Grommet Theme Designer

M4: Prototype

Bryan Jacquot
Iowa State University

HCI598
Spring 2016

Prototype Strategy

The initial prototype I began for the M4 deliverable was high-fidelity and fully interactive in HTML. I had the skeleton of the prototype in place and was adding the ability for users to customize the theme. At that point, I encountered a technical hurdle that is solvable, but it was not realistic for me to overcome within the timeline of this project. As a result, I changed my prototyping strategy and went to a lower-fidelity prototyping technique. This allowed me to deliver the prototype on time with ample content to collect feedback on the design.

I created the Grommet Theme Designer low-fidelity prototype using the Balsamiq digital prototyping tool (https://balsamiq.com/). Balsamiq is a tool I've used for several years, and I'm familiar with its interface and capabilities. I chose a lower-fidelity prototype because of the challenges I encountered with a high-fidelity prototype. I have also learned that when I create high fidelity prototypes, I tend to spend inordinate amounts of time fine tuning the system in ways that are not necessary for gathering early feedback. In addition, as Walker et al's research showed, "low- and high-fidelity prototypes are equally good at uncovering usability issues" and "designers should choose whichever medium and level of fidelity suit their practical needs and design goals" (Walker, 2002, p. 661).

The other benefit of using Balsamiq is its capability to create interactive PDF files. This allows users to interact with the system offline, and allows me to submit the prototype both online and offline formats.

Once the prototypes were ready for gathering feedback, I uploaded them to the InVision online prototyping platform (http://www.invisionapp.com/). InVision allows prototypes to be linked together with hotspots turning what would otherwise be static mockups into an interactive experience. This allows subjects to interact with the system in a way that feels somewhat realistic. However, there are limitations with this approach. For example, on the screen where users select colors, they can only pick from a few colors as prototyping screens for every possible color is not practical.

I chose to create a digital prototype because at least half of my usability test subjects will be remote. Using InVision will allow them to interact with the prototype from anywhere in the world. While I appreciate the value of paper prototypes, I find the most value in paper prototypes when I can interact with the test subject in person.

At this phase, the prototype's purpose is for formative evaluation to "improve the design" of the system (Dix, 2004). I'm using the prototype to improve the design before it is implemented. According to Dix, this type of prototype would be considered "throw-away" since the prototype is used to gather feedback and improve the design, but the actual content of the prototype will not be used beyond the usability testing.

The prototype may be accessed on InVision at the following location: https://invis.io/ZG6CFJX69.

User Stories

Before jumping into the prototype, the following user stories describe the capabilities which will be offered by the Grommet Theme Designer.

I. Foundation
   a. As a designer, I need to efficiently create a theme for a web application.
   b. As a designer, I need to preview a sample application using my theme.
   c. As a designer, I need to share my theme with stakeholders and developers.
   d. As a designer, I need to download my theme for use in Sketch.
   e. As a developer, I need to preview the theme and provide feedback to the designer.
   f. As a developer, I need to download the theme for use in the Grommet application development platform.

II. Color
   a. As a designer, I need a primary color to be suggested.
   b. As a designer, I need to specify a primary color based on my customer's brand.
   c. As a designer, I need to fine-tune suggested primary and secondary colors.
   d. As a designer, I want to be notified when colors lack differentiation by users with color deficient vision.
   e. As a designer, I want to be notified when colors lack adequate contrast to meet accessibility standards when text is placed on top of colors in my palette (e.g. in buttons).

III. Fonts
   a. As a designer, I need to select a font family.
   b. As a designer, I need to browse fonts for use in my application.
   c. As a designer, I need to preview and fine tune the typographic scale.

IV. Element style
   a. As a designer, I need to adjust the corner radius of buttons and controls.
   b. As a designer, I need to adjust the depth of controls to provide either a flat or 3d appearance.
   c. As a designer, I need to set the line weight within icons.
   d. As a designer, I need to set the line-end style within icons.

V. Design tool
   a. As a designer, I need to import my theme into Sketch so I can design my application using my theme without manual entry of my theme settings.

The Prototype

The majority of the user stories described in the previous section have been prototyped in the following screens. Figure 1 is the home screen of the Grommet Theme Designer. This screen, designer can perform all use cases except the last user story which is provided within the Sketch design tool. Prototypes for the last user story are presented at the end of the paper.
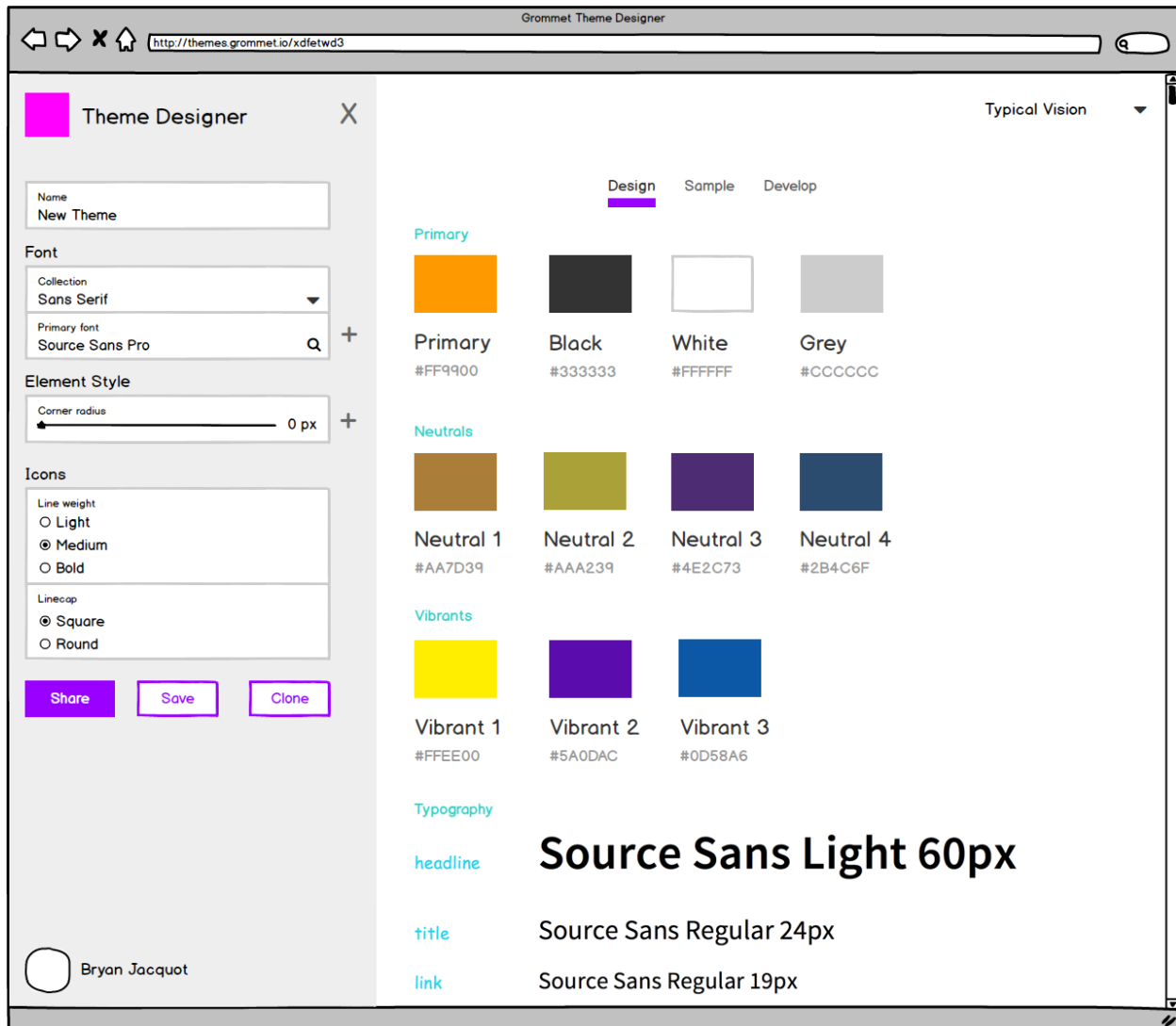

Figure 1. Grommet Theme Designer home page

When a user clicks on a color in the previous screen, Figure 2 appears. The color editor sidebar on the right provides designers with the ability to chose colors based on a color picker that is familiar to designers.

Based on peer review feedback as part of the M3 deliverable from Briana, this is the area I'm considering adding richer descriptions of colors, such as "warmer", "cooler", or "edgy" and having the theme designer randomly select a color within that context. Another element that could be added here is the ability to upload a photograph and the Grommet Theme Designer would generate a color palette based on colors drawn from the photo. These have not been prototyped, but I appreciate the feedback and agree this would be a nice addition in the future.
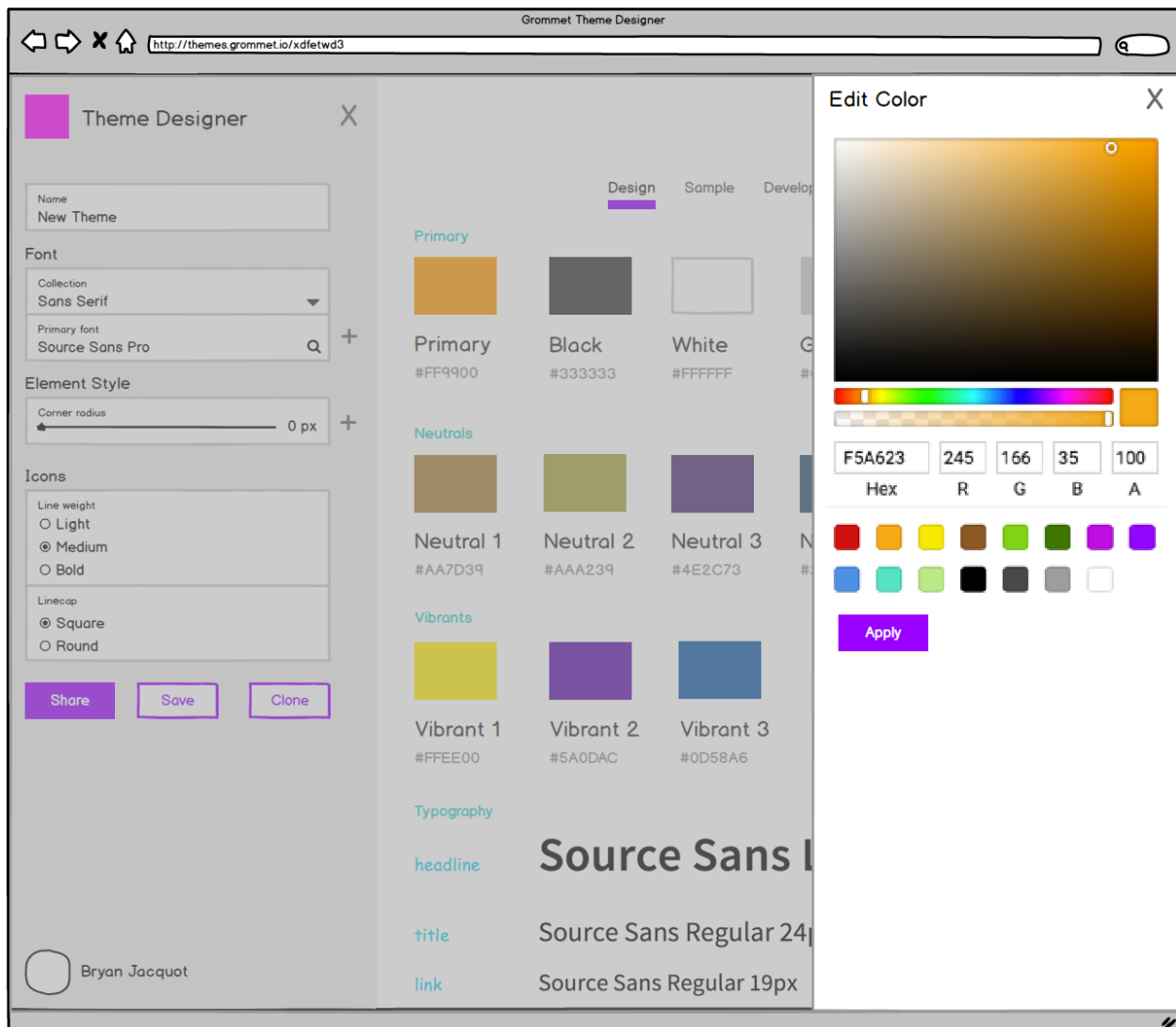
Figure 2. Color editor

Once the user selects a new primary color, the entire color palette changes using two tetrad algorithms to provide a harmonious color palette. One tetrad palette is used for the one primary color and three vibrant colors. The other tetrad palette is used for the neutral colors. The same seed color is used, but it is darkened to lessen to provide more neutral colors. A resulting color palette is show in Figure 3 as if the user changed the primary color to purple.

