Project 2: Start Simple with MyPlate App Prototyping

IE 4880: Group #3

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INTRODUCTION

According to the United States Department of Health and Human Services, 2015, leading a sedentary lifestyle and having poor nutritional habits poses significant challenges, present and future, to public health systems and to the economy. About half of all American adults have one or more preventable chronic diseases, many of which are related to poor quality eating patterns and physical inactivity. These chronic ailments include cardiovascular disease, high blood pressure, type 2 diabetes, some cancers, and poor bone health, among others. More than two-thirds of adults and nearly one-third of children and youth in America are overweight or obese. These high rates of obesity and chronic disease have persisted for more than two decades (HHS, 2015).

In response to this troubling trend, the U.S. Department of Agriculture (USDA) introduced the "Start Simple with MyPlate" campaign. A part of this campaign includes an app of the same name ("USDA", 2019). The goal of the app is to educate Americans about simple, easy choices they can make every day to be healthier and to enable them to make these choices incrementally over time. In this way, the choices become habits, and the habits subsequently become a lifestyle.

In Phase I of this project, a hierarchical task analysis (HTA) was conducted on each of eight tasks associated with using the MyPlate app: initializing the app, setting goals, editing goals, completing/checking off goals, browsing badges, learning more about the MyPlate initiative, managing notifications, and navigating the support center. A heuristic evaluation (HE) was also completed for each of said tasks, using Nielsen's 10 Usability Heuristics for User Interface Design (Nielsen, 1993). The following section of this report, *Modified User Interfaces,* identifies the specific updates to be made to the MyPlate app, as determined by the HTA and HE mentioned above. Most of these modifications have to do with aesthetics and navigation, but there are several updates that relate to how information is presented or what users are allowed to do with the app, as will be described in more detail in the upcoming section.

The section afterward, *Hypotheses on User Impact*, presents hypotheses that explain why the modifications to the MyPlate app will fix the problems identified in the HTA and HE. The goal of this phase was to implement changes that address the issues discovered in Phase I in a prototype that will be used in Phase III of this project, which will investigate the user experience with the modified and current interfaces through interviews to determine if the implemented improvements completed in this phase improve the app.

MODIFIED USER INTERFACES

For each of the eight tasks generated in the previous phase of the project, a specific improvement was implemented targeting an issue identified in the heuristic evaluation. The app was recreated in Axure to create a prototype of the current app's interface. These improvements were then implemented in a copy of this prototype, also in Axure, to create a modified user interface prototype. Both the current interfaces and the modified interfaces were generated in Axure to provide consistent experiences for users in the next phase of the project so that the improvements of the modified interface can be evaluated properly, as using the actual app interface would bias the user due to the full implementation and aesthetics employed in the actual versions that are not necessary for a prototype. In terms of general trends in improvements, the app needed to have consistent placement of a back button. There were times where once a user got to a given page, it was not intuitive how to go back one page without being forced to go to the Home Screen and having to navigate to the same place again. Therefore, a back arrow was placed in the upper left corner of each page in the application so that users could easily navigate, better meeting the Heuristic #5 of helping users recover from errors. Overall, each of the tasks also had issues with the third heuristic, user control and freedom, as there were often either limited options or the user would not have the capacity to navigate easily to the pages needed to complete a given task as the pages with related information were not linked as the user would intuitively assume.

For the first task, initializing the app, the back button was the most needed improvement. This task scored poorly on user control and freedom, Heuristic #3, as there was no back button present. On the initial tutorial screens, there is a "Next" button in addition to the option of swiping. For those users who were not able to swipe or were not aware that swiping was an option, a back button was placed in the upper left-hand corner (Figure 1, Appendix). Additionally, if a user clicked through the tutorial to the app to the "Let's Get Started" page and needed to go back and re-read, the user could not do so without uninstalling the app and reinstalling to trigger the popup. Therefore, a back button was placed under the "Thanks! I'm Ready!" option to allow more user control and freedom in this task (Figure 2, Appendix).

For the second task, setting goals, when using the provided "Pick for Me" option, which randomly selects one goal per group for the user to complete, the user is unable to decide the number of goals to be selected in each group. This means the user lacks control and freedom, which is the third heuristic under the heuristic evaluation guidelines. Therefore, in the modified interface, users will have the option after clicking "Pick for Me" to choose the number of goals they would like set by the app in a difficulty pop-up. The user is asked to select whether they want easy, medium, or hard goals to achieve, with "Easy" representing 1 goal chosen in each food group, "Medium" representing 2 goals per food group, and "Hard" representing 3 goals per food group (Figure 3, Appendix). After selecting this difficulty, the "Pick for Me" option functions similarly to how it does in the original interface, where the selected number of goals is randomly chosen in each food group.

For the third task, editing goals, there were two heuristic improvements that needed to be addressed: user control and freedom (Heuristic #3) and flexibility and efficiency of use (Heuristic #8). For user control and freedom, the application currently has a cap on the number of goals a user can set in a day. In the improved interface, this cap is removed to allow users to determine how many goals they would like to set; the maximum goals chosen pop-up was removed as a result of this removed cap for goal

setting (Figure 4, Appendix). For flexibility and efficiency of use, the issue was with the edit button being easily accessible and visible. The button was too small and hard to find to initiate the editing process. Therefore, the edit button was changed into a button with a solid background such that the text does not blend in with the textured background in the original version of the app, thus increasing the contrast of the button.

