

# HIV status acknowledgment and stigma reduction in virtual reality

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# HIV status acknowledgment and stigma reduction in virtual reality: The moderating role of perceivers' attitudes

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## Abstract

HIV-related stigmatization in employee selection procedures may be enacted through discrimination based on an applicant's HIV status. This study ( $N = 58$ ) investigated to what extent applying an acknowledgment strategy in a job interview setting reduces HIV-related stigma, taking into account the applicants' personal responsibility and the perceivers' attitudes toward people living with HIV (PLWH). In an immersive virtual office, virtual applicants with HIV presented themselves as part of a job application procedure. Using a 2 (acknowledgment versus non-acknowledgment)  $\times$  2 (responsible versus not responsible for the onset of the HIV-infection) within-subjects design, we hypothesized that acknowledgment and onset responsibility would yield an interaction effect as well as separate main effects. We predicted that hearing virtual job applicants acknowledging their HIV status triggers higher evaluations, especially when applicants are not held personally responsible for their infection. In addition, we hypothesized that (between-subjects) positive implicit and explicit attitudes independently moderate the relationship between acknowledgment and applicant evaluation. We found that low-onset responsible applicants were more positively evaluated than high-onset responsible applicants (main effect of onset responsibility),  $F(1, 57) = 4.31, p = 0.04$ . This effect was irrespective of the applicants' status acknowledgment (no interaction effect). Acknowledgment did, however, produce higher evaluations when participants' explicit attitudes toward PLWH were more positive,  $F(1, 57) = 7.13, p = 0.01$  (moderation effect of explicit attitudes). This study indicates that the more positive the explicit attitudes toward PLWH, the more positive the evaluations when hearing PLWH acknowledging their stigma. Theoretical and practical implications of these findings are discussed.

## 1 | INTRODUCTION

Stigma is an undesirable quality, causing the person with the stigma to be perceived as different, and, consequently, devalued within a specific social context (Bos, Pryor, Reeder, & Stutterheim, 2013; Goffman, 1963; Pescosolido & Martin, 2015). Interpersonal discrimination refers to biased treatment based on one or more stigmatized conditions that the interaction partner is believed to possess. Discrimination based on the perceived HIV status within the context of employee selection procedures is one of the ways through which

HIV-related stigmatization is enacted (Corrigan, Tsang, Shi, Lam, & Larson, 2010). People living with HIV (PLWH) who want to reenter the workforce may perceive, feel, and/or fear being stigmatized (Brooks, Martin, Ortiz, & Veniegas, 2004; Martin, Brooks, Ortiz, & Veniegas, 2003; Timmons & Fesko, 2004; Worthington, O'Brien, Zack, Mckee, & Oliver, 2012). Besides the fear of being stigmatized, health, psychological, and social barriers make it challenging for PLWH to return to work (Braveman, Levin, Kielhofner, & Finlayson, 2006; Conyers, 2004; Glenn, Ford, Moore, & Hollar, 2003; Nixon & Renwick, 2003; Rabkin, McElhiney, Ferrando, Van Gorp, & Lin, 2004;

Timmons & Fesko, 2004; Worthington et al., 2012). This is especially relevant considering that employment encourages, whereas unemployment discourages the well-being of PLWH (Blalock, Mcdaniel, & Farber, 2002).

Empirical evidence of HIV-related stigmatization in hiring PLWH from the stigmatizers' perspective (enacted stigmatization), however, is rather scarce (Corrigan et al., 2010; Drydakis, 2010; Liu, 2012). Employers' reluctance to hire PLWH seems to stem from a fear of contagion, from beliefs that PLWH are less competent (Liu, 2012) and less productive, and from the concern that the inclusion of PLWH would trigger negative attitudes or negative responses among coworkers and/or customers (Drydakis, 2010). Studies regarding other types of stigmas demonstrate that stigmatization in job application procedures usually is expressed in a subtle rather than a blatant manner (Hebl, Foster, Mannix, & Dovidio, 2002; Hebl, King, Glick, Singletary, & Kazama, 2007; Madera & Hebl, 2012, 2013; Singletary & Hebl, 2009). For instance, previous research found that with job applicants with a visible facial stigma, job interviewers spent more time looking at the job applicants (in particular at the marked facial area), recalled less information from the interview, and had a larger depletion of self-regulatory resources than with job applicants from less or non-stigmatized groups (Madera & Hebl, 2012). Likewise, interviewers respond more adversely to homosexual applicants than to apparently heterosexual applicants, by spending a shorter time interacting, by being more verbally negative, and by using fewer words (Hebl et al., 2002).

