The aim of the study was to test the feasibility of a mindfulness and self-compassion based program for adolescents, to be delivered through mobile phones. Twenty racially and ethnically diverse US adolescents enrolled in a study to use the app for 30 days, after which they provided satisfaction data and participated in focus groups to describe their experiences and offer suggestions for improving the app. Usage data were also captured. Results indicated that participants used the app on the majority of days over the intervention period, reported finding it helpful for managing stress, and provided suggestions for substantive areas for improvement. These findings suggest that a mobile app may be a feasible way to disseminate a mindfulness and self-compassion based program widely among adolescents.

Adolescence is a challenging period characterized by rapid cognitive, physiological, and neurological changes (Giedd, 2008) as well as increasing emotional and social demands. Interventions that foster coping and well-being are particularly important during this period.

Constructs drawn from Eastern contemplative traditions such as mindfulness and self-compassion are associated with well-being (MacBeth & Gumley, 2012; Keng, Smoski, & Robins, 2011; Zessin, Dickhauser, & Garbade, 2015) and may play a role in the pathway to emotional well-being in adolescents (Bluth & Blanton, 2013; 2014). Mindfulness focuses on awareness and attentiveness to immediate experience (Grossman, 2010), encouraging openness, curiosity and a compassionate acceptance of oneself. Interventions aiming to develop mindfulness skills in adolescents show a positive effect on a broad range of outcomes (Zoogman, Goldberg, Hoyt, & Miller, 2014) including decreased negative and increased positive affect (Broderick & Metz, 2009; Ciarrochi, Kashdan, Leeson, Heaven, & Jordan, 2011), as well as increases in well-being (Huppert & Johnson, 2010). Similarly, self-compassion emphasizes a compassionate way of relating to oneself through self-kindness, mindfulness and an appreciation of common humanity (Neff, 2003b) with an emphasis on self-soothing when encountering suffering (Germer, 2009). A controlled study of a mindful-self-compassion based intervention for adolescents resulted in greater self-compassion, greater life satisfaction, and significantly lower depression (Bluth, Gaylord, Campo, Mularkey, & Hobbs, 2016).
Mobile phone applications have a high potential for teaching these skills to a large number of adolescents. Almost three quarters of adolescents (73%) have or have access to a smartphone (Lenhart, 2015). Mobile interventions are effective at changing a range of health behaviors (Free et al., 2013). Thus, the aim of the current study was to test the feasibility of a novel approach to teaching mindfulness and self-compassion to adolescents through a mobile-based program.

1. Method

1.1. Recruitment and setting

Adolescents were recruited from an after-school organization providing employment in the arts to underserved youth. Inclusion criteria for the study were: (a) being enrolled at the organization; and (b) owning an iPhone or iTouch.

1.2. Intervention

Participants used the BodiMojo mobile app, with content based on Neff’s (2003a; 2003b) conceptualization of self-compassion which includes 3 constructs: mindfulness (non-judgmental awareness of ones’ thoughts and emotions); self-kindness (showing warmth and understanding towards oneself, especially in times of suffering), and common humanity (recognition that suffering and feelings of personal inadequacy are part of the shared human experience).

To facilitate engagement, the app features a customizable (color, facial features) partially animated “buddy” and consists of two daily activities: (1) tracking feelings and (2) reviewing/practicing a wellness tip. Tracking feelings involves selecting words that populate a “mood cloud,” providing a visual representation of the participant’s mood (PANAS; Watson, Clark, & Tellegen, 1988). The daily wellness tip prompts adolescents to engage in mindful acceptance, self-kindness and self-regulation and is sometimes linked to an audio relaxation. Daily wellness tips draw on self-compassion and mindfulness approaches and positive psychology (Bolier, Haverman, Westerhof, Riper, & Bohlmeijer, 2013; Kabat-Zinn, 2003, 1996; Neff, 2003a, 2003b). See Table 1.

1.3. Procedure

Participants provided signed parental consent and assent. Research staff met with the participants to download the app. During the 30-day intervention period, participants were instructed to open the app daily to: (1) record their feelings and review the personalized feedback; and (2) review a daily wellness tip. After the intervention period, participants completed a short satisfaction questionnaire prior to participating in a 30-min focus group. The goals of the focus groups were to: (1) explore adolescents’ experience with the app; and (2) elicit suggestions for improvements. Focus groups were audio-recorded and transcribed. Participants were compensated with a $50 gift card. The study was approved by the Northeastern University Institutional Review Board.

1.4. Measures

Participants provided age, race, ethnicity, and gender. Two outcomes were obtained: (1) usage data, (number of days that participants used the app); and (2) a nine-item satisfaction questionnaire assessing overall enjoyment, helpfulness, value of the program, and opinions about the design and preferences for features in the app.