For the fourth task, completing and checking off goals, the issue was with user control (Heuristic #3) and with recognition rather than recall (Heuristic #7). The goals are separated according to their food group category, which is convenient for goal setting but makes it frustrating as a user to check off completed goals, or to see what goals were assigned for that day. Therefore, in the modified interface, a concise list of all goals will be provided. A "Today's Goals" button replaced the "Pick for Me" button once goals have been selected. Once the user selects "Today's Goals", a list of all goals can be found with the ability for users to check each goal off, and the associated food tip still linked beside each goal (Figure 5, Appendix). The food category is listed at the beginning of the goal; for example, a goal could be "Fruit: Eat one piece of fruit today", such that the user is aware of what category the goal belongs to. Furthermore, the food group category name has a font color that matches the color assigned to it throughout the MyPlate, such that fruit is red, vegetables are green, dairy is blue, purple is protein, and orange is grains, to further emphasize which goals belong to which categories to help with keeping the intention of having goals separated by category, but having them in one concise list for user convenience.

For the fifth task, browsing badges, there were not any noticeable heuristic issues. The only noticeable issue was that there was a section location for "Challenge" badges, however, this part of the app was left unimplemented. Therefore, in the modified user interface, some example challenge badges were added so that the full functionality of the app was available for users (Figure 6, Appendix).

For the sixth task, "Learn More About...", the main issue came when navigating to this page from a tip provided next to goals. In the current interface, when looking at a goal set for the day, an icon appears to the right labeled "Tip", which triggers a pop-up with some ideas on how a user can achieve the set goal. There is an option on this "Tip" page that allows the user to "Learn more at MyPlate 101", which navigates the user to learn more about the given food group. However, using the back button on this "About" page takes the user to the "MyPlate101" home page, and not back to the goal tip page like the user intuitively would assume. Therefore, the "About" page for the given food group will become a popup on the page, where users will click an "X" button in the upper left corner to close the pop-up and return to the same "Tip" page. This allows more user control, addressing heuristic #3, and also helps with error prevention, addressing heuristic #6.

For the seventh task, managing notifications, the biggest heuristic to address was the third heuristic with user control and freedom and with the fourth heuristic regarding consistency and standards. Under the current interface, the "Notifications" option only lists the notifications previously pushed by the app. But when it comes to "Managing Notifications", this option is separated under "Settings" in the app. Therefore, these two options were consolidated so that all notification information would be consistent. The "Manage Notifications" menu was added on the "Notifications" page to allow users to determine specific notification preferences (Figure 7, Appendix). Users are given the option to toggle on and off general notifications, daily reminder notifications, such as those pushed to remind users to set and check off goals, and new challenge badge updates, which are pushed when a new goal challenge is released. This increases control for the user to manage their notifications while also keeping the location of all notifications settings consistent instead of separating the information within the app as was done in the original interface.

For the eighth task, use the support center, the biggest issue dealt with Heuristic #8, regarding flexibility and efficiency of use, and Heuristic #6, which was error prevention. The current interface support center navigates the user to an external website, the USDA ChooseMyPlate website. This external website simply has an email address users can select to email if they have any issues with the app. There are other tabs at the bottom of the page that give more information about MyPlate101 as well, along with a "Menu" of options on the website at the top of the website that is not locked for continuous user use. The user would have to scroll to the top or bottom of the page to select menu options to navigate for more support and/or information. Having to scroll across these pages, and having inconsistent options in each of the available menus, leads to easy errors for the user to make that would not be prevented and would not be an efficient user experience. Therefore, in the modified interface, this menu at the top of the screen is locked to allow efficiency in use on the particularly long pages on the website, helping with this task's low scoring on this eighth heuristic, and also by reducing the number of options for the user to pick between, thus helping with the sixth heuristic of error prevention. Furthermore, there is an unsightly yellow bar at the top of the screen that does not have any information or function but seems to be in error. In the modified interface, this bar was removed to help with the support center's scoring for aesthetic and minimalist design, which is the ninth heuristic (Figure 8, Appendix).

HYPOTHESES ON USER IMPACT

Based on the heuristic evaluation, the group hypothesized that these certain changes to the 8 tasks outlined in Phase I of the project would potentially improve the performance of the app. The first improvement of adding back buttons on most pages is a broad improvement to the whole app for the expressed reason of speeding up the navigation of the app by eliminating the time it would take to figure out how to navigate to the previous screen. It is hypothesized that this would allow users to recover easily from errors potentially made while completing assigned tasks, while also giving users more control and

freedom in how they choose to navigate the app. The second change was allowing users to select how many goals they want to set under the "Pick for Me" tab. This would allow the user to gain more satisfaction with the app by allowing them to control the amount of goals they want to set, giving more personalization and customization to the user. Furthermore, the edit button was altered by increasing the button's size and changing the button's background color in order to make it easier to access thus saving time and energy. This should present less of an obstacle to users when attempting to accomplish the editing goals task by increasing the visibility of this option on the goal screen.

A major change to the app is changing the "Pick for Me" button to the "Today's Goals" button after the goals are set. Altering the interface to install a new button and new way of interacting with the goals gives the user more control over the app and their health care experience. It decreases the burden in daily use of opening the app by decreasing the time it takes for the user to mark their goals completed, therefore allowing more repeatable use and allowing the app to be incorporated into a user's day easier.

Examples of challenge badges were added to provide tutorial since prior knowledge would have been needed to operate the challenge badges. This allows users to see that the challenge badges would operate similarly to the Goals Badges currently in place. This should help clarify any confusion that would come about while completing the browse badges task.

Another major change was turning the "About" page into a pop-up screen where an exit button was added to take the user back to the tip page instead of the home screen. This should help users with completing their goals as well, as they will be able to easily navigate tips while still being taken back to the goal checkoff badge without an unnecessary detour that was present in the original interface.