It has been argued that such stigmatization results from both reflexive and reflective reactions thereby seemingly following a dual process (Bargh, Chen, & Burrows, 1996; Chen & Bargh, 1999; Devine, 1989; Devine & Sharp, 2009; Naughton & Venable, 2012; Neumann, Hülßenbeck, & Seibt, 2004; Pryor, Reeder, Yeaton, & Hesson-McInnis, 2004). Dual process theories state that two distinct mental processes dynamically generate social cognition, emotions, and behavior: those that are automatic and those that are more controlled (Chaiken & Trope, 1999; Gawronski & Creighton, 2013; Shiffrin & Schneider, 1977; Strack & Deutsch, 2004, 2015). Stigmatization appears to initially reflect an automatic, unintentional, reflexive, instinctual, negative avoidance response. Later, the reaction becomes more controlled, conscious, and deliberative, representing a more thoughtful consideration of, for instance, the circumstances that created the condition the stigmatized person is in (Naughton & Venable, 2012; Neumann et al., 2004; Pryor et al., 2004).

International organizations (e.g., the United Nations, the World Health Organization, and UNAIDS) stress the urgency of reducing HIV-related stigma in order to tackle the HIV/AIDS epidemic (UNAIDS, 2014; WHO, 2016). Most HIV-related stigma reduction interventions target the stigmatizer, concentrating on altering the stigmatizer's cognitions, emotions, and behavior (for reviews, see: Brown, Macintyre, & Trujillo, 2003; Sengupta, Banks, Jonas, Miles, & Smith, 2011; Stangl, Lloyd, Brady, Holland, & Baral, 2013). Relatively little research has been done, however, on strategies that PLWH can apply themselves to reduce interpersonal stigmatization during social interactions (Bos, Dijker, & Koomen, 2007). One such a strategy is the *acknowledgment*

*strategy*, in which one openly addresses (or acknowledges) one's condition (Hastorf, Wildfogel, & Cassman, 1979; Hebl & Kleck, 2002) in a situation in which one's stigmatized condition is already known rather than novel to the interaction partner. One's awareness about the interaction partner's awareness of one's stigmatized condition distinguishes acknowledgment from self-disclosure (Brohan et al., 2012; Chaudoir, Fisher, & Simoni, 2011; Collins & Miller, 1994; Jans, Kaye, & Jones, 2012; Roberts & Macan, 2006; Stutterheim et al., 2011). Directly acknowledging one's stigmatized condition is thought to reduce interpersonal stigmatization by directly attending to the cause underlying the tension and the awkwardness that may be felt during the social interaction (Hebl & Kleck, 2002).

The reinforcing influence of the personal *responsibility* on stigmatization, and on HIV-related stigmatization, in particular, has repeatedly been demonstrated (Bos, Schaalma, & Pryor, 2008; Dijker & Koomen, 2003; Weiner, Perry, & Magnusson, 1988). It is argued that the effects of the acknowledgment strategy depend on the degree to which people are held personally accountable for their condition (Bordieri & Drehmer, 1988; Hebl & Kleck, 2002). For instance, when adopted by persons with a disability in an interview setting, the acknowledgment strategy has been found to advance the social interaction (Hastorf et al., 1979; Hebl & Kleck, 2002) and positively influence selection evaluations, especially when it was salient that obtaining the stigmatized condition was out of the individual's control (Bordieri & Drehmer, 1988). Similarly, when adopted by gay and lesbian applicants in a job interview setting, the acknowledgment strategy was found to reduce interpersonal discrimination (Singletary & Hebl, 2009). However, people who are obese, a condition for which people are often held personally accountable (Brownell, 1992; Crandall & Martinez, 1996), are evaluated negatively rather than positively after acknowledging their stigma (Hebl & Kleck, 2002). Hence, it seems that stigma acknowledgment may not produce the desired effects or may even yield contra-effects when an interaction partner with a stigma is perceived to be personally responsible for the condition.