Upon selecting a new color, the Grommet Theme Designer will analyze the color palette to ensure it meets accessibility guidelines.   In this case, the alert shown in the upper right is an invitation to the user to investigate the colors more thoroughly to ensure the palette will meet all their users' needs.

I didn't prototype modification of all colors in the palette. I prototyped customization of the primary color, and believe users will extrapolate that experience for all the colors in the palette.
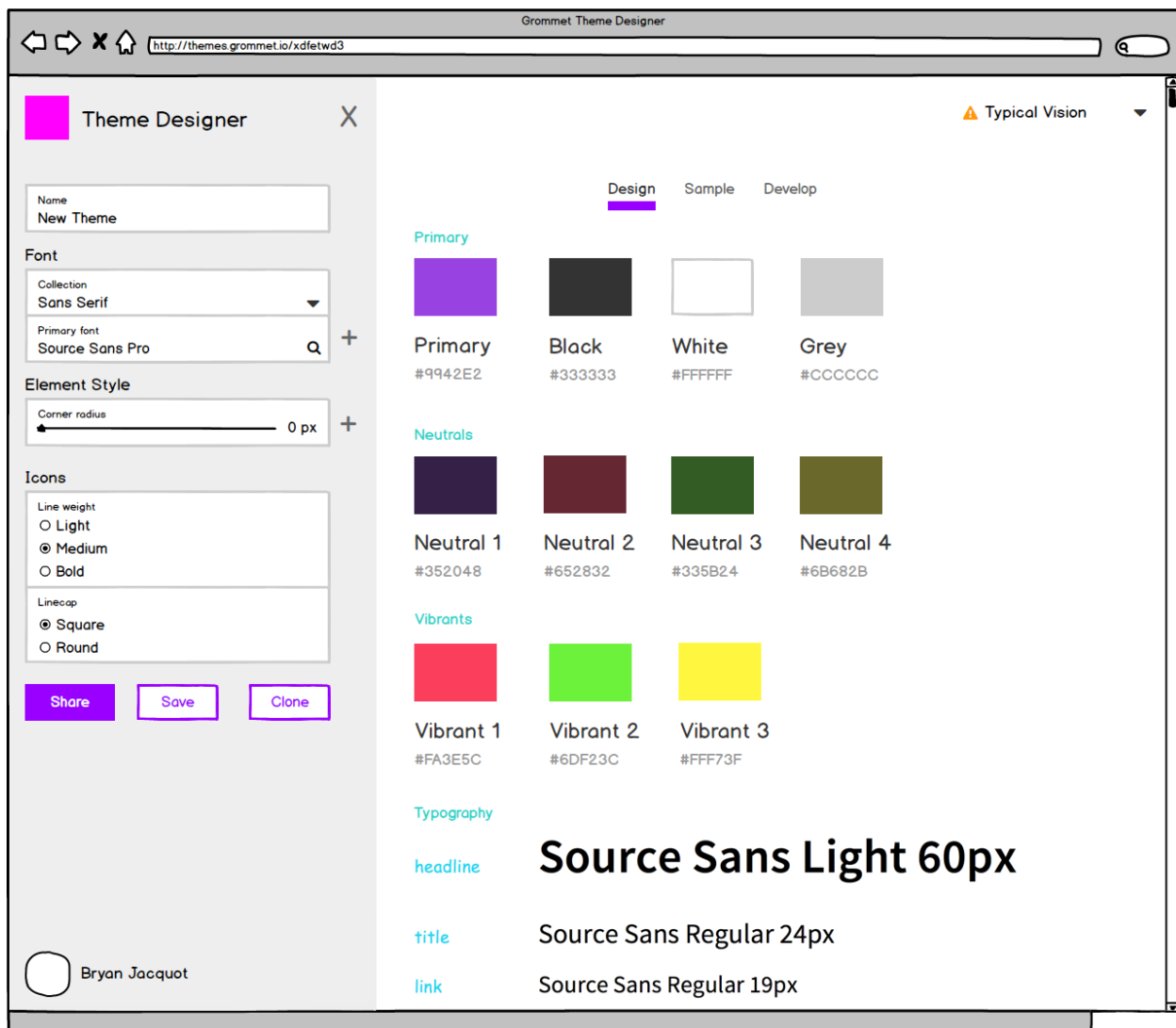

Figure 3. Home page with color blindness alert

When the user opens the Typical Vision menu shown in Figure 4, the types of color blindness defined by the National Eye Institute (National Eye Institute, 2015) are available to be simulated within the color palette. Should a form of color blindness expose the end user with an inability to perceive unique colors in the palette, they are highlighted with an alert icon in the menu as Rod monochromacy is in this case.
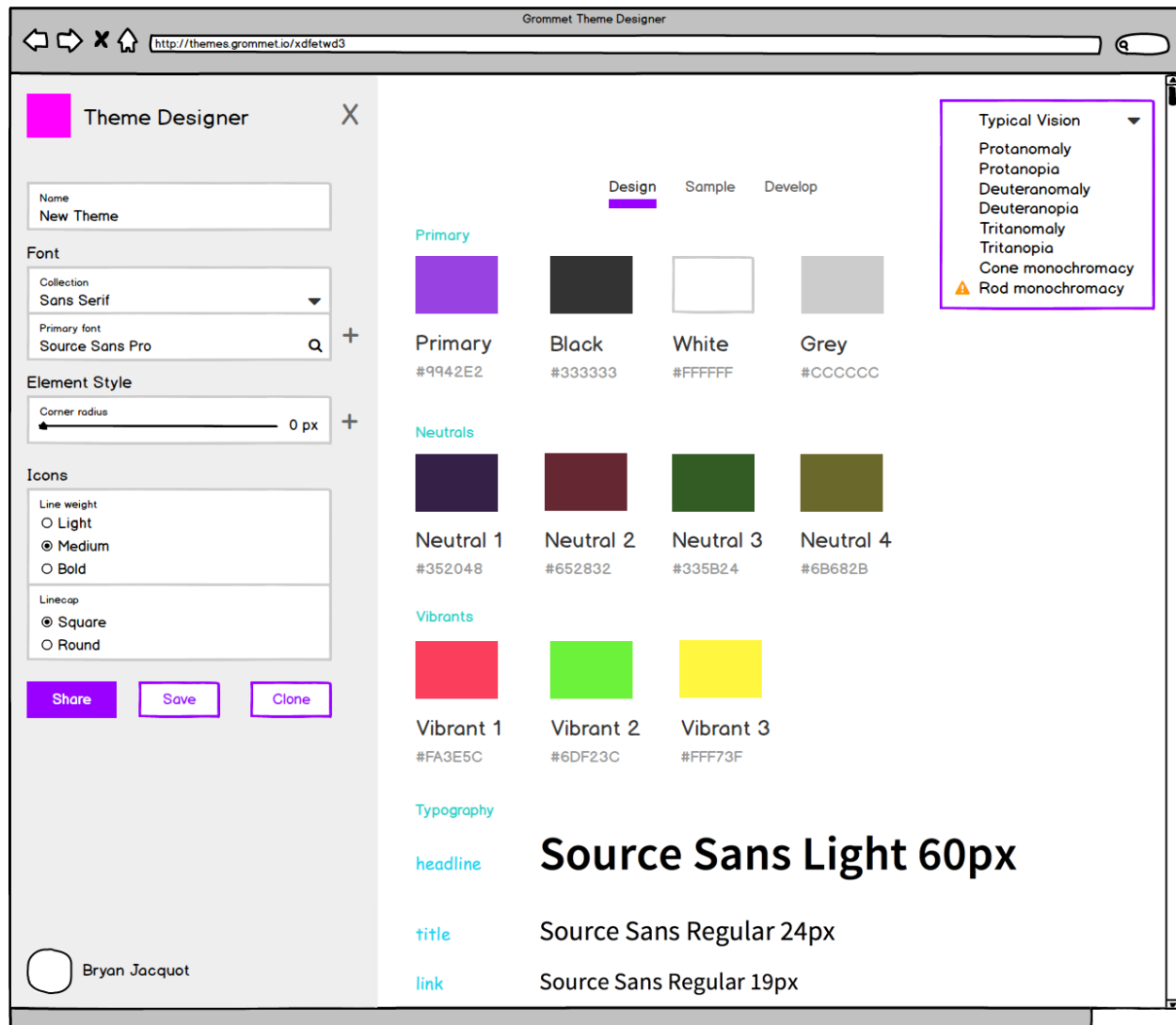

Figure 4. Menu allowing designers to simulate the types of color blindness with alert indicator

Upon selection of a color blind simulation, the color palette changes to simulate what users who have that condition would see. Figure 5 is an example of a rod monochromacy simulation which is the most severe type of color blindness and leaves affected individuals without the ability to see any colors. The notification on this page provides background for the deficiency as well as an indication for the colors causing the concern.