With respect to the consolidation of "manage notifications" under the notifications tab, having the settings consolidated should decrease user confusion on where to go to complete this task. The original interface would have users making a mistake by clicking the first "Notifications" option only to

find that this contains a list of previously sent notifications, not the settings for them. This placement was implemented in order to give the user more control over the system by putting all relevant information regarding notifications in one place so that users would not make this mistake, therefore it is hypothesized that the time it will take for the user to complete this task will decrease.

The final changes that were implemented were with respect to the support center. The minor change made was removing the yellow bar at the top of the screen that served no purpose. Aesthetically this was not pleasing, so to make the app more desirable the team removed it. This change promotes a better-looking interface in this aspect of the app, which implies that the user impact will be positive compared to the original interface, as aesthetics will affect the user's impression of the interface. Furthermore, the top menu was locked at the top of the screen to be easily accessible to users as they navigate the support center. This should allow greater user flexibility, and therefore it is hypothesized that this task will score higher for the modified interface as opposed to the current interface during the questionnaire and interview phases in the next phase of the project.

Overall, it is anticipated that the modified interface will decrease the amount of time it takes for a user to complete these tasks. Information was condensed to make it more concise and easier to locate. Easily visible back buttons will allow easier error recovery if a user makes a mistake while completing a given task. Furthermore, these improvements in aesthetics and user options should improve the scoring of the app in usability questionnaires. Similar improvements addressing these areas were made across tasks, so the overall scoring for the modified app interface is predicted to increase compared to the original design.

CONCLUSION

Many people in the United States are overweight and deal with chronic health issues as a result. The astounding number of people in America that deal with either health issues or simply a decreased

standard of living due to unhealthy lifestyle choices has impacts on the economy, the public health infrastructure, and many other areas of concern. The goal of the MyPlate app is to enable, encourage, and empower a population that is largely uneducated and unmotivated to make small, simple, and consistent changes to improve its health over the long term.

While the MyPlate app largely achieves this goal, there were clearly some usability issues within the app. In general, these issues revolved primarily around navigation and user freedom. Adjustments were made to alleviate these issues. While changes made to the app could certainly have been more complex or more all-encompassing, the goal was to improve the app without negating the "simple" in "Start Simple with MyPlate". The modifications completed in this phase of the project streamlines the MyPlate user experience while staying true to the goal of simple, consistent, healthy changes to improve one's life. It is hypothesized that users will be able to notice these improvements in their ease in completing the tasks under investigation. The next and final phase of the project aims to support these hypotheses through a quantitative investigation on the impact of these improvements through user interviews and questionnaires.

