Reducing implicit cognitive biases through the performing arts

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\textbf{Keywords.} Implicit bias, Implicit Association Test, social cognition, malleability, attitudes, performing arts.
Abstract

The main purpose of the present research was to test whether involvement in a 14-day training program on the performing arts could reduce implicit biases. We asked healthy participants to complete an Implicit Association Test (IAT) to assess biased attitudes to physical illness in two separate sessions, before and after the training program. A separate control group matched by age, gender and educational level completed the two IAT sessions, separated by same number of days, without being involved in the training program. Results showed that participants who were involved in the training program reduced their implicit bias towards illness measured through IAT in the second session. This reduction in IAT measures was not observed in the control sample, despite the two IAT measures being matched in temporal delay with the experimental group. These findings suggest that an interventional program based on the performing arts could be effective in reducing levels of implicit biases among the general population.
Introduction

Implicit biases include attitudes that form through experiences and operate outside an individual’s awareness. Due to implicit cognitive biases, people may often attribute certain qualities or characteristics to all members of a particular group, a phenomenon known as stereotyping or prejudice. There has been much recent interest in studying the effects of implicit bias on behaviour, particularly when that may lead to discrimination in significant areas of life, such as healthcare, law enforcement, employment, criminal justice, and education (FitzGerald et al., 2019). Given this fact, society has an interest in finding ways to reduce levels of implicit biases among the general population and among professionals who work in these areas in particular.

To this date, the most broadly recognized measure of implicit biases is the Implicit Association Test (IAT; Greenwald et al., 1998). The IAT is usually administered as a computerized task where participants must categorize negatively and positively valenced words together with either images or words. For example, concepts such as “black” and “white” person could be associated with “good” and “bad”. Individual response latency is then calculated and used as a proxy for the strength of implicit associations between categories. The IAT has been researched extensively and found to be insensitive to procedural variation (Nosek et al., 2005) and less susceptible to faking than explicit measures such as questionnaires (Steffens, 2004). The IAT has also demonstrated solid internal consistency, and high test-retest reliability (Greenwald, Nosek, 2001; Greenwald, Farnham, 2000; Dasgupta et al., 2000; Bosson et al., 2000).

Originally, implicit measures were assumed to be inflexible and resistant to change (Fazio et al., 1995). This dominant view has changed over the past 15 years to one of implicit malleability, with many studies findings that implicit associations are sensitive to lab-based interventions (for reviews, see Blair, 2002; Gawronski & Bodenhausen, 2006; Lai et al., 2013). In fact, a recent study that evaluated several interventional techniques found that those that were more self-relevant, emotional, and vivid tended to be more effective than those
which were less involving (Lai et al., 2014). These findings are in line with studies that demonstrated that whenever a message can be related to the message recipient’s “self”, it becomes more personally relevant and more likely to be processed (e.g., Blankenship & Wegener, 2008; Petty & Cacioppo, 1990).

Motivated by the need to find ways to reduce levels of implicit biases among the general population, we here aimed to investigate whether the involvement of non-professional artists in a training programme on the performing arts influenced implicit measures. Acting requires an actor to understand a character’s mental world and the experience of that character’s feelings. The ability to adopt the perspective of another person has been identified as a critical component of social functioning that predicts the level of empathic concern for other individuals (Davis, 1983) and the level of category-based responding toward out-groups (Galinsky & Moskowitz, 2000). In taking another person’s perspective, one comes to treat that person as more “self-like”. Indeed, the extent to which perceivers describe another person as sharing their own personality attributes increases after they imagine an event from that person’s perspective (Davis et al., 1996).