As was pointed out by Briana in her peer review, this feature has appeal beyond awareness of the primary stakeholder. "This system has an opportunity to encourage conversation with clients regarding accessibility and change their perspectives. There is a strong social implication here, and Grommet could deliver tips to designers for tackling that conversation with clients – or, as it seems to currently be under test within Bryan's company, encourage conversations internally about how they might tackle this if Grommet informs them of an accessibility issue" (Bettin, 2016, p. 2).
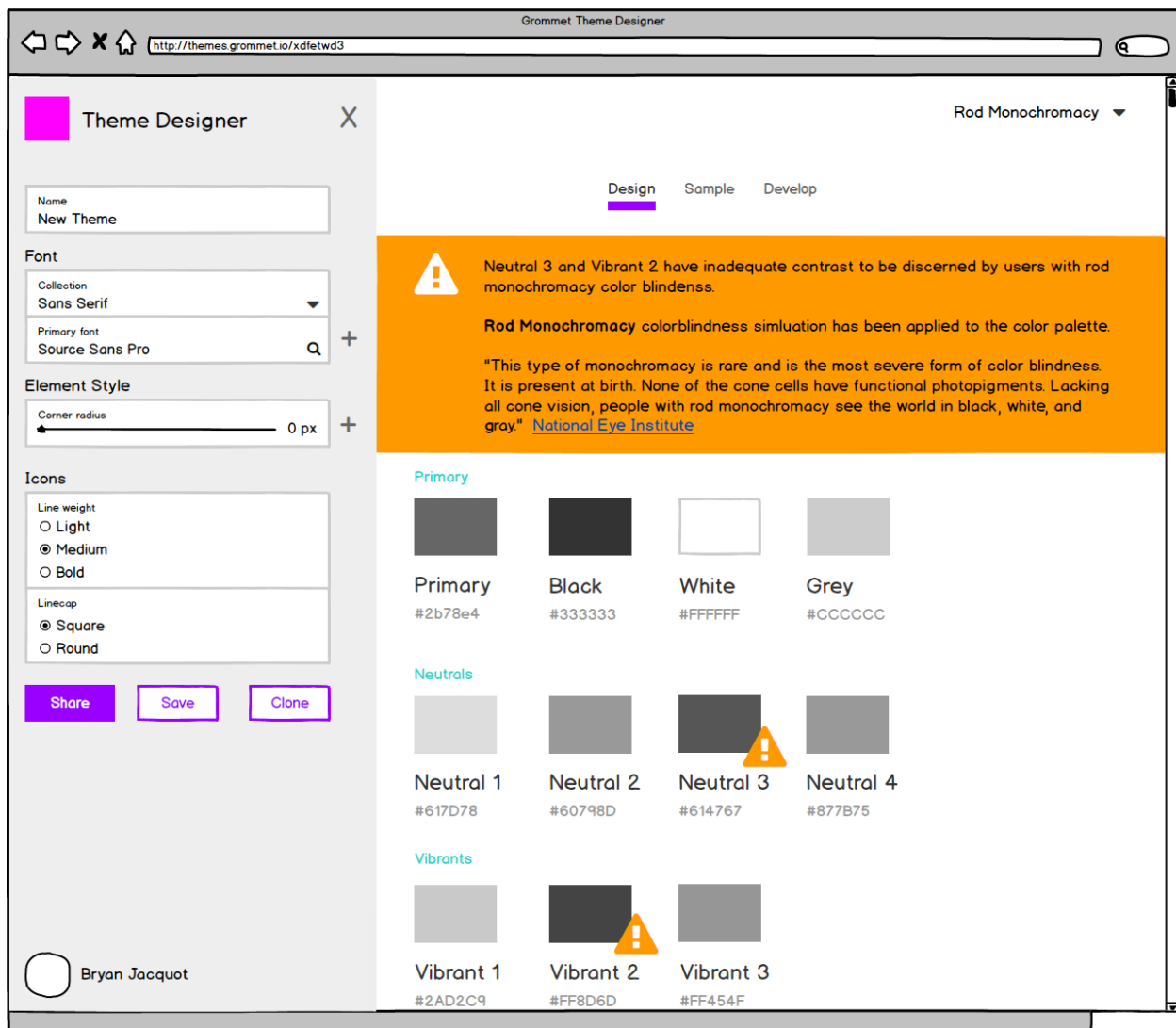

Figure 5. Color blindness simulator of rod monochromacy

Figure 6 shows another type of colorblindness simulation, protanomaly, which changes the colors the user sees, but doesn't completely prohibit perception of color. The colors shown in Figure 6 are actual simulations of colors show in Figure 4.
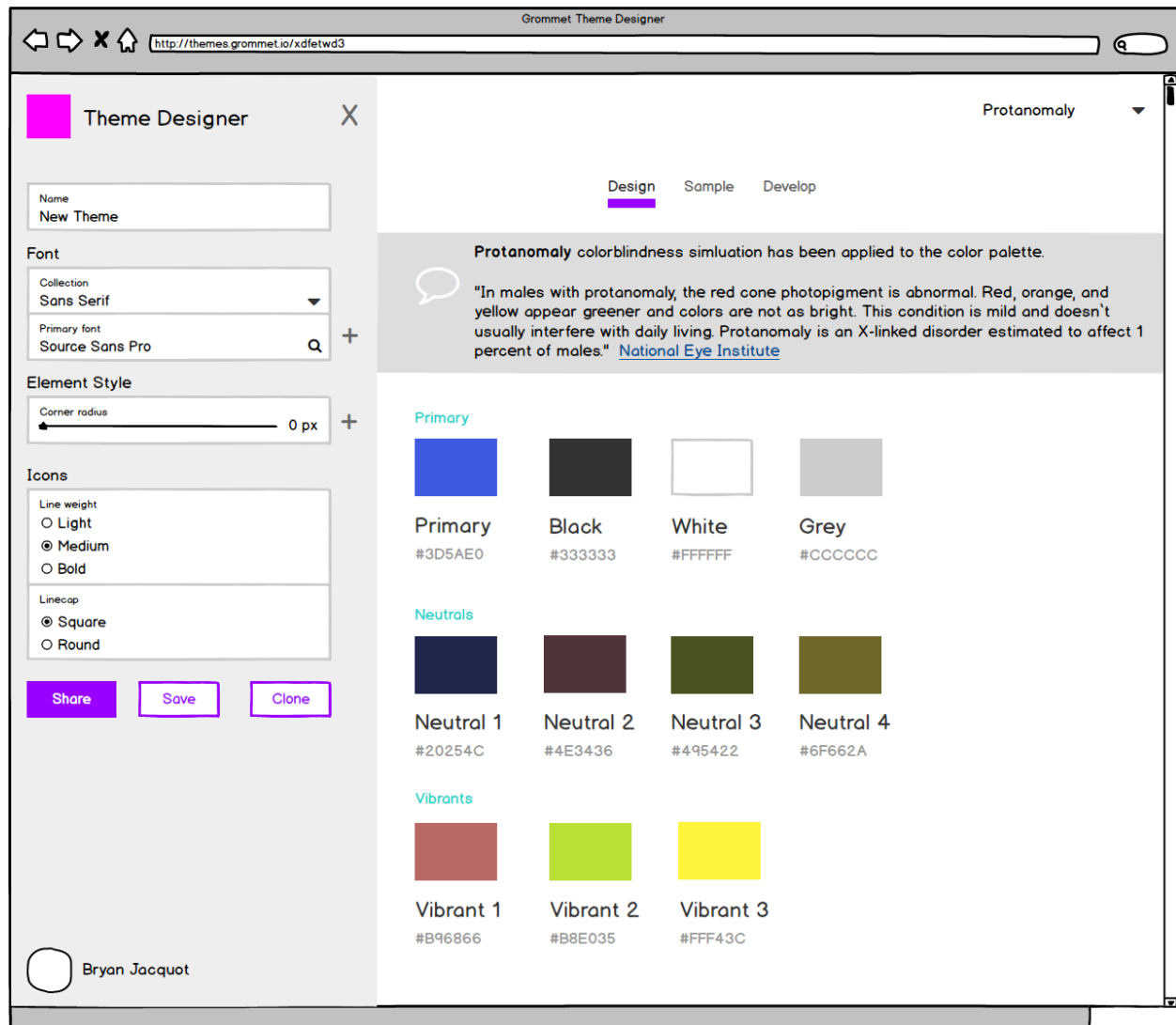

Figure 6. Color blind simulation of protanomaly

When designers select their primary color, the primary color is frequently used throughout their websites and web applications for controls such as buttons, tabs, selection, etc. As a result, it's important to ensure that the primary color meets accessibility guidelines with both dark and light text. If either of the text colors do not meet the WCAG 2.0 AA rating, then the Grommet Theme Designer will alert the user to this, as shown in Figure 7.

It's important to note that the designer may chose to ignore this alert and always use dark text, in this example, for controls that use the primary color.
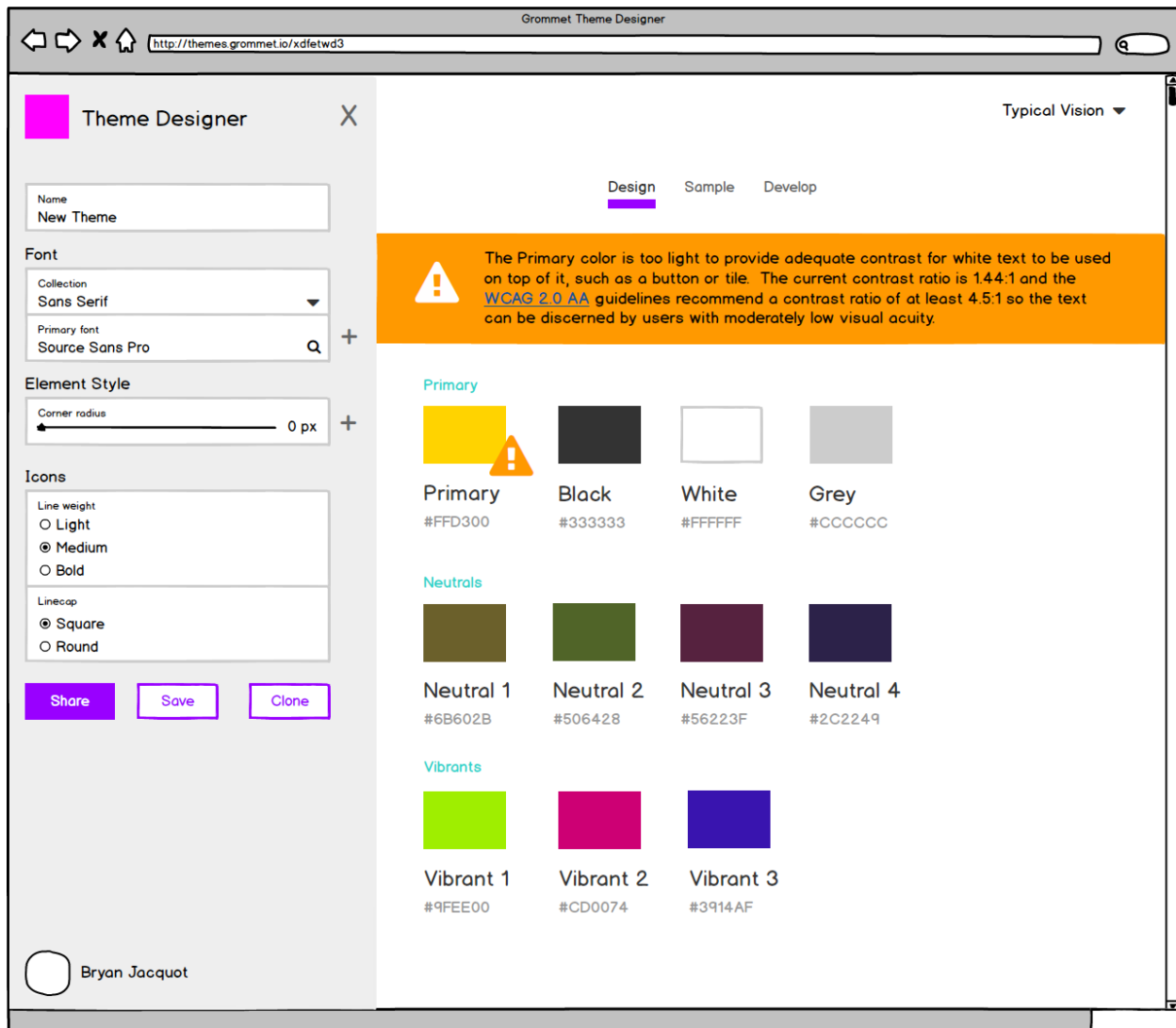
Figure 7. Alert for inadequate contrast if white text is used over the selected primary color