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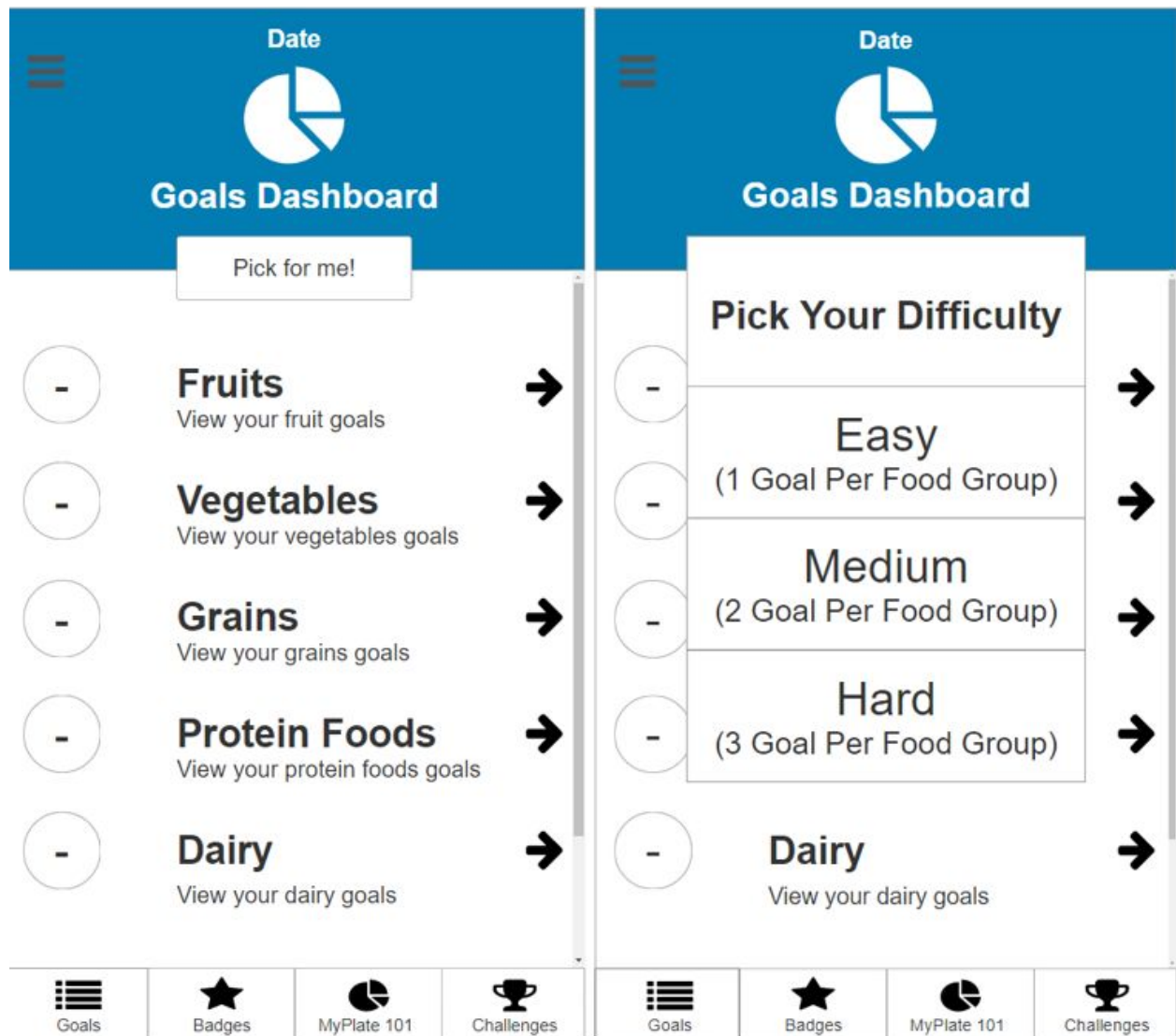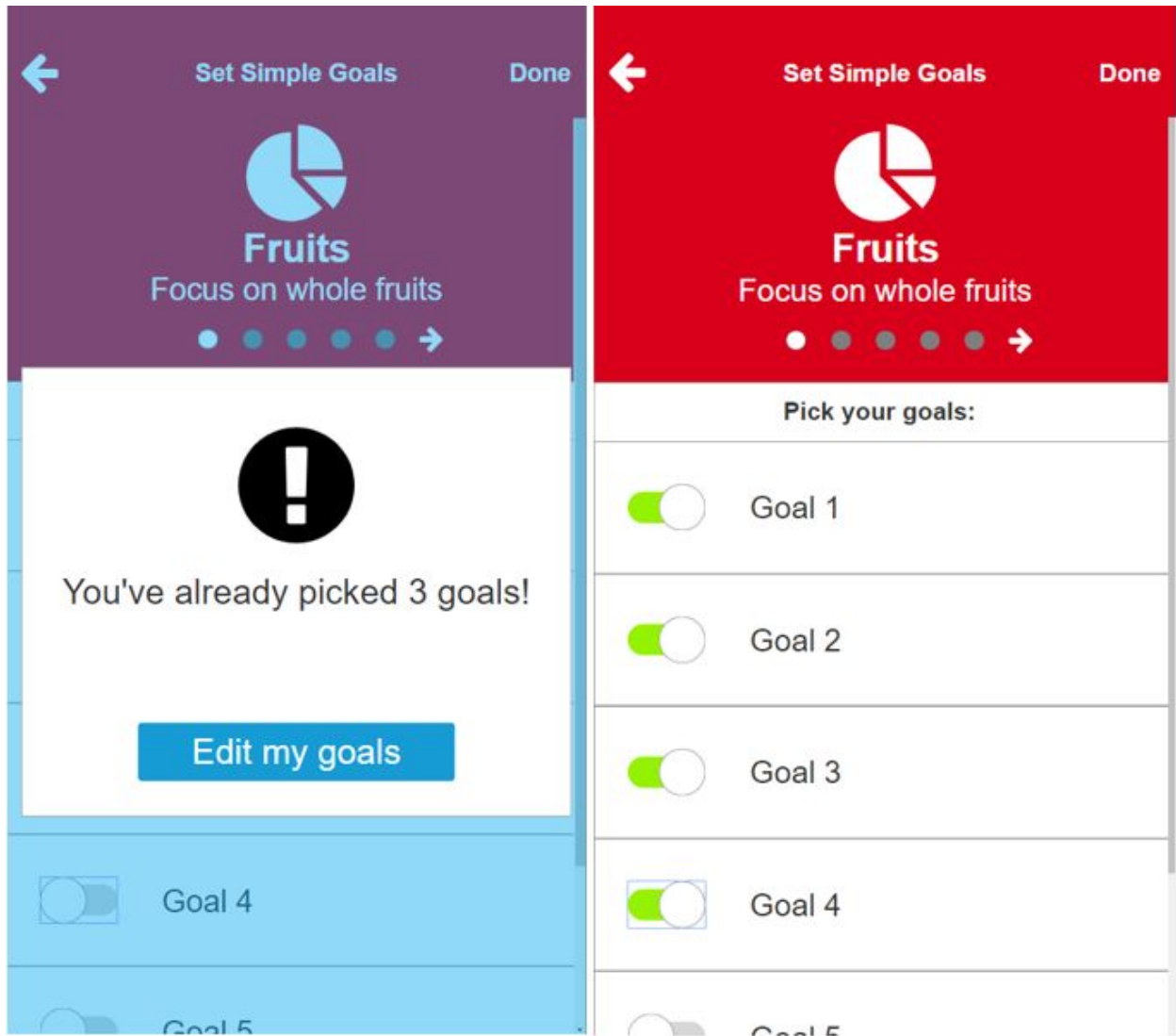introduction/nutrition-and-health-are-closely-related/