Similar to a stigmatizing response, a stigmatizing attitude appears to be driven by a dual process, consisting of implicit and explicit components (Bargh et al., 1996; Chen & Bargh, 1999; Devine, 1989; Devine & Sharp, 2009; Naughton & Venable, 2012; Neumann et al., 2004; Pryor et al., 2004). The effects of the acknowledgment strategy may be moderated by the attitude toward the target (as was found by Hagiwara, Wessel, & Ryan, 2012, who used an explicit measure of attitudes). The more positive the implicit and explicit attitudes, the more positive the effects of the acknowledgment strategy are expected to be. Likewise, the more negative implicit and explicit attitudes, the lower the effects of the strategy are expected to be. Evidence for the latter has been provided by Hagiwara et al. (2012) who found that in high-prejudiced people, in particular, race acknowledgment brought about negative as opposed to positive evaluations. Another factor shown to play a role is the timing of the acknowledgment, as applicants who acknowledged earlier rather than later in the job interview were evaluated more favorably (Hebl & Skorinko, 2005).

Implicit or explicit attitudes and enactments of social stigma become most relevant within the context of social interactions (Bos

et al., 2013; Hebl & Dovidio, 2005; Varas-Díaz, Serrano-García, & Toro-Alfonso, 2005). Social interactions, however, are not easily experimentally controlled, and therefore provide challenges for the empirical study thereof. Immersive virtual environment technology (IVET) offers social sciences a promising opportunity to empirically study real-life simulating conditions while continuously controlling the appearance and behavior of virtual interaction partners (Blascovich et al., 2002; Bombari, Mast, Canadas, & Bachmann, 2015; Fox, Arena, & Bailenson, 2009). Immersion within a virtual environment refers to the experience of feeling entirely immersed within the presented virtual world and being able to move and look around as if in a real world (Bombari et al., 2015). Provided that humans apply real-life social norms in a virtual environment (Yee, Bailenson, Urbanek, Chang, & Merget, 2007), interpersonal interactions with stigmatized individuals can be properly studied using IVET, by making it possible to construct experimental settings that are both reasonably ecologically valid as well as highly standardized (Dotsch & Wigboldus, 2008; Gillath, McCall, Shaver, & Blascovich, 2008; Toppenberg, Bos, Ruiters, Wigboldus, & Pryor, 2015). Another advantage of using IVET is that experiments using this technology can be easily replicated (Blascovich et al., 2002; Bombari et al., 2015).

Within the context of a job interview, stigmatization may be revealed through biased evaluations, decisions, and stigmatizing attitudes. The current study aimed to gain insight into the effect of acknowledging one's stigmatized status on the process of stigmatization. More specifically, we attempted to investigate whether the acknowledgment strategy when applied by job applicants with HIV in job interviews reduces stigmatization, taking into account the personal responsibility for the onset of the infection. Moreover, we explored whether the relationship between acknowledgment and applicant evaluations is moderated by the perceiver's attitudes toward PLWH. Based on the possibility that explicit attitudes may have a different influence than implicit attitudes (Naughton & Venable, 2012; Neumann et al., 2004; Pryor et al., 2004), we chose to assess the influence of both implicit and explicit attitudes. We used an immersive virtual office in which virtual applicants presented themselves as part of a job application procedure. We predicted that the acknowledgment of HIV results in more positive applicant evaluations (main effect of acknowledgment), including increased willingness to work together with the target in the future and increased liking, but only when the target is not perceived to be responsible for the onset of the infection (interaction effect of acknowledgment and personal responsibility). In addition, we hypothesized that having more positive implicit and explicit attitudes toward PLWH positively affects the relationship between acknowledgment and applicant evaluations.