Here, we asked non-professional artists to enrol in a training program of 14 consecutive full days, whereby they were requested to devise, prepare and implement a real show that expressed the notion of “cancer and neurodegenerative diseases”. To achieve this, artists were immersed into a preparation stage that involved meeting groups of scientists that researched different aspects of the illness, from molecular biology to patient care. During the 14-day program, artists were exposed to information that allowed them to better understand the illness from a biological point of view, as well as to help them invoke realistic behaviour from a patients’ perspective, thereby fostering self-relevancy, emotionality, and vividness in their training program. We hypothesized that this particular interventional approach would influence implicit cognitive bias to illness, a stigma that is extended among the general population and clinical practitioners (Brohan et al., 2010; Link et al., 2004). To quantify the degree to which the training program influenced implicit cognitive bias on an “illness”, artists (i.e., the experimental group) were requested to complete an
IAT before and after the training program that included images of sick/healthy people and words related to good/bad attributes. A matched control group of healthy participants completed the IAT sessions separated by the same interval of days and this data was used to assess for the specificity of possible changes between the two IAT sessions in the experimental group.

**Methods**

*Participants*

A group of thirty-two non-professional volunteers were invited to participate in the 2-session experiment separated in different days. Nineteen individuals accepted the invitation to participate but only sixteen (7 female) participants completed the two experimental sessions and data from them was the one included in the analysis. Participants’ average age was 31.62 years old (SD = 6.09). The control group included sixteen individuals matched one-by-one with the experimental group on age and gender. Thus, the control group comprised sixteen participants (7 female) with an average age of 31.62 years old (SD = 6.09) too. Participants from the two groups had similar educational levels (experimental group: M = 11.75 years, SD = 1; control group: M = 12, SD = 1.46; t(30) = -0.56, p = 0.58, Cohen’s d = 0.19). Participants in the experimental and control group reported no history of psychiatric or neurological disease and were free of any psychoactive medication during the study.

*The performing theatre interventional program*

The experimental group enrolled in an interventional program lasting 14 consecutive full days, developed by la Fundació Èpica – La Fura dels Baus (https://epicalab.com) which, through the performing arts, is capable of effectively promoting self-engagement, vividness and emotion. The creative process applied in the program is based on the methodology and language developed by La Fura dels Baus over 40 years.
The process consists of dynamic theatre activities which include scientific training. On the first day, different scientists explain the scientific concepts, research questions and approaches behind cancer and neurodegenerative disorders. The remaining 13 days are divided into three phases: the cohesion and the creation phases, and the show.

The cohesion phase takes place during the first 5 days with the objective of generating a homogeneous and united group. During this phase, participants are immersed in a series of physical and theatrical exercises specially designed to tackle disinhibition, team building, cooperation and emotional arousal. This part of the process aims to maximize synergies among the candidates. By the end of the cohesion phase, Épica introduces a narrative concept (i.e., cancer and neurodegenerative diseases) to work on during the next phase, and on which the final performance will be based.

The creation phase follows the cohesion phase and takes 7 days. During the creation phase, participants are required to transform a narrative concept into a performing arts performance. During this phase, participants design and implement the specific set-up that will guide the final show. The process is highly creative and engaging, thereby bringing participants into a fully immersive environment with high doses of arousal. The creation phase has several stages: identification of skills/interests, transformation of ideas into actions, run-throughs, identification of technical needs and rehearsals.

On the fourteenth day, the experimental group performs the show in front of a general audience of ~100 people (e.g., https://www.youtube.com/watch?v=LtalG87Epsg).

Materials

The IAT experiment included sixteen words in Spanish and eight images. Words representing “Good” attributes were “Beautiful, Precious, Contented, Enthusiasm, Excellent, Glorious, Pleasure, Happy” and words representing “Bad” attributes were “Horrible, Frightful, Hate, Grief, Selfishness, Poison,”
Disgust, Dirty”. Images were selected from web searches to depict four different people dressed up as patients from a hospital (“Sick” category) and four people dressed up as sporty individuals (“Healthy” category). Each picture category set included two female and two male individuals and, although the two sets of images were intended to reflect distinct contextual circumstances of people, both sets depicted people that expressed pleasant and smiley faces.

