Supplemental Materials for

The Development of the Difficulties during Meditation involving Immeasurable Attitudes Scale

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Table S1

Initial items and evaluation by Buddhist experts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Expert 1 | Expert 2 | Expert 3 |
| 1 | I rarely feel a strong sense of kindness to the object of my practice.我很少感受到对练习对象的强烈善意。 | 4 | 3 | 4 |
| 2 | I lack a positive attitude toward the target in my practice.我在练习时缺乏对练习对象的积极态度。 | 4 | 3 | 3 |
| 3 | I am not aware of positive affects such as love and care toward the target in practice.我觉察不到对练习对象的爱或关心等正面情感。 | 4 | 3 | 4 |
| 4 | I can hardly arouse a sense of kindness toward the target in practice.我在练习时心中很难升起对练习对象的善意。 | 4 | 3 | 3 |
| 5 | I rarely experience interpersonal warmth.我很少体验到人际上的温暖。 | 4 | 3 | 3 |
| 6 | I am cold or indifferent toward my target in practice.我在练习中对练习对象态度冷漠。 | 4 | 4 | 4 |
| 7 | There is not much time when I feel positive affects toward my target in practice.我能感到对练习对象有正面情感的时候并不多。 | 4 | 3 | 3 |
| 8 | I do not generate much sincere feeling of goodwill toward the subject.我对练习对象并没有产生多少真挚的善意。 | 4 | 2 | 4 |
| 9 | The blessing is empty even though I try to give the subject my blessing.即便我试着祝福练习对象，这祝福也是苍白的。 | 4 | 2 | 3 |
| 10 | I feel a natural flow of benevolence from my heart for the target of practice.我感到对练习对象的善意从心中十分顺畅地流出。 | 4 | 4 | 4 |
| 11 | I can feel strong positive feelings towards the object of my practice.我能体验到强烈的对练习对象的积极情感。 | 4 | 3 | 4 |
| 12 | It is easy for me to arouse benevolence toward my target of practice.我在练习时很容易生起对练习对象的善意。 | 4 | 4 | 4 |
| 13 | My mind frequently wanders away.我走神的频率非常高。 | 4 | 4 | 4 |
| 14 | It is hard for me to focus attention on the practice I am supposed to do.我很难把注意力集中于该做的练习。 | 4 | 4 | 3 |
| 15 | I suddenly find myself mind-wandering for a long time.我突然发现自己已经走神了好久。 | 4 | 1 | 4 |
| 16 | I am constantly interfered by all kinds of irrelevant thoughts.各种无关的想法不断干扰我。 | 4 | 3 | 3 |
| 17 | My consciousness is always taken away by irrelevant contents.我的意识总被无关的内容带走。 | 4 | 2 | 3 |
| 18 | I really cannot keep my attention focused for long.我真的保持不了多久的注意力。 | 4 | 3 | 4 |
| 19 | I find it very difficult to focus attention on this practice.我觉得将注意力集中于这一练习很困难。 | 4 | 3 | 3 |
| 20 | My attention often goes all over the place.我的注意力常常到处乱跑。 | 4 | 3 | 4 |
| 21 | I feel hard to control my attention.我觉得难以控制自己的注意力。 | 4 | 4 | 3 |
| 22 | I can concentrate on the exercise.我的心能专注于练习。 | 4 | 4 | 4 |
| 23 | Most of the time I can focus on the practice I am supposed to do.我在多数时间能够专注于该做的练习。 | 4 | 4 | 4 |
| 24 | I think my attention is well-focused.我觉得自己的注意力比较集中。 | 4 | 4 | 4 |

Note: The Buddhist experts rated from 1 to 4 points, 1 = very improper, 2 = improper, 3 = proper, 4 = very proper. All Buddhists had learnt Buddhism for more than 10 years and one of them reported experience in teaching LKM, although more details were not available due to the long time. According to the feedback from Buddhist experts, item 9 and item 17 used description that was hard to understand (e.g., blessing is empty, consciousness is taken away). Item 15 was considered as confusable because it seems to reflect an awareness of distraction in time, especially considering that getting back from distraction reflect good skill in concentration. Item 8 was rated low simply because that “generate goodwill” sounds strange.