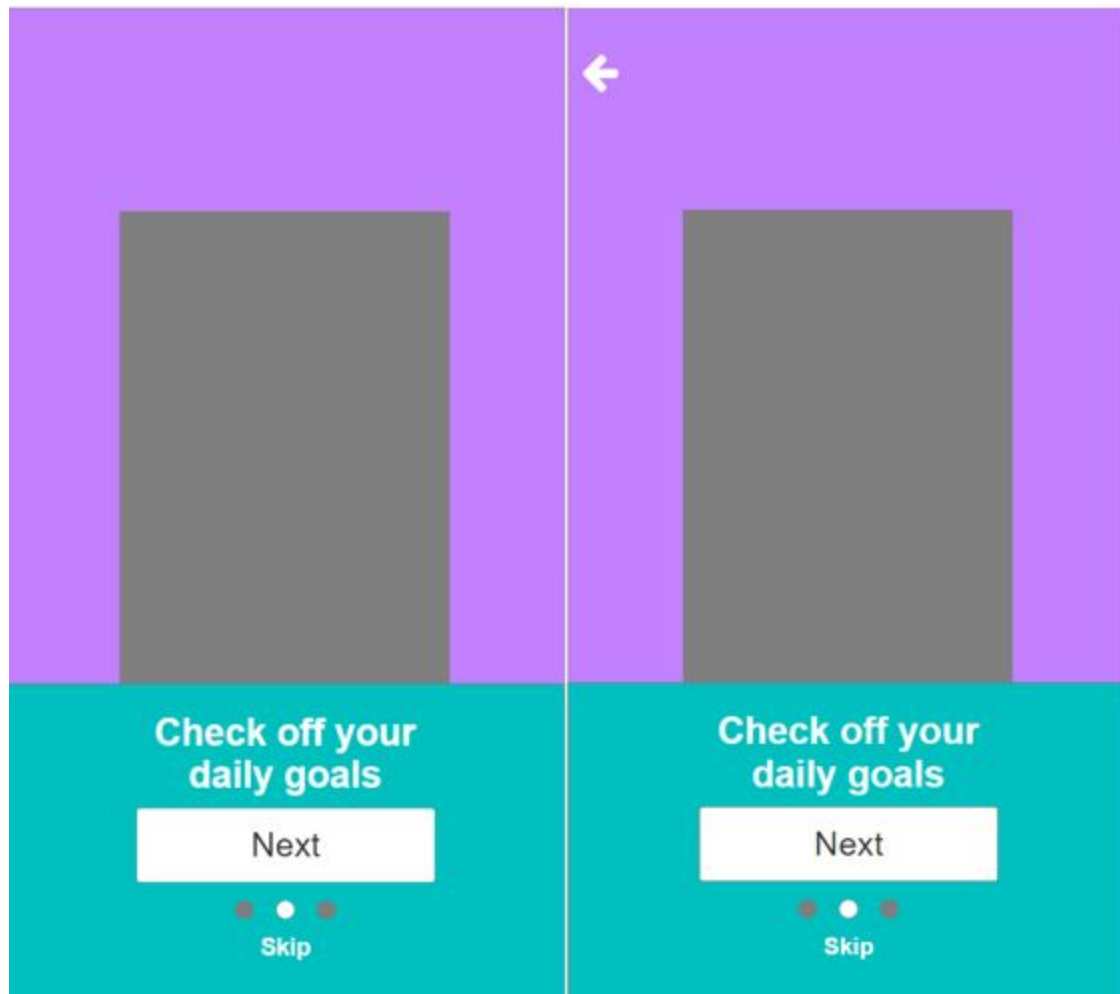
Figure 1: The original initialization interface prototyped in Axure, left, with the modified interface

