

Bota: Facilitating a psychodiverse flight

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Bota is a personal water container for commercial air travel, which passengers can use and refill themselves at on-board water points. Passengers receive the empty container before take-off and can fill it at any point in mid-flight. When filled, the flexible water pouch needs to be held with two hands and squeezed to drink from it (Figure 1). The product has a positive effect on passenger's hydration, which is important for their health and well being. In addition to physical goals, the product also triggers various reversals and state changes during its usage scenario, which are intended to break the monotony of the flight experience and increase psychodiversity.

Figure 2 visualizes the usage scenario of the concept. Flight attendants distribute the empty water container after take-off. They are handed out empty for logistical purposes, but also to emphasize that they are to be filled by the passenger, and reusable. Furthermore, being handed a packaged product, rather than a bottle of water, makes passengers feel they are receiving a nice gift, triggering self-sympathy (Figure 2A). Passengers who are not in an aisle seat often feel some reluctance in asking their neighbour(s) to get up for them. When a passenger wants to get up, holding the bottle can work as a kind of "pass" to show fellow passengers their intention. Instead of having to wait for in-flight service, passengers can take matters into their own hands, triggering the rebellious and mastery states (Figure 2B). When several people use the centrally located water point simultaneously, it can serve as a place for social interaction. Passengers at the water point can meet others face to face, which rarely occurs during a flight. The water point can trigger the other-sympathy state (Figure 2C). Back at their seat, passengers can hang their bottle at their tray table and drink when they like. (Figure 2D) If the water container has not been drunk from in a while, a message slowly appears on it that nudges the user to drink from it again, or to refill it if it is empty. This is meant to induce the conforming-telic state (Figure 2E). Passengers are encouraged to keep the bottle after their



Figure 1. The Bota bottle concept.

flight to use at their destination and at their next flight (Figure 2F).

Design challenge

This project was part of the author's Master's thesis in Industrial Design Engineering at Delft University (Scarpellini, 2014). It was developed for the In-flight services department of KLM Royal Dutch Airlines, and it addressed passengers on long-haul flights in economy class. The project's main focus was to find a way to make such flights less mentally and physically draining. Being in an airplane for more than eight hours is physically draining because the air quality is poor (the same air is constantly recycled), people cannot always eat and drink when they wish, and physical movement is severely constrained. The airplane environment is also mentally draining because of the constant noise, the constrained space, and the inability to switch between activities. On the other hand, because passengers have a lot of time on their hands, there is much opportunity to introduce something novel that passengers can engage with.

Project approach

The project followed an explorative design process, with several qualitative research parts and design steps. The research parts comprised an explorative questionnaire and a role-playing session with participants experienced with intercontinental flying. The explorative questionnaire was dis-

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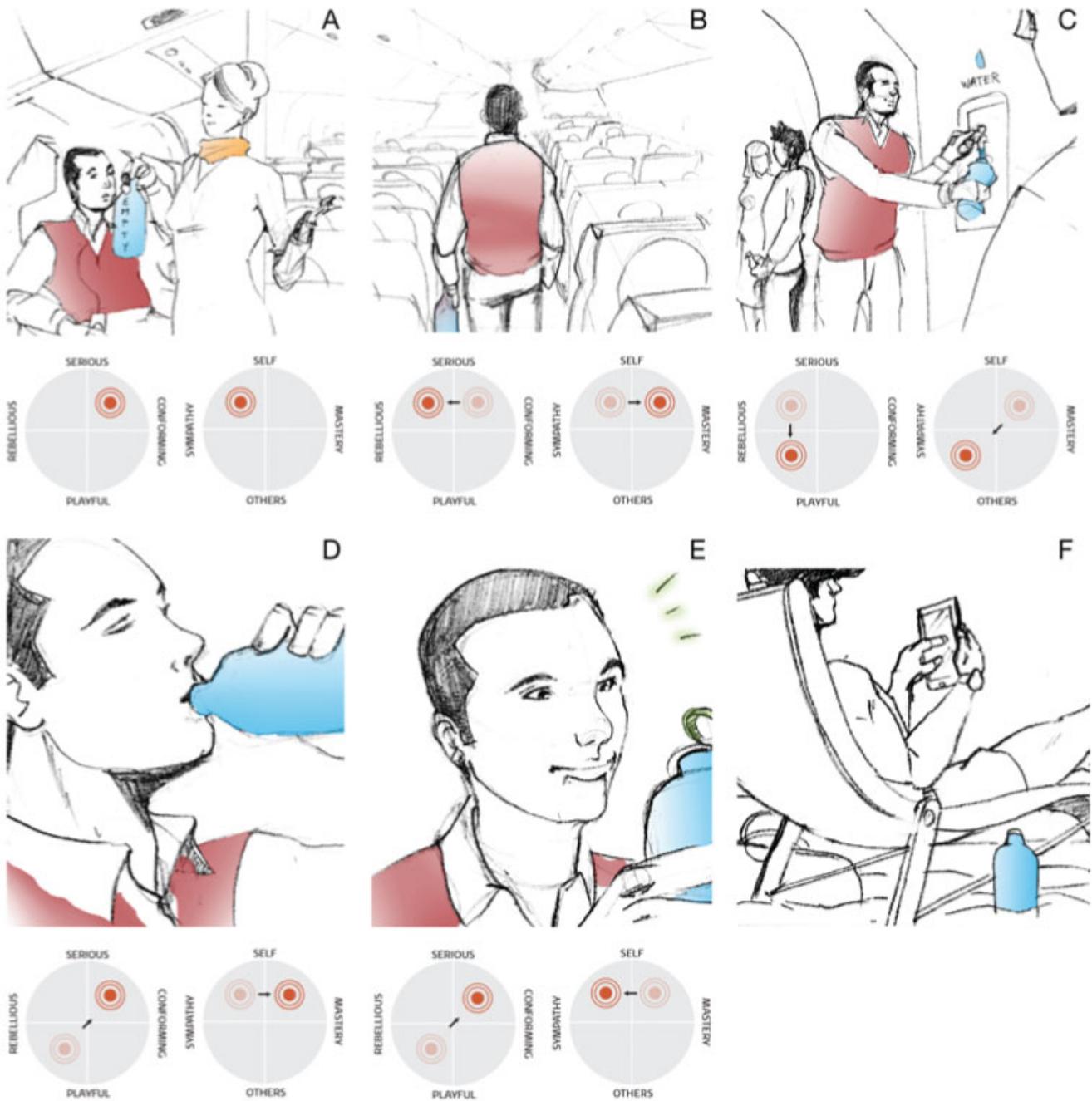