Procedure
The IAT consisted of 7 blocks (Table 1). Three blocks (1, 2 and 5 in Table 1) were pure practice blocks in which either target stimuli (Blocks 1 and 5) or attribute stimuli (Block 2) were sorted in their reference categories. The remaining blocks were the associative blocks that constitute the two mapping conditions of the IAT (e.g., mapping healthy-good and mapping sick-bad). During Block 1, participants were trained on how to differentiate between the sick and healthy images. Each image was presented 3 times in random order, resulting in 24 trials. Subsequently, in Block 2, subjects had to use the same response keys for classification of the 8 good words and the 8 bad words, which were presented 3 times, resulting in 48 trials. During Practice Block 3, the 2 former tasks were combined. Half of the subjects started the combined task by pressing the same key for healthy images and good words. The other half started this block by pressing the same key for healthy images and bad words. Each word was presented twice (2 x 16 = 32 trials), and each image was presented 4 times (4 x 4 = 32 trials), resulting in 64 trials. Words and images were presented randomly throughout the block. Block 4 was the same as Block 3 though the order of the trials was randomized. During Block 5, the target categories changed positions on the computer screen, resulting in a required switched response for the target images. Again, the 4 healthy and the 4 sick images were presented three times (24 trials). No exemplar words from the good and bad categories were presented during this block. Practice Block 6 was a new combined task due to the target dimension switch. Each word was presented twice (2 x 16 = 32 trials), and each image was presented 4 times (4 x 4 = 32 trials), resulting in 64 trials. Block 7 was the same as Block 6 though the order of the trials was randomized.
Table 1. Block sequence in the Implicit Association Test (IAT). Note: Blocks 3-4 and 6-7 associative order and key response assignment were counterbalanced between participants.

<table>
<thead>
<tr>
<th>Block</th>
<th># of trials</th>
<th>Function</th>
<th>Left-key response</th>
<th>Right-key response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>practice</td>
<td>Healthy</td>
<td>Sick</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>practice</td>
<td>Bad</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>64</td>
<td>associative</td>
<td>Healthy-Bad</td>
<td>Sick-Good</td>
</tr>
<tr>
<td>4</td>
<td>64</td>
<td>associative</td>
<td>Healthy-Bad</td>
<td>Sick-Good</td>
</tr>
<tr>
<td>5</td>
<td>24</td>
<td>practice</td>
<td>Sick</td>
<td>Healthy</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>associative</td>
<td>Sick-Bad</td>
<td>Healthy-Good</td>
</tr>
<tr>
<td>7</td>
<td>64</td>
<td>associative</td>
<td>Sick-Bad</td>
<td>Healthy-Good</td>
</tr>
</tbody>
</table>

Participants were instructed to categorize as quickly and accurately as possible the words and images into the 4 categories (healthy, sick, good, bad) by pressing the corresponding response keys on a computer keyboard. The words/images that had to be classified appeared one by one in the centre of the screen. During each IAT block, the category concepts remained visible in the left and right upper corners of the screen. Word categories were presented in blue and image categories in green. Participants had to respond by pressing the “e” (index finger left hand) for words/images that belonged to a category in the left corner and the “i” (index finger right hand) for words/images that belonged to a category in the right corner. In case of a wrong answer, a red cross appeared. Participants had to correct the mistake by quickly pressing the alternate key. As soon as the correct key was pressed, the next word/image appeared. Response latency (i.e., reaction time) was calculated from the beginning of the trial until the time of a correct response, and latencies less than 400 ms were removed.