The Grommet Theme Designer allows users to select fonts from the Google Font Service. First, the designer selects the desired collection of fonts from which to chose their primary font. This capability is shown in Figure 8.
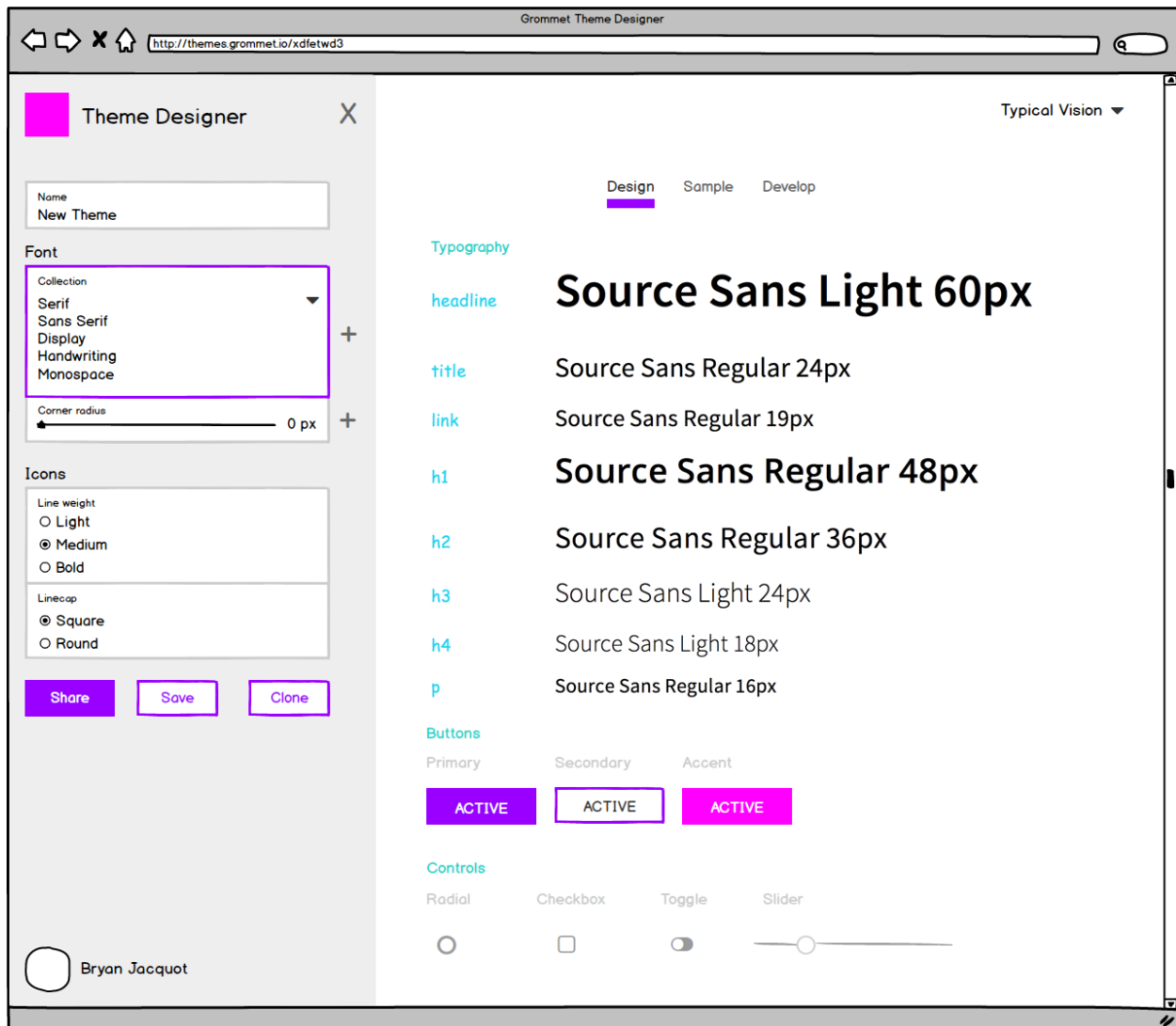

Figure 8. Font collection selection

After selecting a font collection, the user can select the primary font as shown in Figure 9. Users are able to search for fonts by name if they know which they are looking for, or they can browse through the fonts in the menu with each entry being styled with the corresponding font.
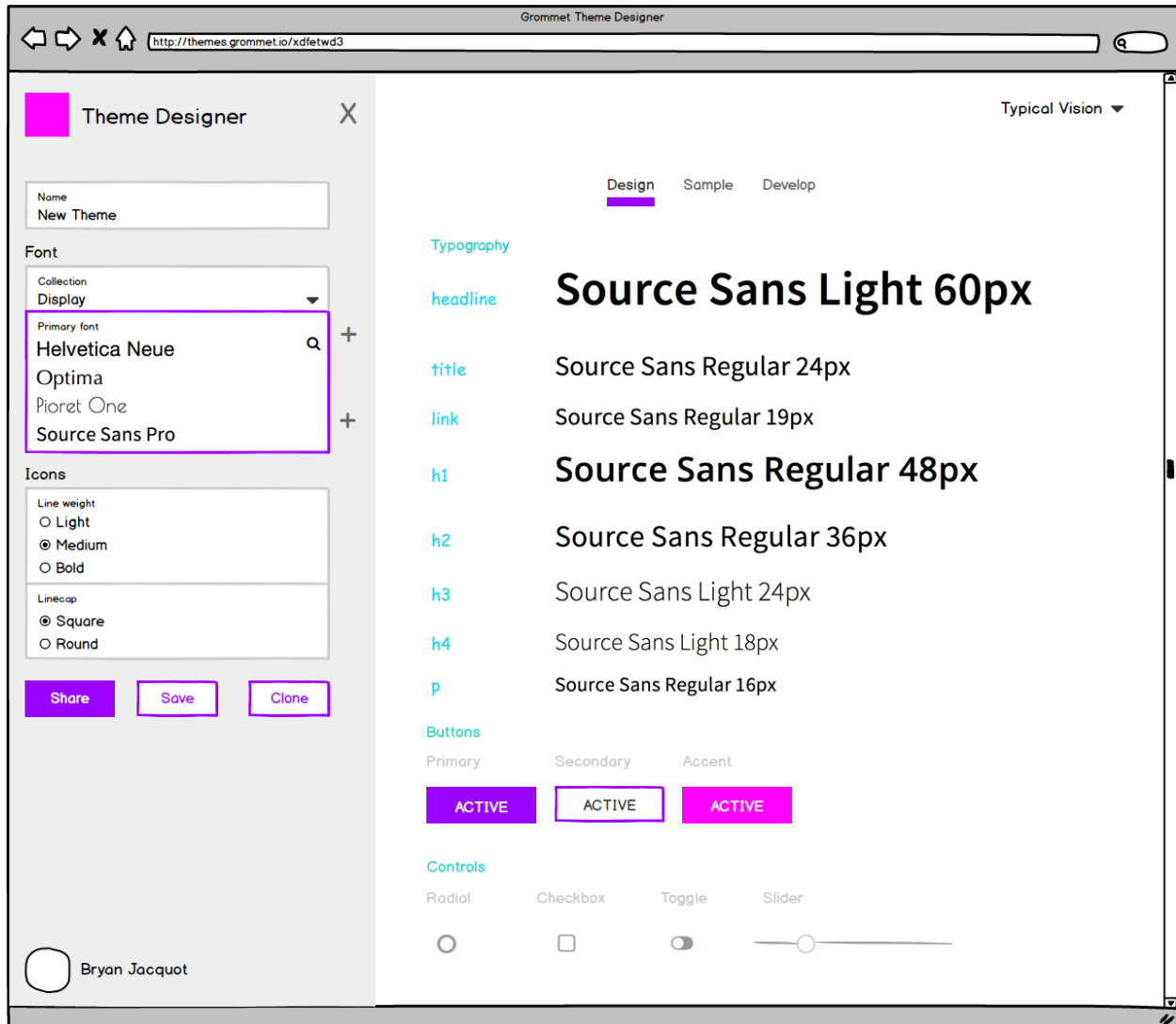

Figure 9. Primary font selector

After the user selects a primary font, then the body of the Grommet Theme Designer webpage updates with the selected font in the typographic scale. Figure 10 shows an example of the updated screen.

The list of user stories suggests the interface will allow designers to fine tune the typographic scale. While this is expected to be a feature of the final product, this feature was not prototyped. I will be watching for designers who attempt to customize the typographic scale during my usability study to validate the importance of this capability.

Another feature that is not functioning in the prototyped is the "+" icon to the right of to the primary font search input. This feature will allow designers to add a secondary font. In my initial research, I found this feature is commonly used by designers, so it is expected this will be part of the final product.
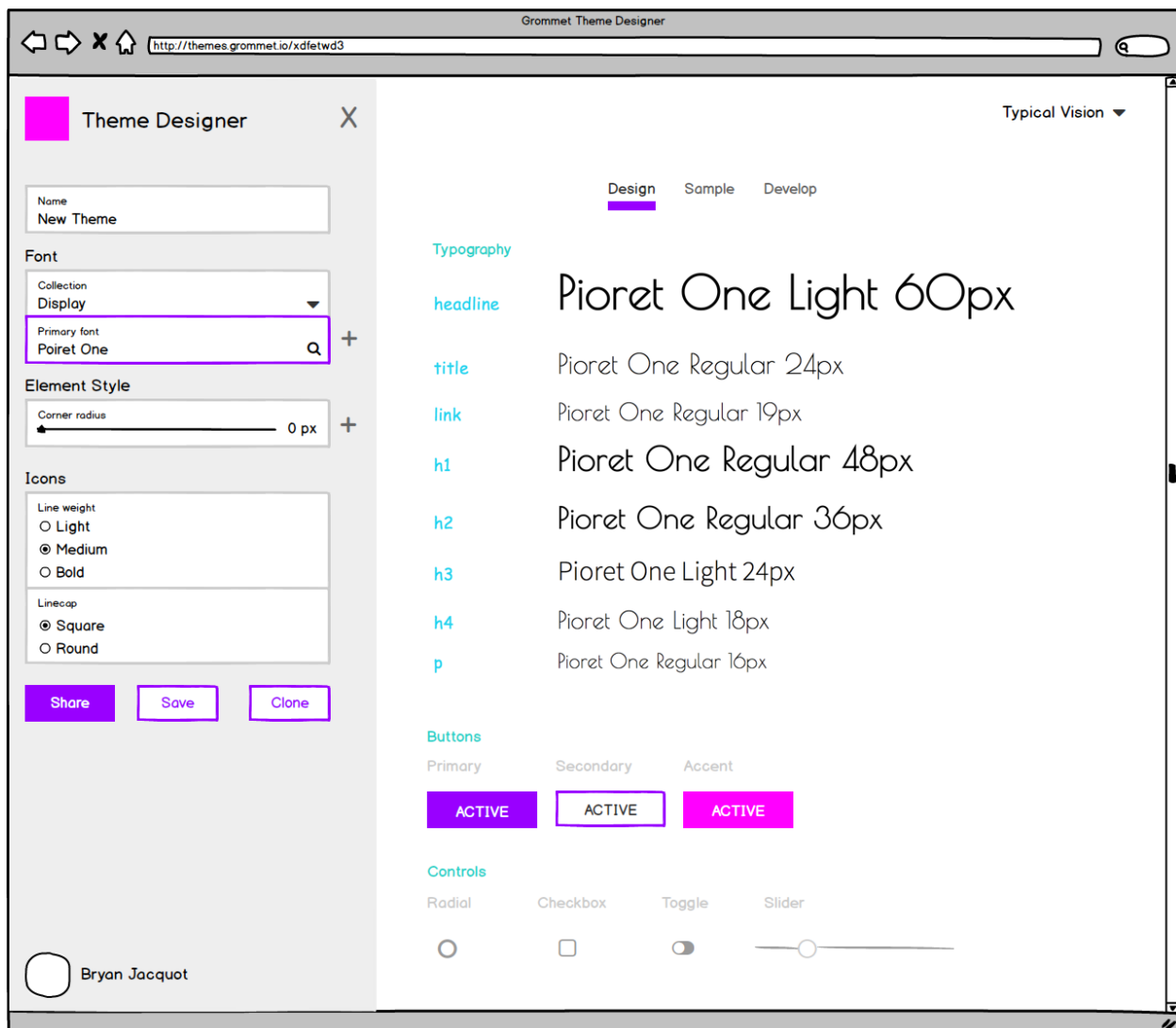