## 2 | METHOD

### 2.1 | Participants

Advertisements were placed in the psychology and medical faculty of a University in the south of the Netherlands. Healthy heterosexual participants who reported to be unfamiliar with similar IVET studies

were recruited. Only heterosexual participants were recruited to keep the possibly influencing factor of sexual orientation constant. A total of  $N = 58$  students participated in the experiment, of which 30 were females (mean age = 22.69;  $SD = 3.40$ ). The greater majority of the participants were bachelor students, a small number were master's students, and two were not students. The larger majority of the participants were studying at the psychology faculty and a few were studying at the medical faculty. Participants received a €10 gift voucher for their participation.

### 2.2 | Design

The experiment was divided into two parts. In the first part, participants performed a task within an immersive virtual environment in which they had to evaluate virtual job applicants who presented themselves as part of a job application procedure. For this task, we used a  $2 \times 2$  within-subjects experimental design, manipulating the virtual applicants' acknowledgment (yes versus no) of their HIV status and their personal responsibility (high versus low) for the onset of the illness. For each experimental condition, one applicant was presented. Participants were confronted with one practice trial presenting a healthy participant followed by four experimental trials. The experimental trials were presented in a randomized order. The acquired data were used to test for main and interaction effects of these manipulations on how applicants were evaluated.

The second part consisted of two computerized tasks, one measuring implicit attitudes and the other measuring explicit attitudes toward PLWH. The data gathered from the attitudinal measures were included as moderators into the above-mentioned design, to test whether attitudes moderated the relationship between acknowledgment and applicant evaluations.

Ethical approval for this study was obtained from the Ethical Committee of the Faculty of Psychology and Neuroscience at a university in the south of the Netherlands.

### 2.3 | Apparatus

The experiments were conducted at a university in the south of the Netherlands in an immersive virtual environment research lab, in a 5.7 by 7.8 meters sized room. The IVET setup contained a number of cameras placed across the room signaling the optical markers located at the back and front of the stereoscopic head-mounted display (HMD) and making precise tracking of the participant's position and orientation possible. The HMD contained built-in screens that were placed in front of the eyes, displaying the graphics of the IVE rendered by a computer for each eye separately. The computer used was a laptop carried on the back gathering the participant's position and head movement information, rendered to the HMD, thereby creating the experience of being immersed within a 3D virtual environment.

### 2.4 | Virtual environment

The virtual environment was a simple office room with a desk and the virtual applicant sitting behind the desk (see Figure 1). The size

and dimensions of the real desk corresponded precisely with the virtual desk. Hence, the participant was seated in front of both the real as well as the virtual desk. One secretary and five 30-year-old looking male virtual applicants were created. The factors age, extent of attractiveness, face symmetry and ethnicity appearance (European) were kept constant for the faces of all applicants. The hair color and style varied, but could all be considered ordinary looking. The eye color varied too. After walking into the room, each candidate would take a seat on the chair at the same desk in front of the participant. Every time the secretary would enter the room, she would stand in front of the participant. A piece of paper on a paper holder was located on the desk presenting the response options for the self-report measure presented orally by the secretary.

## 2.5 | Elevator pitches/audio recordings

Elevator pitches, that is “short, spoken overviews of an idea or product, intended to elicit the interest and support of the listener” (Jourdan Jr., 2012; Stoltzman, 2006) were recorded, one for each of the virtual applicants. Six actors were hired to record the elevator pitches and the secretary's voice. The actors were selected based on the neutrality of their sound, pitch, and accent. The actors read out loud the script. The content of the pitch was structured over five different variations per five parts. Each part subsequently consisted of (a) why the job appeals to him, (b) the acknowledgment of having HIV in the acknowledgment condition (this part is empty for the non-acknowledgment condition), (c) what the participant studied, including some relevant aspects that he learned from his studies, (d) one related previous work experience, and (e) what the applicant thinks he can mean for the organization and vice versa. The elevator pitches were randomly allocated to individual applicants. In addition, while maintaining the same structure across applicants, within each of the five levels, the content versions in the experimental trials (not

in the practice trial) were presented in a randomized order. These randomizations were done to ascertain that the found results could be ascribed to manipulation rather than to the applicant appearance, the content, or the choice of words of the pitch. The pitches were randomly assigned to the virtual targets for each experimental session.