prototyped in Axure on the right. Note the addition of the back button in the upper left corner
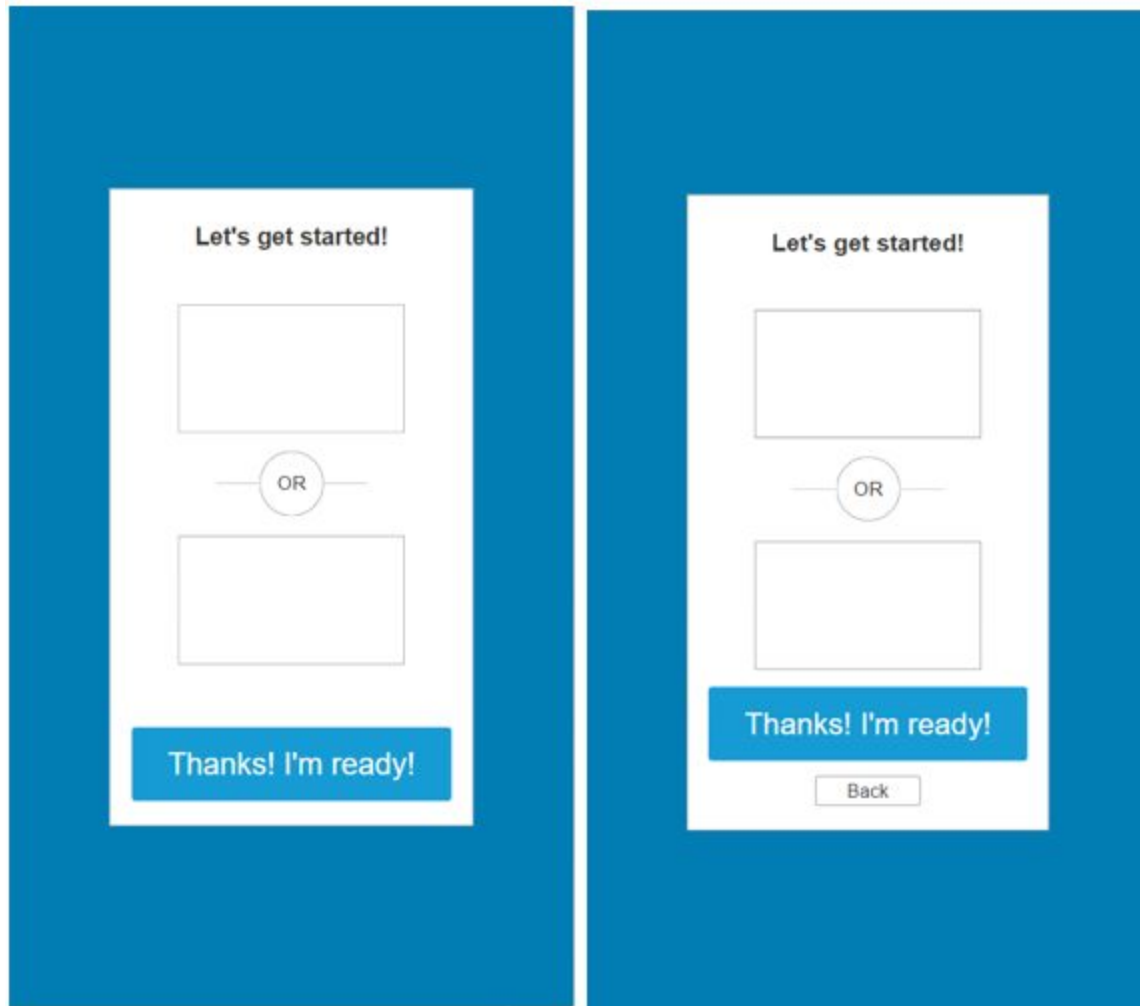
Figure 2: The original initialization interface prototyped in Axure, left, with the modified interface prototyped in Axure on the right. Note the addition of the back button under the "Thanks! I'm ready!" button in the main pop-up.