Figure 10. Typographic scale after primary font is changed

Designers can customize the element style by selecting the corner radius. When adjusting this slider shown in Figure 11, the buttons in the primary workspace will update their shape accordingly.
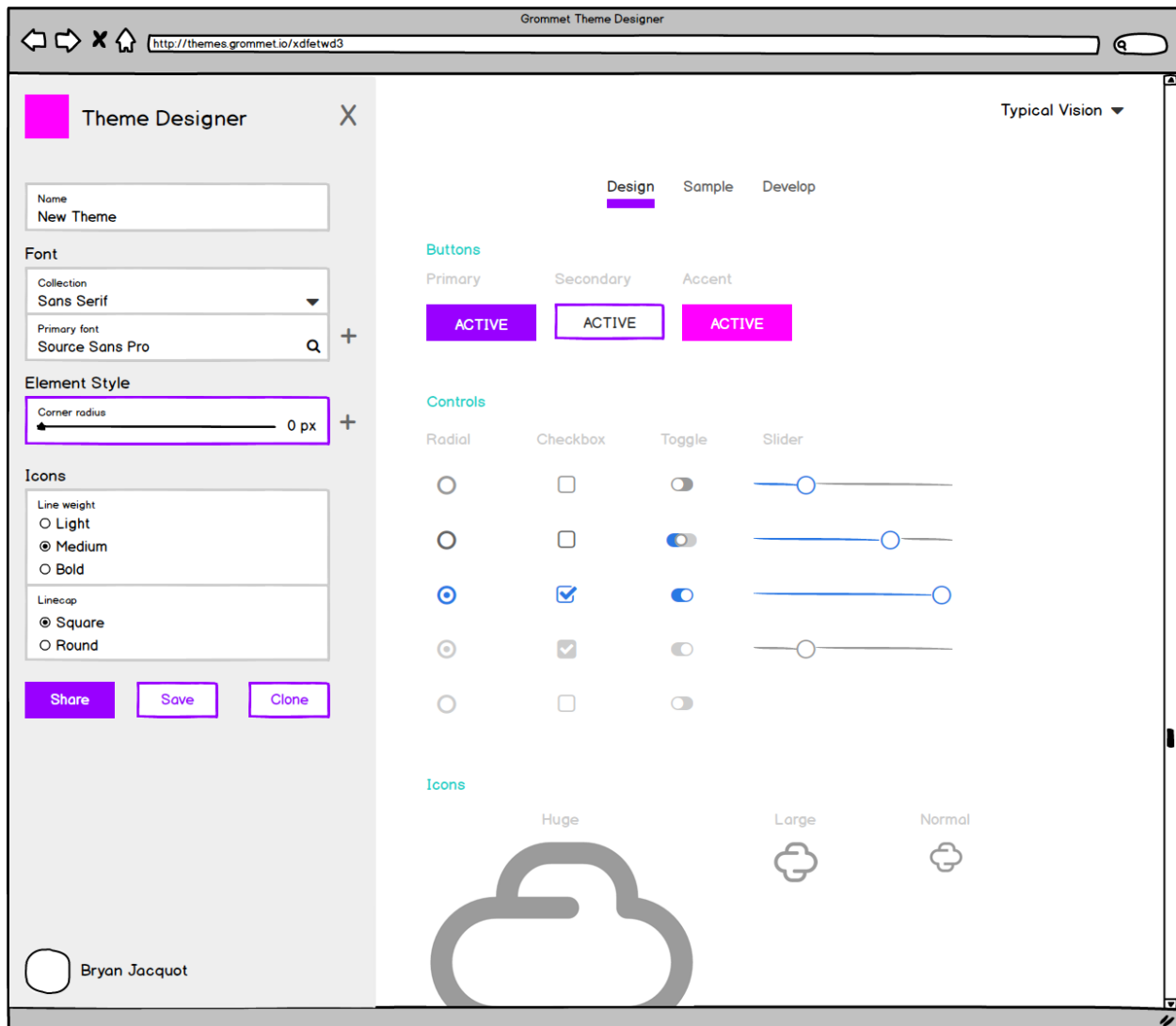

Figure 11. Button styling with no corner radius

Figure 12 shows the resulting button shapes after changing the radius to 10px. The buttons' appearance changes pretty dramatically with this simple control.

This screen shows a feature that has not been prototyped. The "+" icon to the left of the corner radius form field allows designers to individually control the button radius if they happen to be different on each corner of the shape.   This feature is expected to be rarely used, but my former employer, HP, had differing corner radius's on their buttons and other controls.
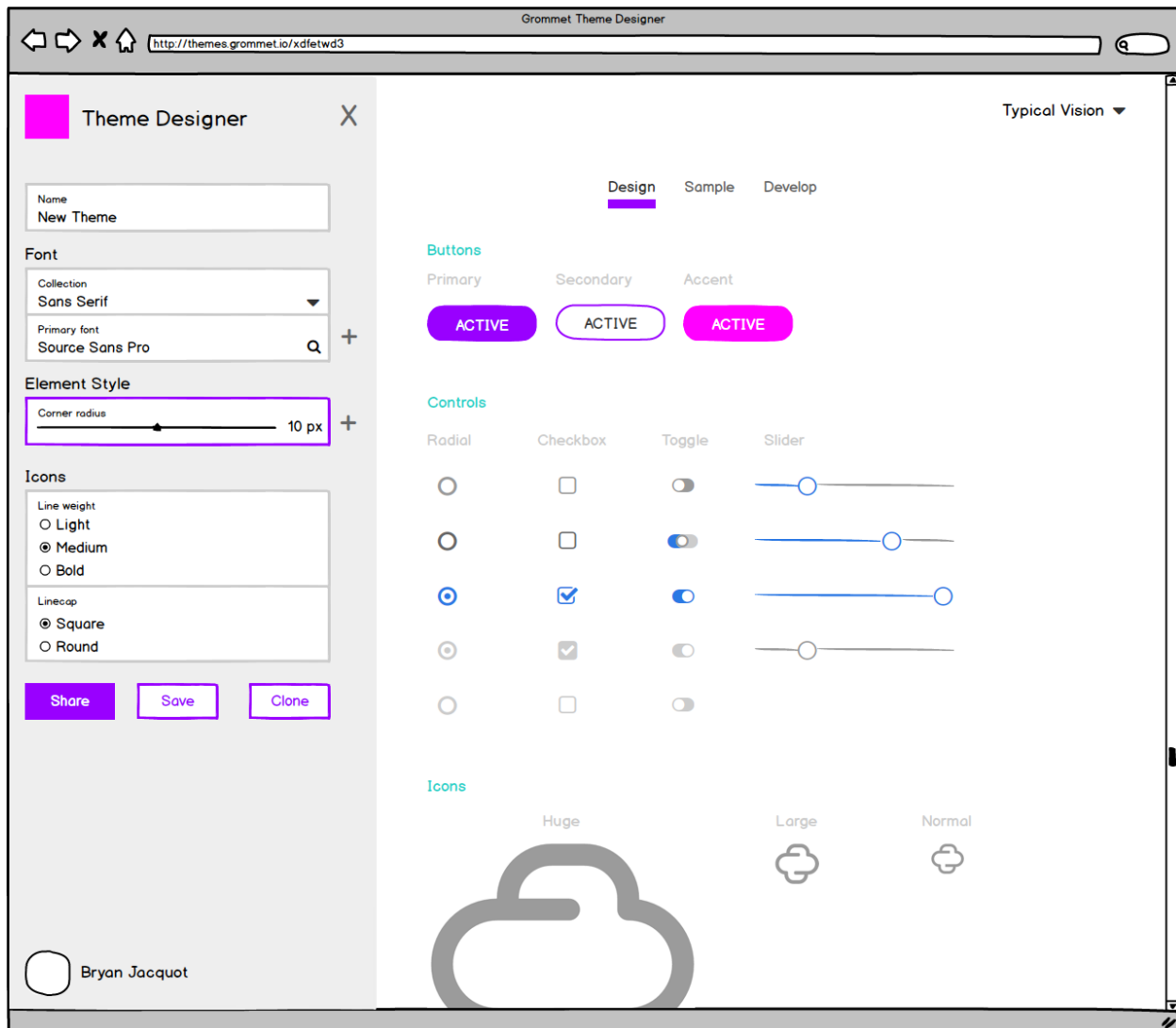

Figure 12. Button styling with corner radius of 10

The prototype in Figure 13 shows the ability for designers to customize the icon appearance. There are two control points available to designers. They can choose between light, medium, and bold line weight, and either square or round line caps. The combination of these choices provide six variations of icon shapes. For simplicity sake, only two of the combinations are in this document, but all six have been prototyped.

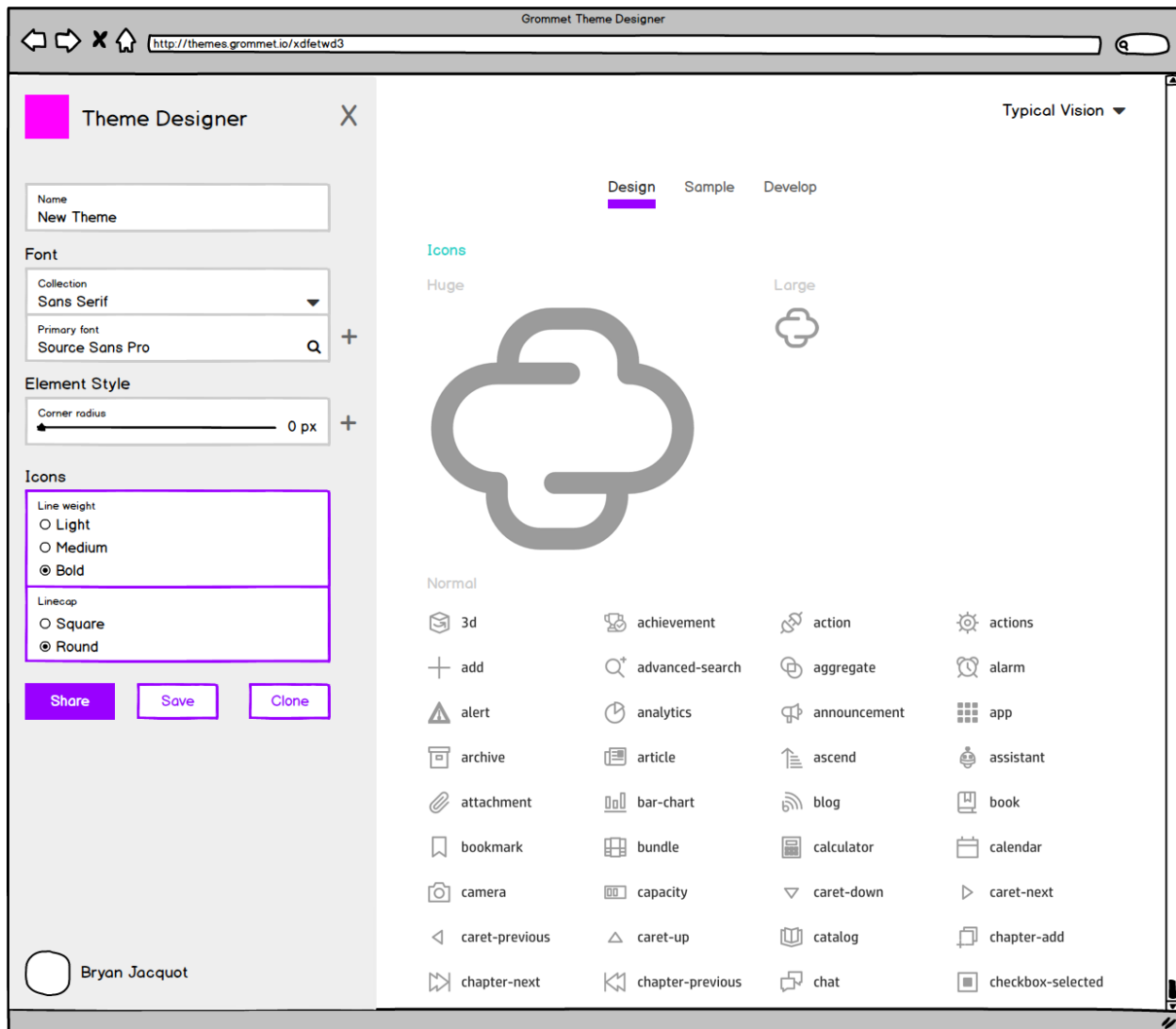The screen in Figure 13 shows the bold line weight with round line caps.