Table S2

Items, factor loading in first and final rounds of EFA

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | First Round | Final Round |
|  |  | Loading on F1 | Loading on F2 | Loading on Primary Component  | Loading on LOC | Loading on LOC | Item-Total Correlation |
| 1 | My mind frequently wanders away. | .638 | .185 | .642 |  |  |  |
| 2 | I am not aware of positive affects such as love and care toward the target in practice. | .212 | .430 | .466 |  |  |  |
| 3 | It is hard for me to focus attention on the practice I am supposed to do. | .759 | .197 | .731 |  |  |  |
| 4 | I lack a positive attitude toward the target in my practice. | .160 | .493 | .461 |  |  |  |
| 5(R) | Most of the time I can focus on the practice I am supposed to do.  | -.732 | -.311 | -.780 | -.763 | -.279 | -.760 |
| 6(R) | I feel a natural flow of benevolence from my heart for the target of practice.  | -.173 | -.597 | -.532 | -.147 | -.623 | -.575 |
| 7 | I am constantly interfered by all kinds of irrelevant thoughts. | .597 | .144 | .587 | .558 | .129 | .567 |
| 8 | I am cold or indifferent toward my target in practice. | .235 | .737 | .656 | .283 | .683 | .698 |
| 9 | I really cannot keep my attention focused for long. | .753 | .230 | .747 | .752 | .208 | .723 |
| 10 | I can hardly arouse a sense of kindness toward the target in practice. | .252 | .717 | .659 | .318 | .641 | .701 |
| 11(R) | I can concentrate on the exercise.  | -.729 | -.249 | -.741 | -.731 | -.268 | -.738 |
| 12(R) | I can feel strong positive feelings towards the object of my practice. | -.267 | -.692 | -.657 | -.245 | -.763 | -.710 |
| 13 | I find it very difficult to focus attention on this practice. | .671 | .379 | .777 |  |  |  |
| 14 | I rarely experience interpersonal warmth. | .071 | .428 | .348 |  |  |  |
| 15 | My attention often goes all over the place. | .663 | .158 | .642 |  |  |  |
| 16 | I rarely feel a strong sense of kindness to the object of my practice. | .161 | .314 | .351 |  |  |  |
| 17 | I feel hard to control my attention. | .775 | .197 | .741 | .758 | .187 | .714 |
| 18 | There is not much time when I feel positive affects toward my target in practice. | .171 | .635 | .553 | .166 | .609 | .584 |
| 19(R) | I think my attention is well-focused. | -.767 | -.315 | -.823 | -.862 | -.285 | -.815 |
| 20(R) | It is easy for me to arouse benevolence toward my target of practice. | -.159 | -.702 | -.579 | -.140 | -.754 | -.627 |

Note: Items with (R) indicated reversed items and this table presented factor loadings and item-total correlations in original ways without reversing scores of the reversed items.

Table S3

DMIAS used in current study

|  |  |
| --- | --- |
|  | Please indicate how following sentences can describe your experience in the practice you just did. 1 = Very untrue of me, 2 = Untrue of me, 3 = Somewhat untrue of me, 4 = Somewhat true of me, 5 = True of me, 6 = Very true of me |
| 1 | I am constantly interfered by all kinds of irrelevant thoughts. |
| 2 | I am cold or indifferent toward my target in practice. |
| 3 | Most of the time I can focus on the practice I am supposed to do. |
| 4 | I feel a natural flow of benevolence from my heart for the target of practice. |
| 5 | I can concentrate on the exercise. |
| 6 | I can feel strong positive feelings towards the object of my practice. |
| 7 | I really cannot keep my attention focused for long. |
| 8 | I can hardly arouse a sense of kindness toward the target in practice. |
| 9 | I feel hard to control my attention. |
| 10 | There is not much time when I feel positive affects toward my target in practice. |
| 11 | I think my attention is well-focused. |
| 12 | It is easy for me to arouse benevolence toward my target of practice. |

Note: LOC included odd items, and items 3, 5 and 11 were reversed items. LOP included even items and items 4, 6 and 12 were reversed items. Notably, current study presented items in present tense (rather than past tense) in all experiments due to negligence. Researchers could correct this to avoid confusion, and necessary validation is encouraged (see Discussion section for more discussion).



Figure S1. Confirmatory factor analysis of Study 2, LKM. PLOC1 = item 1 + item 11 (rescored), PLOC2 = item 3 (rescored) + item 9, PLOC3 = item 5 (rescored) + item 7, PLOP1= item 2 + item 12 (rescored), PLOP2 = item 4 (rescored) and item 10, PLOP3 = item 6 (rescored) and item 8.



Figure S2. Confirmatory factor analysis of Study 3, AJM. The measurement residuals across conditions were constrained.



Figure S3. Confirmatory factor analysis of Study 4, CM. The measurement residuals across conditions were constrained.