1.5. Statistical analyses

Descriptive statistics were calculated for usage and satisfaction. Qualitative data were analyzed using a modified version of Braun and Clarke’s (2006) guidelines for thematic analysis. Specifically, two members of the team read the transcripts and

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Sample content messages.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-compassion construct</strong></td>
<td><strong>Sample messages</strong></td>
</tr>
<tr>
<td>Self-kindness</td>
<td>Life is impossible to get through without some embarrassment, [[username]]. When you feel shame, place your hand over your heart and (say ouch this hurts) and wish yourself well. Are you too hard on yourself? Me too. Tell yourself what you’d say to a good friend who needs support.</td>
</tr>
<tr>
<td>Common humanity</td>
<td>When something goes wrong, it’s easy to think you’re the only one going through it. You’re not alone. Others have felt the same way. Hang in there and stay hopeful! Ever find yourself saying, “FAILED,” when something doesn’t go your way? Laugh at yourself. It’s just part of being human!</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>Take a deep breath, [[username]]. Does breathing in feel cool or warm? What about breathing out? Can you feel the air moving in your body? Where? Look around and notice one beautiful thing. The light on a tree, the feel of the wind on your face, the color of the sky. Name what you see.</td>
</tr>
</tbody>
</table>
independently developed categories of responses to the two main questions (experience with the app and suggestions for improvements). Agreement on the proposed categories was reached through discussion.

### 2. Results

#### 2.1. Participants

Twenty participants were enrolled: 65% (n = 13) female, mean (SD) age = 16.9 (1.3); range 13–22 years. Seven participants identified as African American; three as Black Latino; two as Hispanic; two as Asian; one as Native American; one as Latino; and four as Caucasian. Four participants were unable to participate due to incompatible devices, thus 16 participants completed the 30-day study.

#### 2.2. Main outcomes

##### 2.2.1. Usage

Overall, participants used the app on the majority of the 30 days, mean (SD) = 16.8 (6.4), with a range of 6–26 days. During the 30 days, participants tracked their mood 13.8 (SD = 6.1) days, ranging from 6 to 26 days, and reviewed the daily wellness tip 14.4 (SD = 7.4) days, ranging from 3 to 25 days. Please see Table 2 for details about individual usage.

##### 2.2.2. Satisfaction

The majority (92.3%) rated the question “How much did you enjoy using the program?” a 6 or 7 (using a scale where 1 = not at all and 7 = very much). Ratings were also high for ease of navigation and understanding, with 72% and 86% of participants rating at 7 or above on a scale from 1 to 9 (1 = hated it, 9 = totally liked it). Regarding the design, 29% rated the design and graphics a 7 or above on the 1–9 scale, and 50% rated them above average. Participants’ ratings of specific features of the app are presented in Table 3. Seventy-one percent of participants found the program to help them to focus on their feelings, while 64% of participants reported that the program helped them to learn new relaxation skills. Regarding perceived value, 64% the participants indicated they would be very likely to continue to use the program if available and would recommend it to a friend.

##### 2.2.3. Focus group findings

The purpose of the focus groups was to gain an understanding of the participants’ experiences using the app and to gather suggestions for improvements. With respect to experiences, two major themes emerged. One, participants found the app to be soothing and relaxing, particularly the audio relaxations (e.g., “I was on the bus when I actually figured out the meditation thing … all of a sudden I heard voices. It was really cool, it was really soothing, relaxing and I actually listened to them and started paying attention to my surroundings and it was really nice.”). Two, participants reported that the app’s positive tone led them to feel happiness and/or gratitude (e.g., “Just by reading the boosts [daily wellness tips] I would say because that’s mostly what I did and paid attention to. They just really helped me. I had to think about deep things like my surroundings and the important people in my life.”).

Regarding potential improvements, three main themes emerged. One, participants wanted more specific content (e.g., “I wanted a more detailed description on how to get into the feeling. If I was happy I wanted to know if there were other ways to

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**Table 2**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Number of days feelings recorded</th>
<th>Mean number of times per day feelings recorded</th>
<th>Number of days wellness tip accessed</th>
<th>Total days with any activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>16</td>
<td>1.3</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>02</td>
<td>8</td>
<td>1.4</td>
<td>9</td>
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<td>03</td>
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<tr>
<td>16</td>
<td>17</td>
<td>1.2</td>
<td>8</td>
<td>19</td>
</tr>
</tbody>
</table>

**Mean** 13.8 1.3 14.1 16.8
make myself be more happy.”). Two, participants desired a more personalized experience (“I think it’d be nice if it got to know you personally like when you open the app it would call you by your name or maybe reflecting on emotions like it would ask you are you still tired from yesterday”). Finally, participants were interested in sharing their experience with others (e.g., “Be able to connect with Instagram or Twitter or Facebook so … if you want to screenshot your feeling or something like that you could automatically link it without having to take a picture of it and look through your camera.”). See supporting quotes in Table 4.

### 3. Discussion

This study tested the feasibility of a mobile app designed to increase mindfulness and self-compassion in adolescents. Our findings indicate that adolescents used the app on most days of the month and enjoyed the experience. Satisfaction and focus group data suggest that adolescents found the program easy to use and believe that they benefited from the suggested activities. In addition, the adolescents made useful suggestions for improving the app, including increasing personalization of features, expanding content, and sharing via social media.

This proof-of-concept study is limited by participant characteristics and sample size (n = 16) that impact generalizability beyond the study. In addition, while satisfaction was high, no outcome efficacy data were obtained. Furthermore, while the goal here was to assess whether adolescents would use the app, larger efficacy studies should assess daily usage in minutes per day. Nevertheless, our preliminary findings suggest that a mobile app would be a timely and feasible way to disseminate a mindfulness and self-compassion intervention among adolescents. Future research will aim to increase engagement with the app based on suggested improvements and evaluate the efficacy of the app in supporting positive well-being among adolescents.
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References