Figure 13. Icon styling showing bold lines with round ends

The screen in Figure 14 shows the icons with light line weight and square line caps.
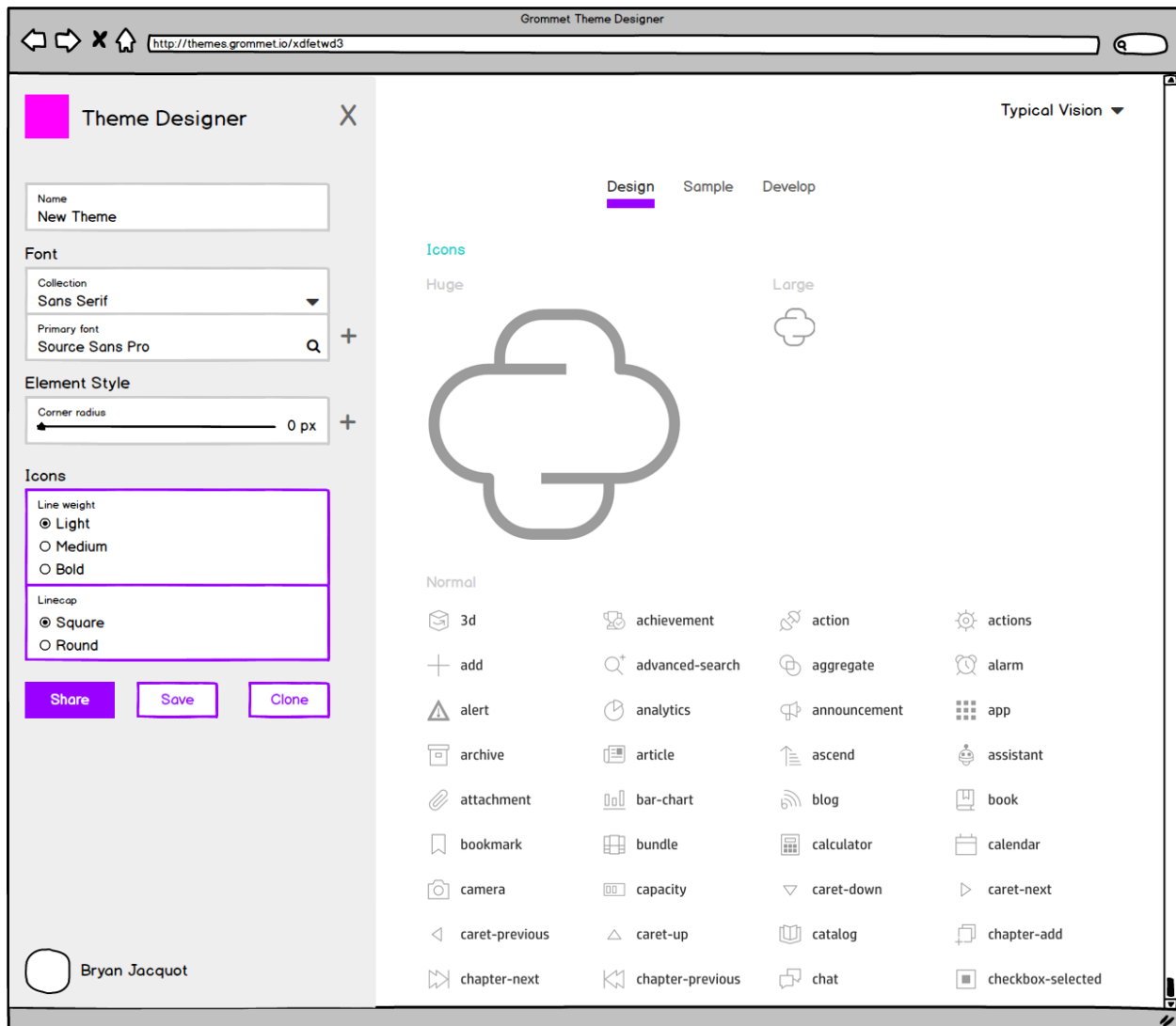

Figure 14. Icon styling with light line weight and square line ends

Once the designer is satisfied with their theme, they can save it using the Save button in the lower left of the screen, as shown in Figure 15. When invoked the user is prompted for the location in which to save the file. This file can then be imported in to Sketch, as the screens starting with Figure 19 illustrate.

The share and clone operations shown in this screen have not been prototyped. Sharing is best illustrated when the prototype is functional and has a backend capable of saving the theme and allowing other users to access it. The clone operation also most relevant when there is a backend service available to clone the theme. These features are left in the prototype for discussion purposes with usability testers.
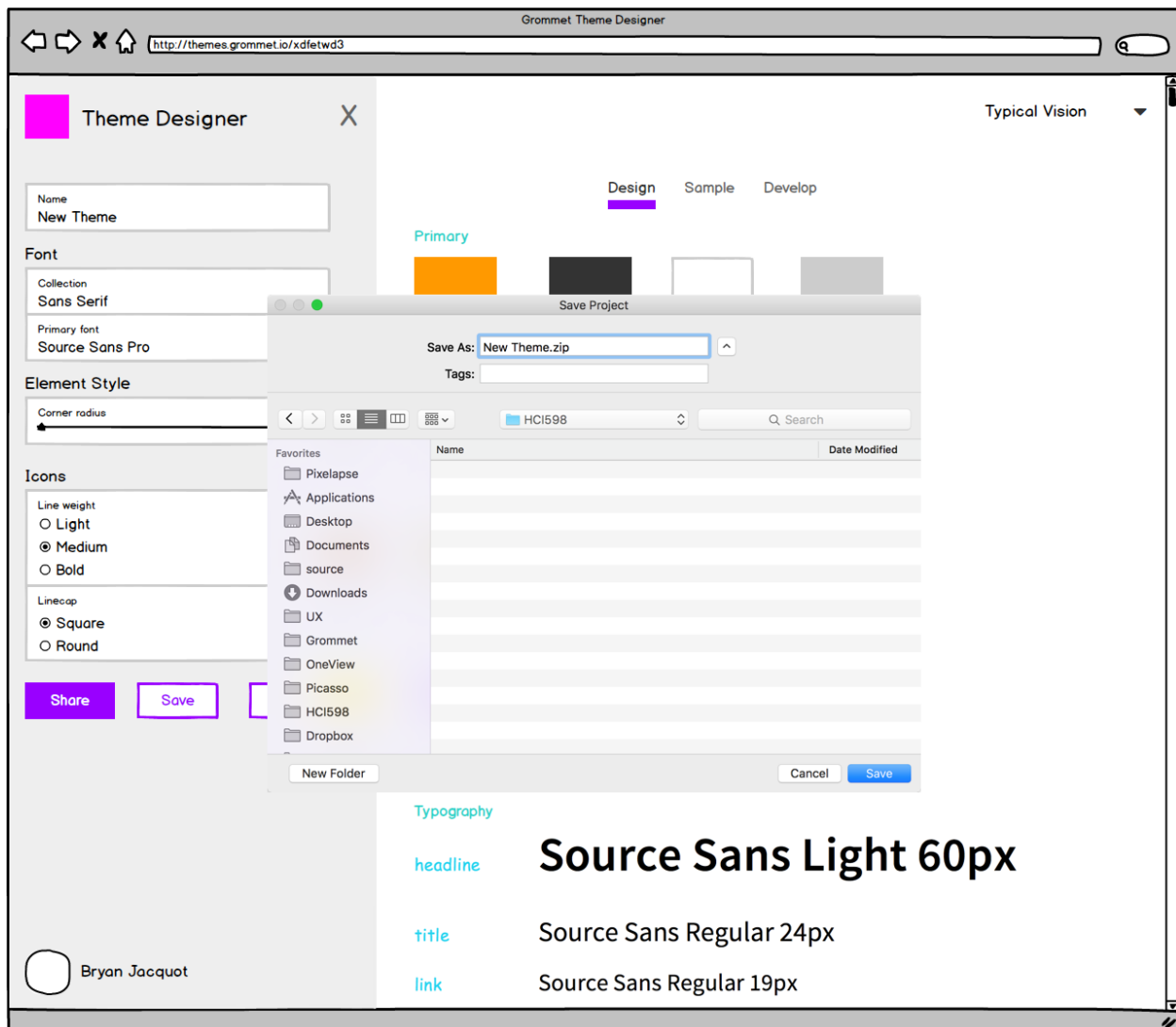

Figure 15. Save dialog allowing designers to save their work

Figure 16 is a sample application using the designer's theme. This allows the designer to see their selections in context of other components.   The prototype does not have an exhaustive sample application, but it should be adequate to demonstrate the intent to usability test subjects.
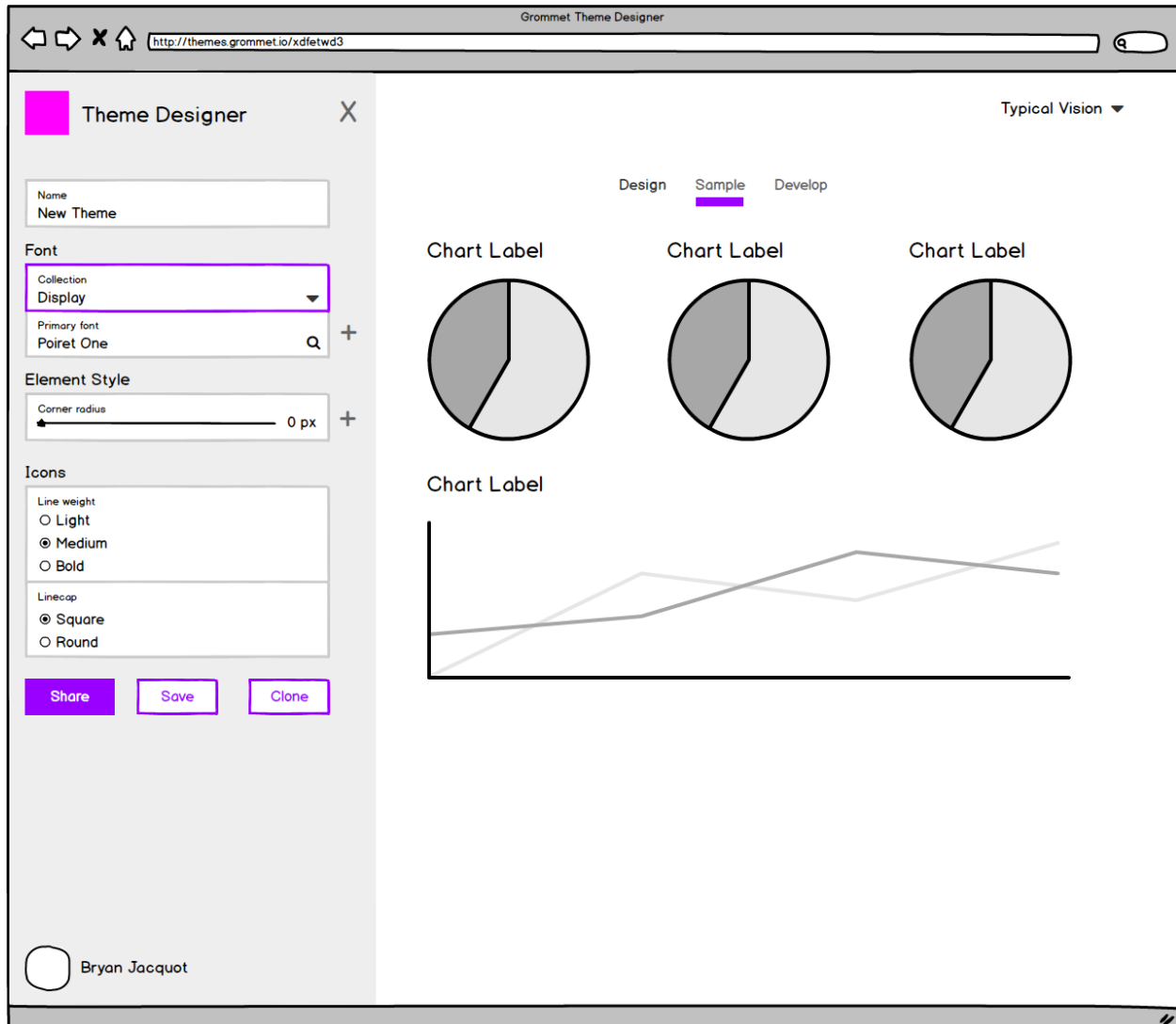