**Script for meditation practice**

 Following scripts were translated from Chinese. As noted in main document, the scripts were adopted from previous studies with permission.

**Loving-kindness meditation (Study 1 and Study 2)**

**Introduction on screen prior to meditation:**

 In the following, there will be a recording that guides a 6-minute imagination exercise. You need to visualize a best friend who shares a similar age and the same gender as you. You will imagine your friend is sitting in front of you, and give your blessing to your friend, such as “Wish you health and safety. Wish you joy and happiness.”

Please notice: (1) The exact wording or phrases of the blessing are not important. You may paraphrase the sentences in a way that fits you well. It will be crucial to make a sincere wish for your friend to bless your friend to be happy and joyful. (2) You may imagine your friend’s expression when he or she receives your blessing. However, do not imagine the outcome of staying happy in the future. You should emphasize the blessing, but not the outcome. (3) If you are distracted during the exercise, please do not feel worried and continue your imagination. (4) You do not need to bless aloud, only close your eyes and focus on your imagination.

**Script of the record:**

0:00 In the following, make yourself comfortable and close your eyes. Listen to the recording and start your imagination.

0:10 Now imagine your best friend is sitting in front of you. Your friend is peaceful at this moment. Now his or her expression is neutral and peaceful, peacefully sit on the chair, does not do anything. Try to imagine the way he or she is sitting in front of you. Visualize his expression is peaceful.

1:29 In your own words, give your best wishes to your friend, “Wish you health and safety. Wish you joy and happiness.”

2:17 Visualize your language and emotions as a stream or a light beam that flows from your heart to your best friend (this person), “Wish you health and safety. Wish you joy and happiness.”

2:54 Maintain your imagination. Let your sincere emotions flow freely with your heart, “Wish you health and safety. Wish you joy and happiness.”

3:29 “Wish you health and safety. Wish you joy and happiness.”

3:54 Think about your friend’ facial expression when she receives the blessing. Maintain your blessing, “Wish you health and safety. Wish you joy and happiness.”

4:29 “Wish you health and safety. Wish you joy and happiness.”

4:54 “Wish you health and safety. Wish you joy and happiness.”

5:19 Bless your friend with your words, a light beam, or a stream, “Wish you health and safety. Wish you joy and happiness.”

5:49 “Wish you health and safety. Wish you joy and happiness.”

6:14 “Wish you health and safety. Wish you joy and happiness.”

6:39 The imagination ends at this stage. Please open your eyes. The following instructions will be presented on the screen.

**Appreciative Joy Meditation (Study 3)**

 The Appreciative Joy Meditation for Friends and for Strangers were almost the same, and the only difference was the targets, which was illustrated in brace.

**Introduction on screen prior to meditation:**

 In the following, there will be a recording that guides a 6-minute imagination exercise. You need to visualize a best friend (a stranger) who shares a similar age and the same gender as you. You will imagine your friend (this stranger) is joyful and happy and then give your blessing to your friend (this stranger), such as “Wish you always get what you want. Wish you remain happy and joyful every day.”

 Please notice: (1) The exact wording or phrases of the blessing are not important. You may paraphrase the sentences in a way that fits you well. It will be crucial to make a sincere wish for your friend (this stranger) to bless your friend (this stranger) to be happy and joyful. (2) You may think of the reasons why your friend (this stranger) is feeling happy. However, the reasons for this happiness should not be emphasized. All you need to do is give your blessing, but not congratulate your friend (this stranger) on the happiness. (3) You may imagine your friend’s (this stranger’s) expression when he or she receives your blessing. However, do not imagine the outcome of staying happy in the future. You should emphasize the blessing, but not the reasons or the outcome. (4) If you are distracted during the exercise, please do not feel worried and continue your imagination. (5) You do not need to bless aloud, only close your eyes and focus on your imagination.

**Script of the record:**

0:00 In the following, make yourself comfortable and close your eyes. Listen to the recording and start your imagination.

0:10 Now imagine your best friend (a stranger) is sitting in front of you. Your friend (This person) is joyful at this moment. This joyfulness may be a result of a lovely surprise or being in luck, a significant achievement at study or work, or a happy life with his or her partner. Try to imagine the way he or she is sitting in front of you. Visualize the joyfulness and happiness that your best friend expresses.

1:29 In your own words, give your best wishes to your friend (this person), “Wish you always get what you want. Wish you remain happy and joyful every day.”

