the transparency of a pregnant body. Inside the glass, there is a projection of the evolution of the pregnancy and its most important moments, e.g., when the couple discovered the gender of the baby. Pregnancy is a transition stage that despite being the most evidence in the body, also impels changing roles from women to mother, from male to father. This robot was designed to be the physical representation of a pregnancy for a couple, promoting conversations, reflections, and dialogue when they look at the robot that contains the history of their pregnancy.

3.4 Robots for Immigration

This robot is made of pieces of wood, each representing an acculturation data point (see Figure 3). Acculturation can be defined as the process of change as the result of the interaction between two or more cultures [11]. Given that acculturation is a process, usually a slow one, the robot will acquire its body shape given the wooden pieces that are added to its body. The user can only add a wooden piece if they have learned a new cultural norm of the new country they live in. For example, when the user learned that *"I need to tip in the US when I get a coffee"*, the user can write this norm in the wood and add it to the robot. Wood was chosen as it is related to trees and nature being a warm material that different cultures use in furniture and decoration. The shape of this robot can be of any form depending on the user's preferences. Additionally, there is no way to know if the robot's body is complete since immigration and acculturation is a never-ending process. This robot is a representation of change, learning, and open-mindedness.

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