Figure 3: The original initialization interface prototyped in Axure, left, with the modified interface prototyped in Axure on the right. Note the additional pop-up asking the user for how many goals they wish to be assigned, as opposed to the original interface which automatically assigns one goal per group.

Figure 4: The original initialization interface prototyped in Axure, left, with the modified interface prototyped in Axure on the right. Note the limit on the number of goals set has been removed, and no pop-up is shown in the modified interface after selecting a fourth goal in a category.
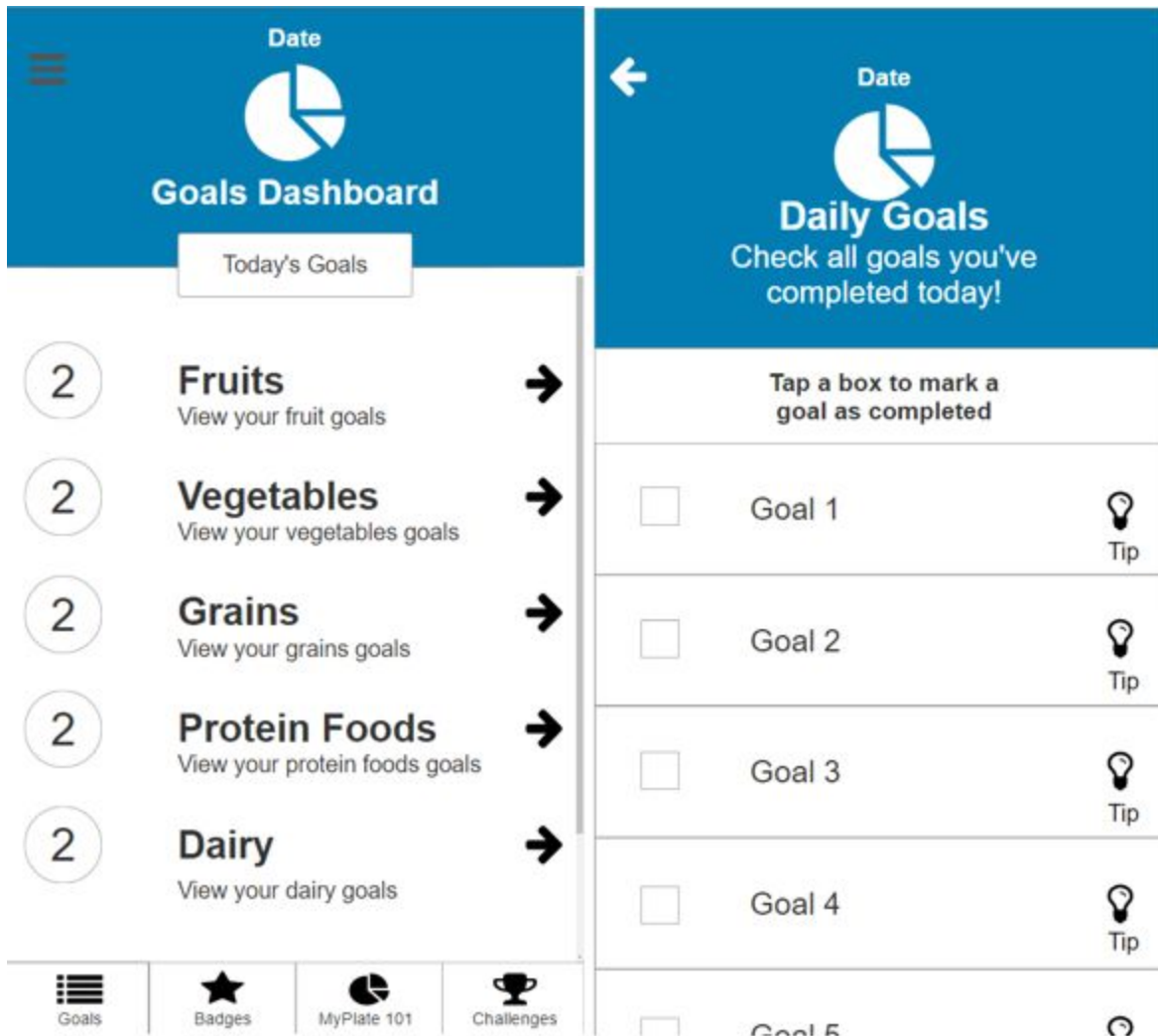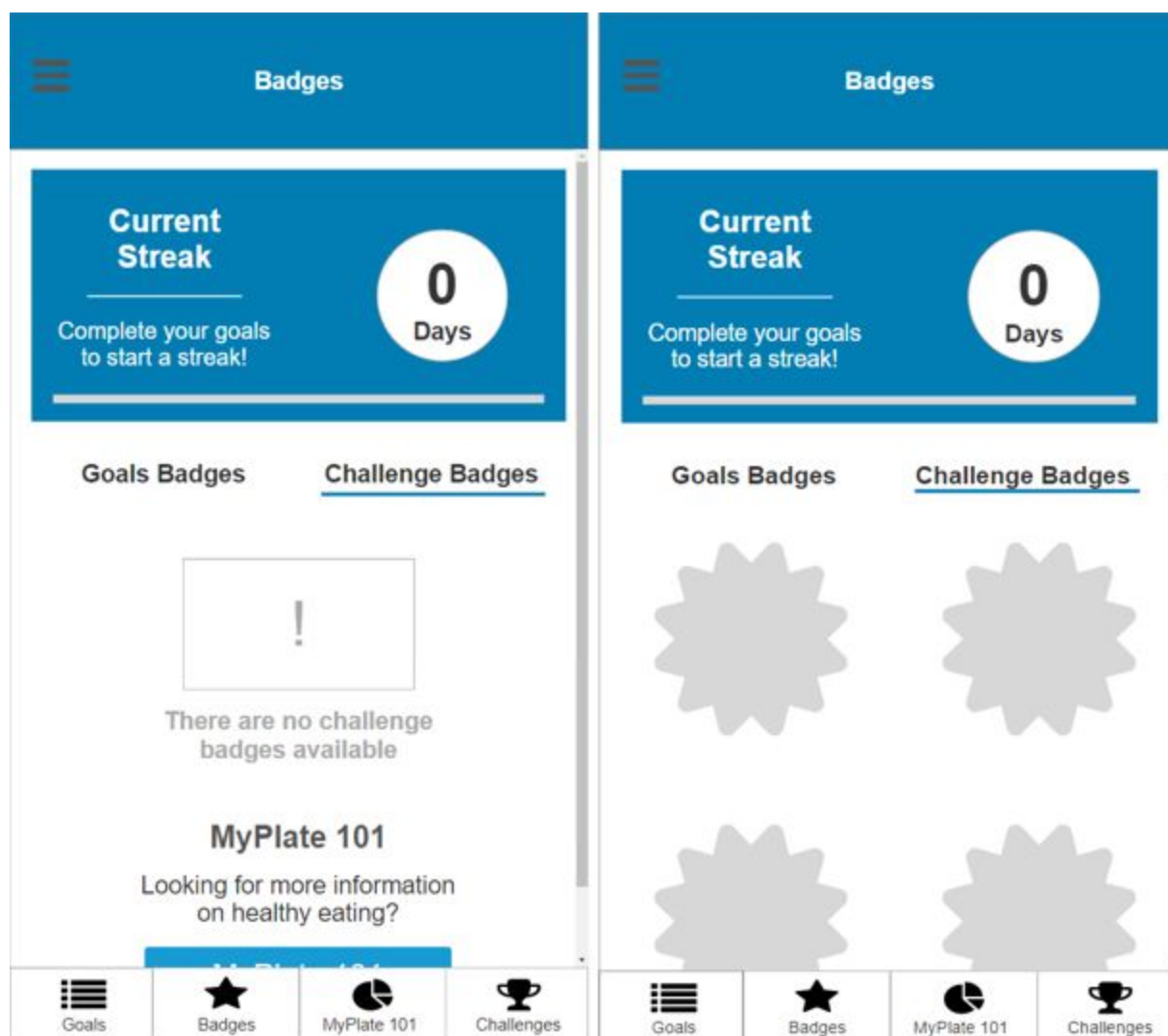
Figure 5: The modified interface prototype done in Axure, illustrating the addition of the "Today's Goals" button, left, and the new "Daily Goals" list shown after clicking this button, right