2:17 Visualize your language and emotions as a stream or a light beam that flows from your heart to your best friend (this person), “Wish you always get what you want. Wish you remain happy and joyful every day.”

2:54 Maintain your imagination. Let your sincere emotions flow freely with your heart, “Wish you always get what you want. Wish you remain happy and joyful every day.”

3:29 “Wish you always get what you want. Wish you remain happy and joyful every day.”

3:54 Think about your friend’s (this person’s) facial expression when she receives the blessing. Maintain your blessing, “Wish you always get what you want. Wish you remain happy and joyful every day.”

4:29 “Wish you always get what you want. Wish you remain happy and joyful every day.”

4:54 “Wish you always get what you want. Wish you remain happy and joyful every day.”

5:19 Bless your friend (this person) with your words, a light beam, or a stream, “Wish you always get what you want. Wish you remain happy and joyful every day.”

5:49 “Wish you always get what you want. Wish you remain happy and joyful every day.”

6:14 “Wish you always get what you want. Wish you remain happy and joyful every day.”

6:39 The imagination ends at this stage. Please open your eyes. The following instructions will be presented on the screen.

**Compassion Meditation (Study 4)**

 The longer compassion meditation simply added repeated guidance at the end of shorter compassion meditation, as illustrated below.

**Introduction on the screen prior to meditation:**

 In the following, there will be a recording that guides a 6-minute (15-minute) imagination exercise. You need to visualize a best friend who shares a similar age and the same gender as you. You will imagine your friend is in pain or sheer desperation and then give your blessing to your friend, such as “Wish you stay away from pain. Wish you become happy.”

 Please notice: (1) The exact wording or phrases of the blessing are not important. You may paraphrase the sentences in a way that fits you well. It will be crucial to make a sincere wish for your friend to bless your friend to be free of pain or sadness. (2) You may think of the reasons why your friend is feeling sad. However, the reasons for this sadness should not be emphasized. All you need to do is to give your blessing, but not convince or advise your friend. (3) You may imagine your friend’s expression when she receives your blessing. However, do not imagine the outcome of getting away from the sadness. You should emphasize the blessing, but not the reasons or the outcome. (4) If you are distracted during the exercise, please do not feel worried and continue your imagination. (5) You do not need to bless aloud, only close your eyes and focus on your imagination.

**Script of the record:**

0:00 In the following, make yourself comfortable and close your eyes. Listen to the recording and start your imagination.

0:10 Now imagine your best friend is sitting in front of you. Your friend is in great pain at this moment. This pain may be a result of illness or injury, suffering a major setback in the study or career, having a conflict with her partner or other unforeseen happenings. Try to imagine the way she is sitting in front of you. Visualize the sadness and pain that your best friend expresses.

1:29 In your own words, give your best wishes to your friend, “Wish you stay away from pain. Wish you become happy.”

2:17 Visualize your language and emotions as a stream or a light beam that flows from your heart to your best friend, “Wish you stay away from pain. Wish you become happy.”

2:54 Maintain your imagination. Let your sincere emotions flow freely with your heart, “Wish you stay away from pain. Wish you become happy.”

3:29 “Wish you stay away from pain. Wish you become happy.”

3:54 Think about your friend’s facial expression when she receives the blessing. Maintain your blessing, “Wish you stay away from pain. Wish you become happy.”

4:29 “Wish you stay away from pain. Wish you become happy.”

4:54 “Wish you stay away from pain. Wish you become happy.”

5:19 Bless your friend with your words, a light beam, or a stream, “Wish you stay away from pain. Wish you become happy.”

5:49 “Wish you stay away from pain. Wish you become happy.”

6:14 “Wish you stay away from pain. Wish you become happy.”

(shorter) 6:39 The imagination ends at this stage. Please open your eyes. The following instructions will be presented on the screen.

(longer) 6:39 Bless your friend with your words, a light beam, or a stream, “Wish you stay away from pain. Wish you become happy.”

(longer) 7:39 “Wish you stay away from pain. Wish you become happy.”

(longer) 8:39 “Wish you stay away from pain. Wish you become happy.”

(longer) 9:39 Bless your friend with your words, a light beam, or a stream, “Wish you stay away from pain. Wish you become happy.”

(longer) 11:09 “Wish you stay away from pain. Wish you become happy.”

(longer) 12:39 “Wish you stay away from pain. Wish you become happy.”

(longer) 14:09 “Wish you stay away from pain. Wish you become happy.”

(longer) 15:39 The imagination ends at this stage. Please open your eyes. The following instructions will be presented on the screen.