**Results**

To assess for the existence of changes in social biases specifically in the experimental group between IAT sessions, a mixed ANOVA was performed on mean reaction time (RT) to the associative blocks (Figure 1). The ANOVA included RT (2 levels: congruent vs incongruent) and session (2 levels: pre and post) as within subject factors and group (2 levels: experimental and control) as between subject factor. This analysis revealed a statistically significant main
effect of session ($F(1,30) = 8.91, p = 0.006, \eta^2 = 0.23$) and RT ($F(1,30) = 33.23, p < 0.001, \eta^2 = 0.53$), corroborating that participants were slower in categorizing words/images when social biased categories shared the location on the screen (i.e., sick/good and healthy/bad). Importantly, we found a triple RT, session and group effect ($F(1,30) = 5.94, p = 0.39, \eta^2 = 0.02$) but not a session x group ($F(1,30) = 0.76, p = 0.39, \eta^2 = 0.02$) nor RT x group interaction effect ($F(1,30) = 0.01, p = 0.93, \eta^2 < 0.01$), indicating that the RT effects between conditions and sessions varied differently as a function of the study group. To identify the source of this effect, we ran a repeated measures ANOVA including RT and session as within subject factors separately for each group. This analysis confirmed that the two groups showed a significant main effect of RT to experimental ($F(1,15) = 16.92, p = 0.001, \eta^2 = 0.53$) and control ($F(1,15) = 16.26, p = 0.001, \eta^2 = 0.52$) group, but a significant main effect to session and session x RT interaction effect to the experimental (session: $F(1,15) = 5.54, p = 0.03, \eta^2 = 0.27$; session x RT: $F(1,15) = 10.32, p = 0.006, \eta^2 = 0.41$) but not to the control group (session: $F(1,15) = 3.39, p = 0.08, \eta^2 = 0.18$; session x RT: $F(1,15) = 0.31, p = 0.58, \eta^2 = 0.02$). A student paired t-test analysis revealed significant differences in RTs to incongruent ($t(15) = 3.01, p = 0.009, \text{Cohen's } d = 0.75$) but not to congruent ($t(15) = 0.23, p = 0.82, \text{Cohen's } d = 0.06$) trials between session in the experimental group but not in the control group (RTs to incongruent trials: $t(15) = 0.81, p = 0.43, \text{Cohen's } d = 0.20$; RTs to congruent trials: $t(15) = 1.47, p = 0.16, \text{Cohen's } d = 0.37$).
Figure 1. Latency results for each study group and condition. RT measures were extracted by averaging RTs to associative blocks in the IAT design. "incong." refers to blocks 3 and 4 and "cong." refers to blocks 6 and 7. RTs to each individual and condition are depicted in grey circles. For all boxplots, the central mark is the median, the edges of the box are the 25th and 75th percentiles.

To further assess for the specificity of the RTs effects found in the critical experimental condition, we ran a mixed ANOVA mean reaction time (RT) to the practice blocks. The ANOVA included RT (2 levels: 1st vs. 2nd presentation block) and session (2 levels: pre and post) as within subject factors and group (2 levels: experimental and control) as between subject factors. This analysis revealed a significant main effect of RT (F(1,30) = 7.1, p = 0.012, \( \eta^2 = 0.19 \)) and session (F(1,30) = 7.81, p = 0.009, \( \eta^2 = 0.21 \)), but no interaction with group (all ps >0.2, all \( \eta^2 < 0.1 \)).

Finally, we calculated the IAT D-score, which instead of comparing within-participant differences in RTs, standardizes them at the participant level, dividing the within-participant difference by a “pooled” standard deviation (Greenwald et al., 2003). D-scores in the experimental group were M = 0.61 (SD = 0.49) and M = 0.34 (SD = 0.54) in the pre and post observation, respectively, and M = 0.41 (SD = 0.56) and M = 0.55 (SD = 0.44) in the pre and post measures in the control group. A mixed ANOVA, including session (2 levels: pre and post) as a within-subject factor and group (experimental vs
control) as a between-subject factor, confirmed previous findings by revealing a statistically significant session x group interaction ($F(1,30) = 5.79, p = 0.02, \eta^2 = 0.16$). A paired student t-test showed statistically significant D-score difference between pre and post in the experimental group ($t(15) = 2.55, p = 0.02, \text{Cohen's } d = 0.64$) but not in the control group ($t(15) = -1.04, p = 0.32, \text{Cohen's } d = -0.26$).