Figure 16. Sample application using the designer's theme

The prototype in Figure 17 shows the style sheet resulting from the designer's selections. This screen would primarily be used by developers to better understand the implications of the designer's selections.
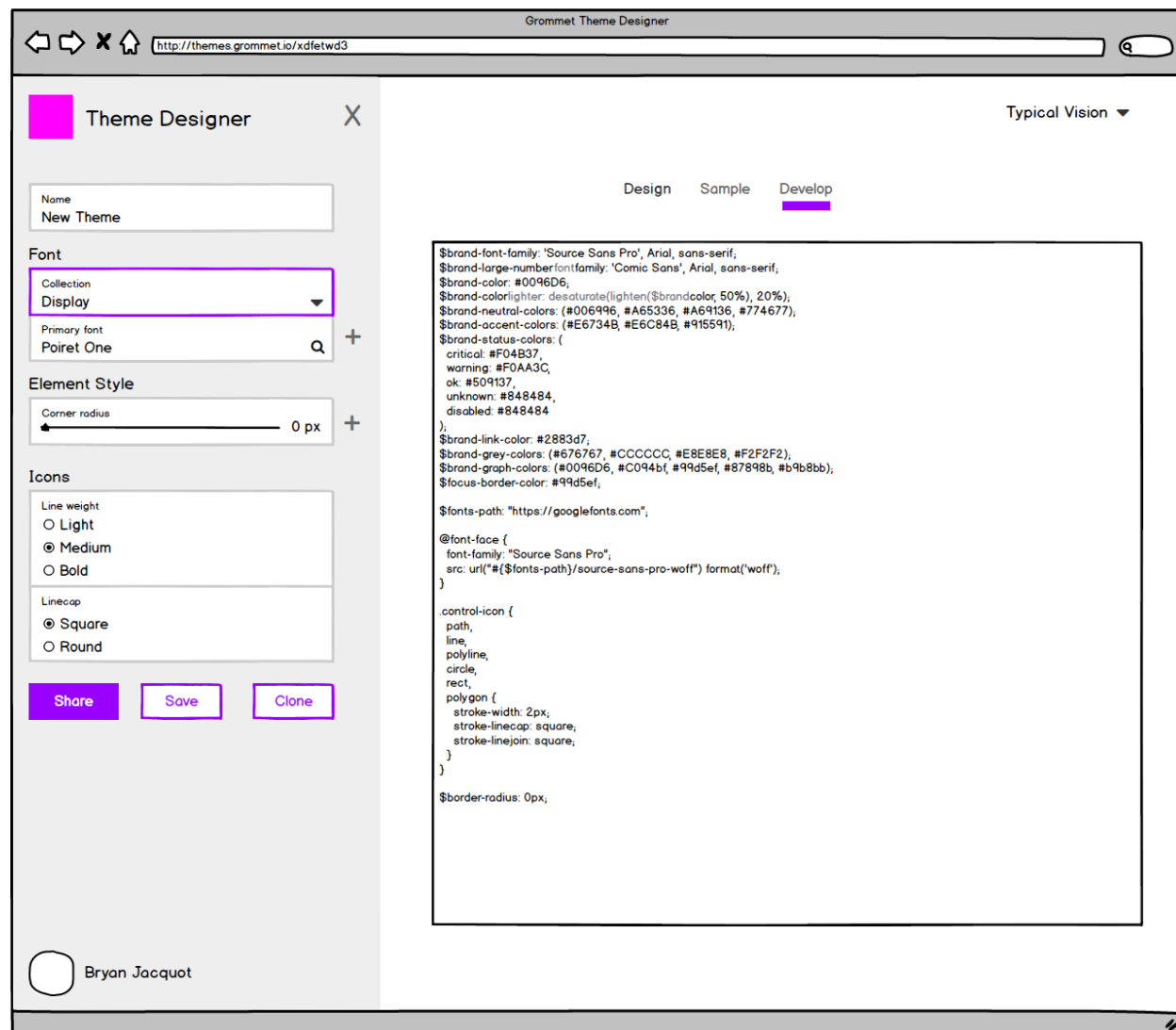

Figure 17. Developer's style sheet using the designer's theme settings

The screens in Figure 18 are notional mockups of the Grommet Theme Designer on a mobile platform. These have been prototyped only to the depth shown here. They will be explored during usability testing only to gauge the desire and frequency of use of a mobile platform for theme design. I expect most designers will create themes from their desktop, but may in fact use the mobile device for sharing the theme and gathering feedback.
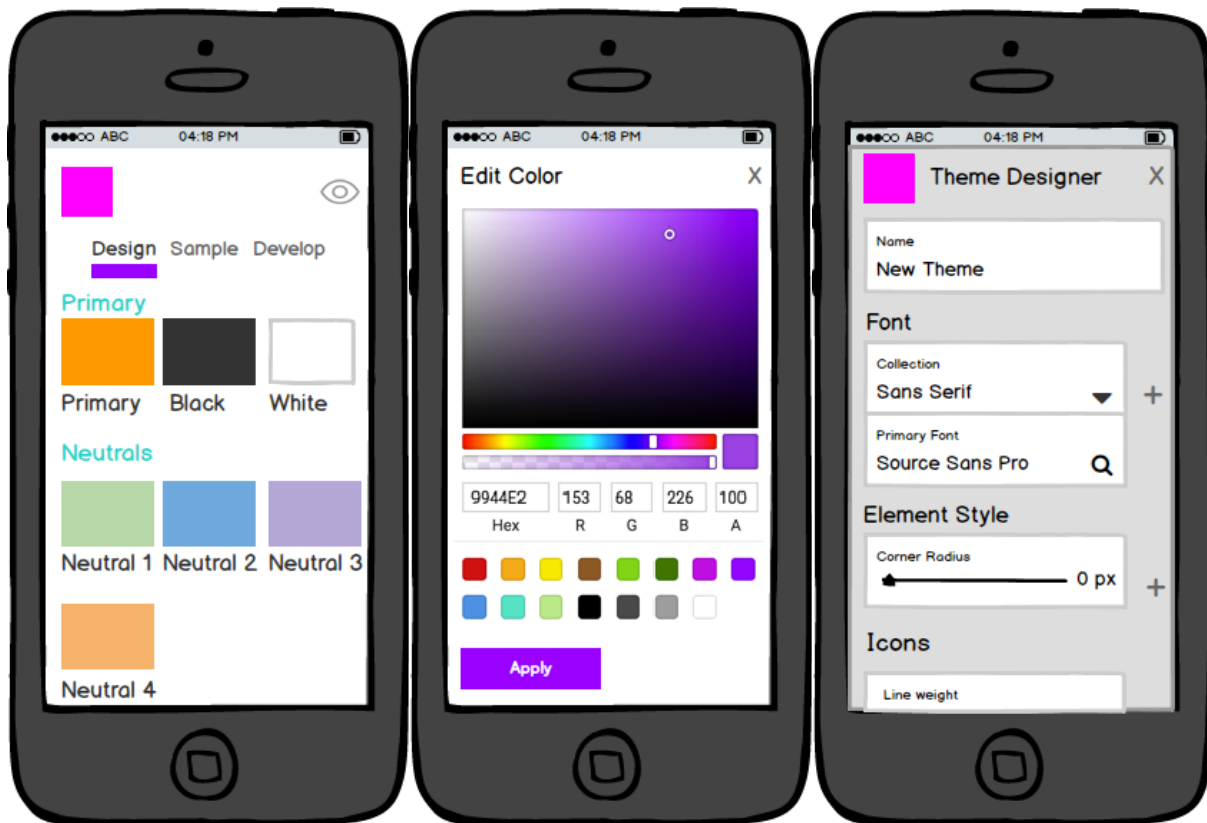

Figure 18. Conceptual mockups for Grommet Theme Designer on a mobile platform

The screen in Figure 19 shows the plugin menu with a new menu for the Grommet Theme Designer. The theme saved from the web interface will be imported into sketch using this capability to customize the sticker sheet based on the designer's theme. This allows designers to have immediate access to colors, buttons, tabs, fonts, etc according to their theme.
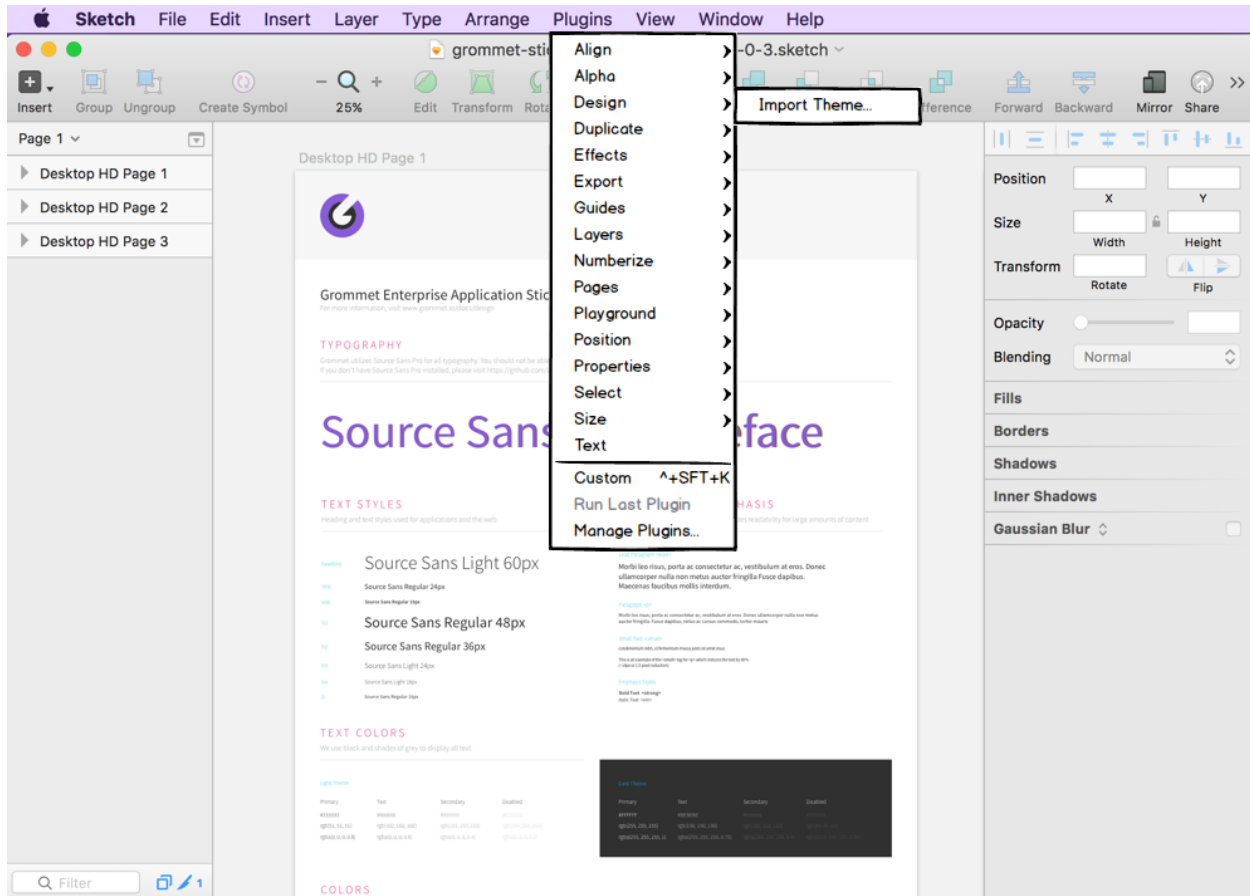

