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# The Moment: a mobile tool for people with depression or bipolar disorder

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**Abstract**

The Moment is a mobile application for people with depression or bipolar disorder to monitor their emotional ups and downs, reveal their emotional patterns, and eventually find a peaceful way to live with their emotions, rather than fighting with them. The system consists of two main components: a smart-

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phone application for the users to track their feelings and memories about events, and a sensor recording their physiological responses. The data will then be visualized in several ways and can be shared with trusted individuals or mental health professionals. The goal is to make the user more aware of her mood swings and the precursors to them; to reveal patterns of the swings; to provide a record for healthcare providers; to build a library of personalized interventions for future use; and to create an effective network of social supports.

**Author Keywords**

Emotion; Self assessment; Quantified self; Bipolar; Depression; Mobile Application; User Experience; User Interface; Data Visualization.

**ACM Classification Keywords**

Design

**Introduction and Related Work**

One of the authors first started this project with the attempt to help people like herself. Living with bipolar disorder for decades, she has tried various ways to cope with her emotions, including medication and counseling. She had never thought of the power she might have within herself until she was introduced to the idea of Positive Psychology. Positive Psychology is emerging as a new way to manage behavior by amplifying the positive aspects in life as opposed to

fixing the negative aspects [8]. This idea has inspired her to record the happy moments and use them to combat the bad ones. Using technology such as smart phones and wearable devices, she started to think about how these tools could change the way she dealt with her bipolar episodes.

Previous research about behavioral intervention technologies has been showing promising opportunities for psychological intervention strategies by using digital media to target behaviors, cognitions, and emotions in support of physical and mental health [7]. CalmMeNow [3] utilizes mobile devices for stress mitigation based on three types of interventions, including social networking. Self-reporting and logging systems showed more opportunities with wearable devices integrated into the design of interventions [1, 5, 6].

Reported clinical experience shows that a proper and positive intervention can be helpful for treating symptoms of bipolar disorder. From our user studies, however, we found an effective intervention should not be universal because everyone has unique experiences. A personalized intervention based on unique experiences will be of significant help. In addition to these personalized interventions, forming connections with trusted and/or close friends is another feature that helps the user when experiencing depression as social interactions play an important role in intervening mental health [3].

### **Methodology**

Since “The Moment” requires users’ long-term engagement to yield meaningful analysis, we believe that one of the best ways to engage users would be to make the tool intuitive and comfortable to use. Thus

the project has been designed and developed under an iterative process and long-term testing as we keep modifying the features to make it more intuitive. As the data analysis proceeds, we also have explored various data visualizations. Below is a simplification of the description of the steps in the process:

- Ethnographical research to explore potential needs and solutions.
- Contextual research on colors and emotions.
- Design and development of self-reporting interface and data visualizations.
- Interviews with medical professionals, therapist and clinical psychologists about factors that should be tracked to create meaningful visualizations that could reveal patterns.
- Consulting with writing professionals on deciding the most understandable language for the interface.
- User studies on descriptions of emotions and other factors, e.g. appetite and sleep quality.
- Usability tests on three versions of the interface with a total of 30 users with or without bipolar disorder and/or depression.

### **Interface**

A) Self-reporting. To create a self-reporting log of moods, the user first selects a color that best represents her feelings (Figure 2). In this screen, the color represents different emotions while the shades of the color represents the intensity of the emotions. The color scheme is based on previous research involving the expression of emotions and colors [2, 8, 9]. Once the user chooses a color, she will then be led to a screen with the chosen color as background and she can add notes including pictures, videos or voice

memos (Figure 3). The app also records time, weather and location data automatically. This information will be stored and used to create a library of personalized intervention for future use. In addition, the act to describe the activity can be helpful to better understand and deal with the emotions, according to the idea of Expressive Writing [4]. After finishing the note, the user will be led to the “Explore” screen (Figure 4) where the user can review all mood records shown as color bars. Each bar represents a log and a tap on the bar will reveal more information. There is also a filter button on the top right, allowing the user to see only one category of emotions. Since sleep quality and appetite are closely related to mood, which are very often asked by therapists, the app also allows the user to reports his/her sleep quality by indicating how well the user feels recharged (Figure 5) and to report his/her appetite by choosing the best description (Figure 6).

(Figure 6). By switching the timeline/overview toggle on the “Explore” screen, the user gets to see various overview charts that encourage them to discover patterns (Figure 7).

B) Social Supports. Support from family and/or close ones can be very powerful. Research has shown that the sense of being needed can be of great help to depression [10]. Thus, the “Friends” screen is not only for the user to get support from family/friends, but also to enable them to support their family/friends who are in need of support (Figure 8).

C) Personalized Interventions. The app monitors the user’s emotional fluctuations and reminds her of the happy moments she had (Figure 9).

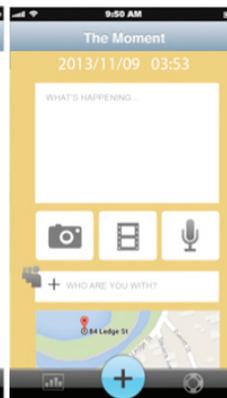
D) Connection with Therapists. The user can share the



**Figure 1.** The previous version of the color panel.



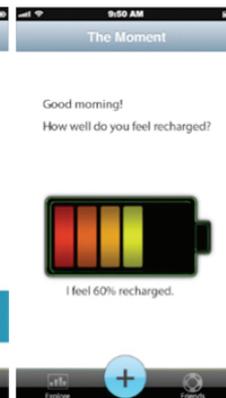
**Figure 2.** The color panel for mood logs.



**Figure 3.** The notes screen



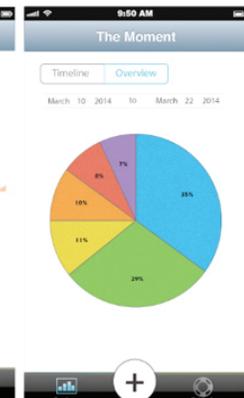
**Figure 4.** The Explore screen (timeline)



**Figure 5.** The appetite screen

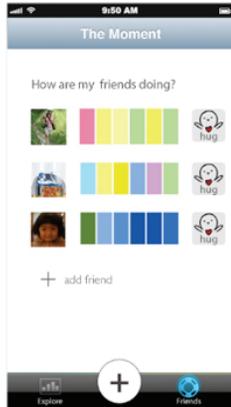


**Figure 6.** The sleep quality screen

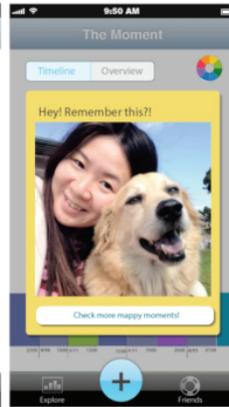


**Figure 7.** One of the overview screens.

data with her therapist to facilitate the counseling process (Figure 10).



**Figure 8.** The Friends screen.



**Figure 9.** A sample of personalized interventions.



**Figure 10.** The web-based therapist view

### Ongoing work

- Connect various wearable devices, such as Fitbit and physiological sensors, to the app for the user to compare her self-reporting data with behavioral and biological data and see if she can reveal some patterns.
- Bring other potentially helpful activities, such as meditation, food therapy, and behavioral change, to the design of interventions.
- Conduct a three-month user-testing phase to get data from a longer period of time and analyze the efficacy of the system.

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