Figure 2. Usage scenario with intended state changes.

tributed on an intercontinental flight (20 distributed; 12 returned with questions answered; 7 with all questions answered). It asked them to evaluate different situations in the plane, asked questions to determine the participant’s state dominance, and probed on the emotions that participants experienced in different parts of the flight. The self-reported emotion measurement was based on the sixteen emotions highlighted by reversal theory (Apter, 2007), of which a short

description and illustrated facial expressions were provided. The role-playing session further explored the different situations that arise in long-distance air travel, and the motivations and emotions that are evoked by them. The participants went through several scenarios, and reflected on how they felt and how they would react in such a situation. The carousel of feelings tool was used to structure the analysis (see Van Midwoud et al., this issue). Together with the moderator, the

participants drew up a list of findings and possible solutions to problems on-board.

The research resulted in six potential directions for the design phase, which produced seven different product concepts. Out of these concepts, the Bota concept was chosen as the most relevant, effective, and feasible. After several iterative design steps, a final test was done on an intercontinental flight with prototypes of the water container to test its effectiveness (N=90).

Insights and design implications

The explorative questionnaire found that the main problem of the experience of long-haul flights is a lack of variation (psychodiversity). Although every passenger is able to engage in enjoyable activities, such as reading, watching a movie, or playing a game, after a certain amount of time none of these activities seem appealing anymore. The research found that this is because people get stuck in one or a few motivational states, and are not able to reverse. Mainly, people get stuck in the paratelic state. Moreover, the lack of meaningful stimuli keeps the arousal low, so passengers get bored after a while. Furthermore, because there are few tangible goals or expectations it is also difficult for passengers to reverse to the telic state. Secondly, being restricted by several safety-rules, and being in a small space with a lot of people, causes most people to stay in the conforming state. Passengers can only experience the rebellious state in a negative way, for instance through outbursts of anger about the situation or the service. Lastly, passengers are mostly doing activities with or for themselves, and do not have much eye contact with others because of the seating arrangement, which keeps them in the self-state.

The concept of psychodiversity (Apter, 2007) suggests that it is important for people's well-being to regularly switch between all motivational states. The current research suggested that psychodiversity is equally important for mental energy on-board. The design phase took this idea as a starting point to create a product that gives people the opportunity to reverse through several motivational states while using it (see Figure 2).

The final test revealed that 9 out of 90 participants (10%) used the Bota prototype to get water at the water point several times. This may not seem high, but it is significant, considering that it is a novel product, and many people are not even aware that airplanes have a self-service water point. The after-flight interviews with these participants revealed that they highly appreciated that they regained some control

over their flying experience by getting a drink whenever they wanted. This seemed to induce both the self-mastery state (self-reliance) and the telic state (briefly having a specific goal). Another striking finding was that several passengers went to refill their bottle together, as well as passengers refilling other people's bottles. This shows the potential of the product to induce the other state and decrease transactional outcome by showing kindness. In a short questionnaire after the test, 8 out of the 9 participants (88%) stated that they intended to keep the water container after the flight for at least a month.

Discussion

In this project, reversal theory formed a framework through which the research could be framed and the intended effect of the product (usage) could be determined. Psychodiversity proved to be a central concept in both stages. Using reversal theory to analyze and improve the in-flight experience was challenging in some aspects, and easy in others. It was challenging because the possibilities for change were very limited, for reasons of safety and finance, both of which are central in the airline business. At the same time, it was relatively easy to analyze and improve the in-flight experience because it is so homogeneous and predictable. This made it more likely that it was possible to find a single solution that would suit many different passengers.

During the research phase, it proved challenging to ask people directly about their motivational state, without first explaining them the basics of reversal theory. As a solution, they instead indicated which emotion they experienced, from which their motivational state was implied.

Although reversal theory was useful during the conceptual design of the product experience, when it came to the embodiment design – the design of the shape, materials and precise functions of the product – the theory offered fewer clues. This might be an interesting new field to explore.

References

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