Figure 19. Sketch application with plugin menu open

When the plugin is invoked, the user navigates to the theme downloaded from the web interface as shown in Figure 20 and imports.
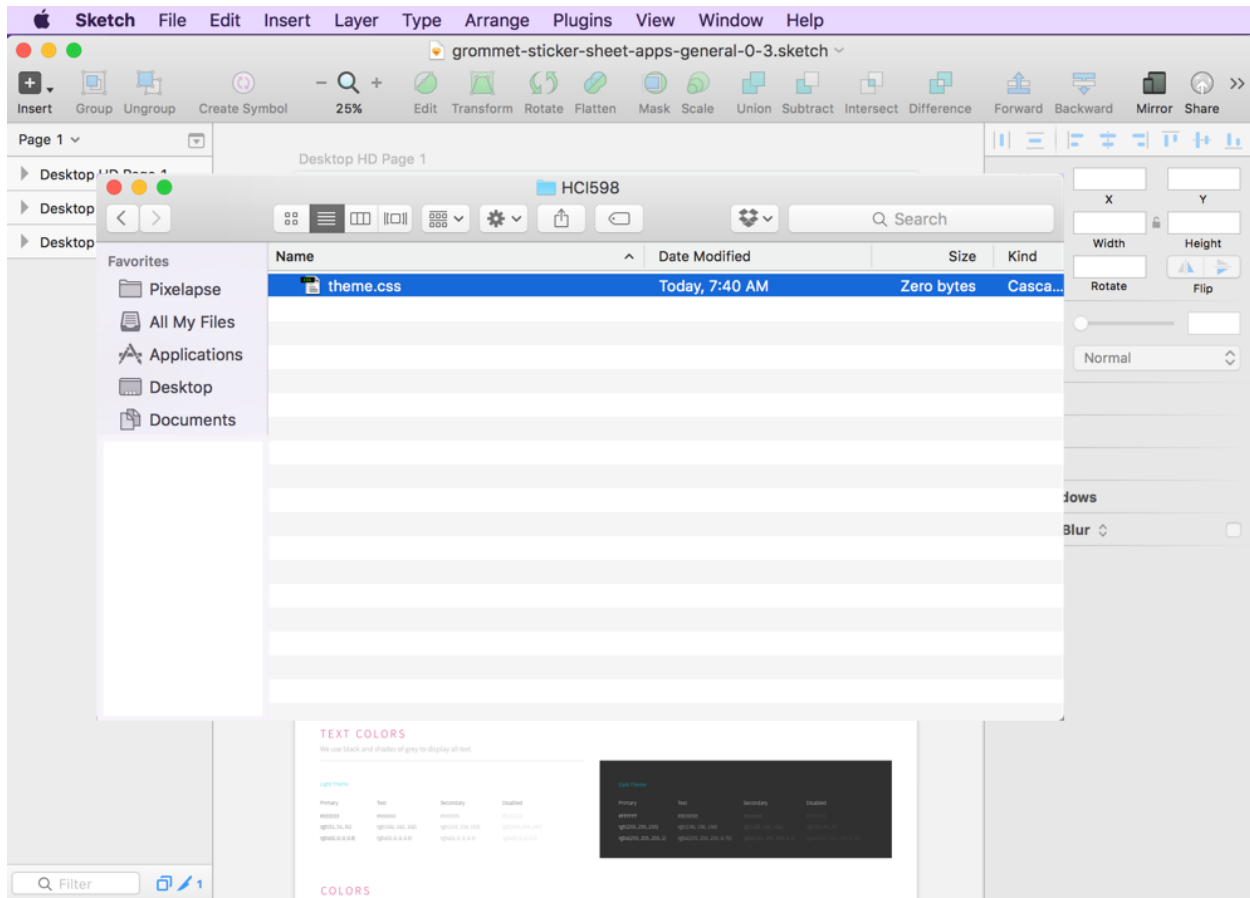

Figure 20. Opening of theme saved by the Grommet Theme Designer

Finally, once the import is complete, the sticker sheet shown in Figure 21 has the designer's theme imported from the Grommet Theme Designer.
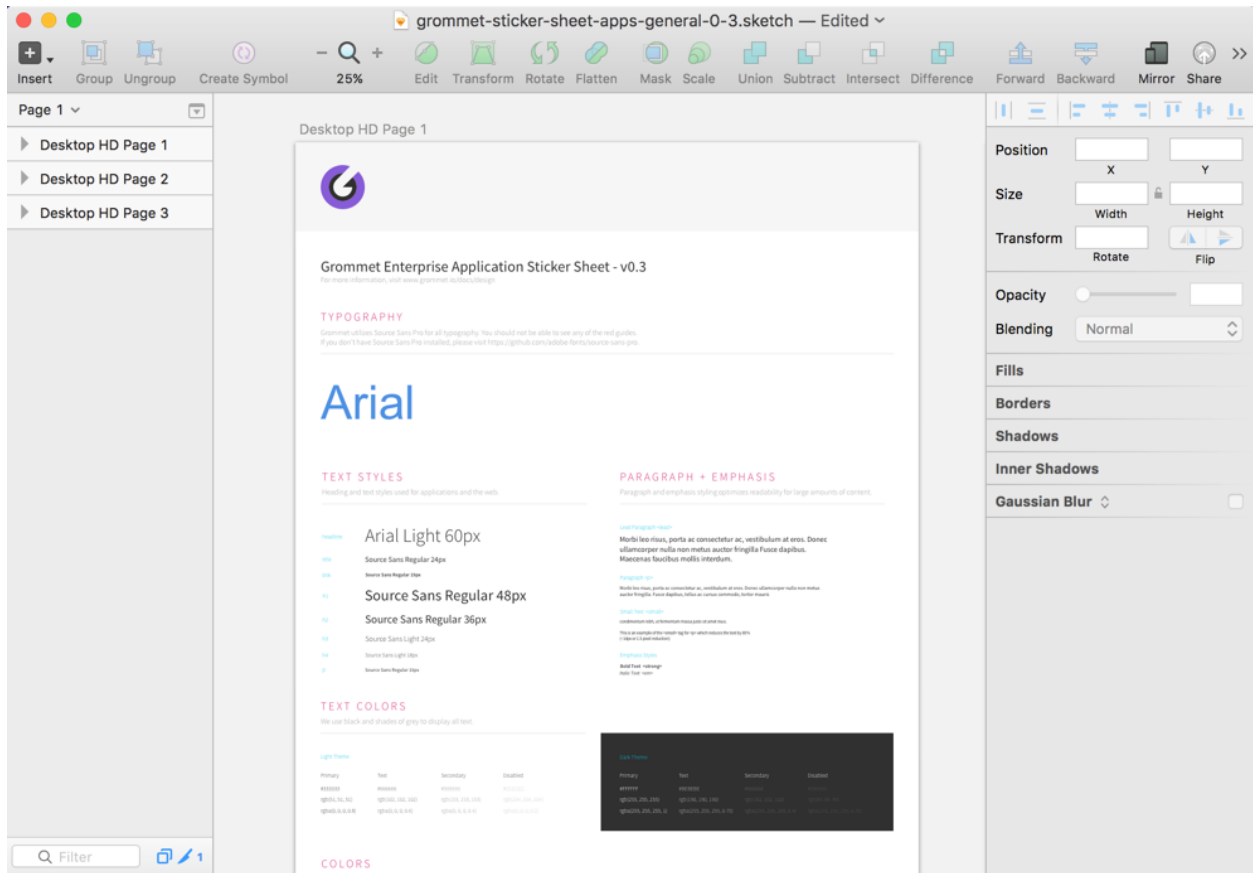

Figure 21. Updated sticker sheet baesd on designer's theme

Reflection

Prototyping the Grommet Theme Designer was a worthwhile exercise. It enlightened me to several design tradeoffs that I would have to consider. I was able to consider these tradeoffs without heavy investment into a functional system that I would have instinctively been resistant to change.

I am an advocate of iterative prototyping and starting the prototyping early in the design process. I never get the design right the first time, which is why I always try to iterate multiple times on prototypes. In fact, the prototype I created for M3 went beyond what was required for the M3 deliverable, but it helped me appreciate the subtleties of the design and make intentional tradeoffs.

Between the M3 and M4 prototypes, I made several changes to the design. First, I changed the background color of the left hand sidebar to lessen its salience. The purpose of this system is to allow designers create beautiful themes for their websites and web applications. As such, the design of the Grommet Theme Designer itself needed to be somewhat muted to avoid competing with the designer's work.

I also changed the form field highlighting technique. In the M3 deliverable, all of the form fields had a fully saturated purple color border which was aesthetically pleasing, but it would have demanded too much of the user's attention. As previously mentioned, I needed to soften the design of the Grommet Theme Designer to let the user's work shine. As a result, only the form field that is in focus has the fully saturated purple border. Other form fields that do not have focus are a soft, light gray.

Another change to the M4 prototype was the removal of the option to set a 3D depth for controls, such as buttons, tabs, and menus. I arrived at this position based on two factors. First, flat design is the modern trend, so encouraging designers to align with the current trends is appealing. Second, and more importantly, 3D depth can make it difficult for users to read. "Whilst excellent for presenting physical information and certain sorts of graphs, text presented in [3D] perspective can be very difficult to read" (Dix, 2004, p219).

Finally, in the M4 prototype I added two features that raise designer's awareness for creating themes that are accessible to all users, even those with disabilities. The first feature supporting this goal is automatic notifications when colors do not adhere to industry standard accessibility guidance from WCAG 2.0. The second feature raises awareness when colors lack adequate contrast to disambiguate them for users who have a form of colorblindness.

References

Bettin, Briana. (2016). *Bryan Jacquot's "Grommet Theme Designer": Peer Review.*

Dix, A. (2004). *Human-Computer Interaction*. Harlow, England: Pearson/Prentice-Hall.

National Eye Institute (Last reviewed 2015). *Facts About Color Blindness.* Retrieved from
        https://nei.nih.gov/health/color_blindness/facts_about

Norman, Don (2002-09-19). *The Design of Everyday Things* (Kindle Locations 1651-1652).
        Perseus Books Group. Kindle Edition.

Web Content Accessibility Guidelines (WCAG) 2.0. (2008). Retrieved from
        https://www.w3.org/TR/WCAG20/.

Walker, M., Takayama, L., & Landay, J. A. (2002, September). High-fidelity or low-fidelity, paper
        or computer? Choosing attributes when testing web prototypes. In *Proceedings of the
        Human Factors and Ergonomics Society Annual Meeting* (Vol. 46, No. 5, pp. 661-665).
        SAGE Publications.