**Discussion**

The main purpose of the present research was to test whether involvement in a performing arts training program of 14 full days could influence the shift of implicit measures. To this end, we conducted an experiment in which healthy participants completed an IAT to assess biased attitude to illness in two separate sessions, before and after the training program. A similar two-session IAT task was completed by a matched control group of healthy participants. Results showed that participants who were involved in the training program reduced their implicit bias towards illness measured through IAT in the second session. This reduction in IAT measures was not observed in the control sample, despite the two IAT measures being matched in temporal delay with the experimental group. These findings suggest that an interventional program based on the performing arts could be effective in reducing levels of implicit biases among the general population.

To the best of our knowledge, this is the first study showing that a training program based on acting can have an influence on implicit cognitive bias, thereby raising the possibility of extending previously established lab-based interventional techniques that can reduce implicit bias (e.g., Lai et al., 2014 and 2016) to include more realistic approaches. Current findings therefore may represent a first attempt to show the promising possibilities that the performing arts may have to help treat prejudice and stereotypes. At the same time, the present study lacks a clear explanation of the mechanisms that underlie this effectiveness, as it was not designed with such purpose. Nevertheless, we can offer some speculations. Previous research revealed that
most effective lab-based techniques to reduced implicit bias invoke self-relevancy, emotion and vividness (Lai et al., 2014). While designing strategies that can effectively elicit these properties in individuals may be challenging in the laboratory, inducing them by requesting people to perform as actors seems more practicable. Thus, one possible explanation for the results of the present study is that the self-involvement induced in the participants a more thorough processing of the scenario which, in turn, determined a shift in IAT effects.

Several important questions, however, remained unanswered in the current study. The first one concerns the specificity of the effects. More concretely, it would be important to determine in the future the extent to which the reduction in implicit bias was specific to the stereotyped concept that surrounds the training program. For example, one would expect the reduction in implicit bias to be specific to illness but not to other stereotypes such as racial or gender bias. Our findings showing that only the experimental group, but not the control group, had a reduction in implicit measures speaks about the effectiveness of the interventional program but not about its specificity at the implicit bias level. Future research may include different IAT versions at the within-subject design to scrutinize this possibility.

Another important issue is to assess the extent to which the changes in implicit bias observed in the current design persist over time. Previous research revealed that stability of changes in implicit preferences are difficult to observe in available interventional techniques (Lai et al., 2016; see, however, Peck et al., 2013). While the current research does not look at long-term effectiveness, our proposed framework engaged participants in a 14-day training program unlike previous interventional programs that involved a single session at the lab. At the speculative level, we hypothesized that engaging the participants in a consecutive day-to-day program may promote memory consolidation of learned non-biased association between concepts. A consequence of such a consolidation process would be participants’ reduction in implicit bias being accompanied by an explicit awareness of the bias. Indeed, previous research on memory consolidation showed that night sleep promotes knowledge awareness (e.g., Wagner et al., 2004). If that were the case, it would suggest
that an interventional program has an impact in transforming implicit to explicit memory representations. A possible advantage of such transformation is that it may thus favour generalization (Rnaganath & Nosek, 2008), thereby promoting implicit bias reduction in other conceptual domains.

Society has an interest in finding ways to reduce levels of implicit biases among the general population. So far, most of the interventional techniques described in the literature that may help reduce implicit bias have been developed to be implemented in the lab. Though lab-based techniques offer experimental rigour and control, they may limit participants’ motivation and engagement with a task, thereby complicating the possibility of making reliable changes in implicit bias at an individual level. An alternative strategy is to take advantage of realistic activities that invoke solid individual self-engagement with a task, with the hope that this fosters strong changes at an implicit level. Current research underscores the powerful impact that performing theatre can have in reducing implicit bias. Our findings show that implicit bias towards physical illness is reduced in a group of non-professional artists after enrolling in a 14-day training program based on theatre acting. The extent to which such an interventional program has a causal effect and if so, whether such effect is specific to a specific conceptual bias (i.e., physical illness) remains to be examined in the future.

References