Figure 6: The original initialization interface prototyped in Axure, left, with the modified interface prototyped in Axure on the right. Note the addition of challenge badges to complete the development of this app.
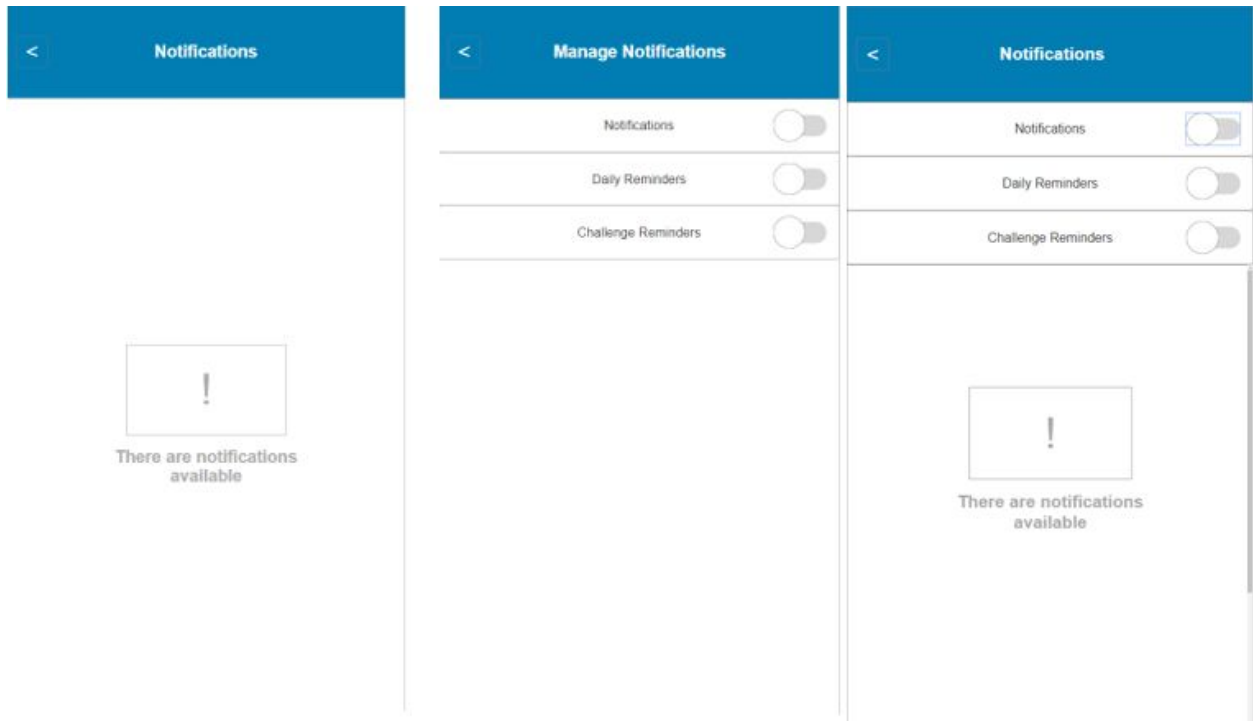
Figure 7: The original initialization interface prototyped in Axure, left and center, with the modified interface prototyped in Axure on the right. Note that the original interface had two separate notification locations, with the modified interface condensing these two screens into one menu
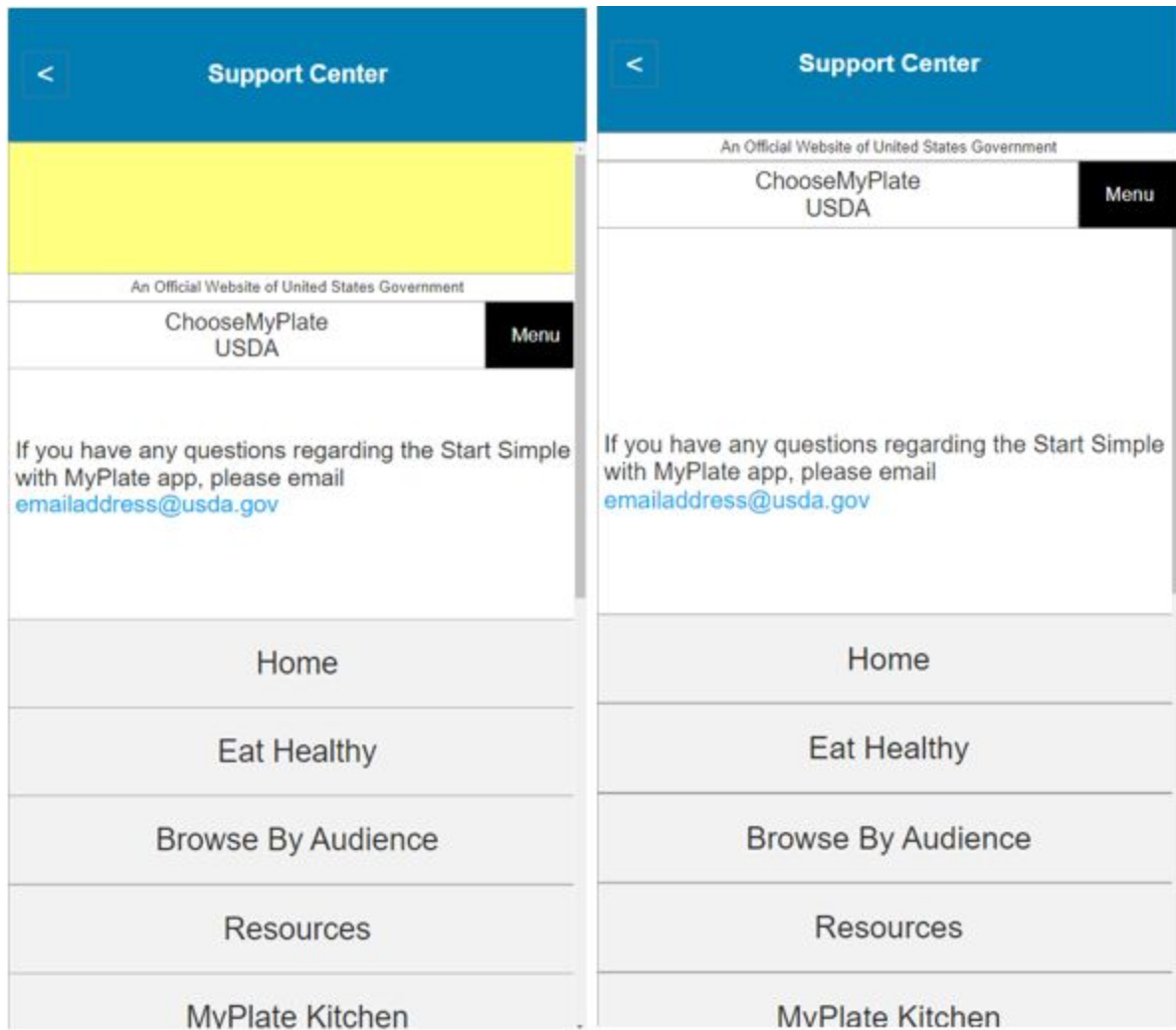
Figure 8: The original initialization interface prototyped in Axure, left, with the modified interface prototyped in Axure on the right. Note the removal of the yellow bar at the top; the top "Menu" bar is also now locked at the top of the screen even after the user scrolls down the page