## 2.6 | Procedure

Upon arrival at the research lab, the participant was briefly given information from the experimenter about the procedure of the experiment. After signing the informed consent, the participant got to wear the HMD, thereby entering a virtual office room, where a virtual secretary provided the task instructions. At the start of the immersive virtual environment task, the virtual secretary walked into the virtual office, stopped to stand in front of the participant, introduced herself, and provided the task instructions:

Hello, I'm the secretary of this organization. I would like to ask you to imagine that you just finished your Master degree at this university. After your graduation, you started working as a project leader for a municipal institution. This institution asked you to hire a new employee for a project that you would work together on. The aim of this project is to develop and implement a policy concerning the municipality's best practices on how to deal with people living with HIV/AIDS. The project will take twelve weeks and you and the new colleague will work together closely. As the project is about HIV/AIDS, it is important to select a candidate who is familiar with the topic. Also, the vacancy requires strong communicative, social and analytic skills. Soon, you will subsequently listen to



**FIGURE 1** The virtual environment with one of the applicants sitting behind the desk [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



five applicants whom all will shortly tell something about themselves. Before each candidate enters, I will shortly give you some of the information from the application letter. After I leave the room, the candidate enters and takes place in the seat in front of you. You don't have to talk to the candidate. All candidates have HIV, except for the first one. All candidates are heterosexual. Please listen carefully to all candidates. After each candidate is gone, I ask some questions about the candidate in concern. These questions you can answer orally. Good luck.

After these instructions, the secretary left the room and the first applicant entered. The elevator pitches delivered by the candidates took 40 s each. The first trial with the healthy applicant was a practice trial. The order in which the four applicants with HIV were presented was randomized across participants, half of which applied the acknowledgment strategy.

After completing the virtual task, the HMD was taken off and the participant joined the experimenter to another part of the lab. Here, the participant was seated in front of a laptop to perform an implicit association task (IAT), and an explicit measure of attitude by means of a self-report questionnaire.

## 2.7 | Manipulation of acknowledgment

When a candidate acknowledged his HIV status, he said: "As you know, I have HIV." When a candidate did not acknowledge his HIV status, he did not say anything.

## 2.8 | Manipulation of personal responsibility

Before every next applicant entered the room, the secretary introduced the applicant, including the mentioning of how the applicant got HIV-positive (manipulation of personal responsibility) and then left the room. In the responsible condition, the secretary said: "The next candidate wrote in his letter that he has HIV. He got infected years ago through unsafe sex." In the non-responsible condition, the secretary said: "The next candidate wrote in his letter that he has HIV. He got this a long time ago through a necessary blood transfusion during his stay abroad."

## 2.9 | Evaluative items

The secretary introduced the upcoming statements and response options as follows:

You will now hear five statements about this candidate. Please indicate on a seven-point scale to what extent you agree with each of the statements. On this scale, 1 = completely disagree, 2 = disagree, 3 = slightly disagree, 4 = not disagree, but also not agree, 5 = slightly agree, 6 = agree, and 7 = completely

agree. You will get enough time for responding to the statements, each time 10 seconds.

Three out of five statements presented by the secretary served an evaluative purpose; these evaluative statements were: "The candidate seems to fit the position," "I like this candidate," and "I would like working together with this candidate" (Cronbach's  $\alpha = 0.87$ ).

## 2.10 | Manipulation check

The two remaining statements were presented to be able to check the degree to which the manipulation was successful, using the same response scale. The manipulation check statements were: "The candidate is personally responsible for getting HIV" and "The candidate mentioned he had HIV." The large majority 90.52% of the participants correctly indicated (represented by ratings 5, 6, or 7) that the candidate mentioned his HIV status, and also 80.17% correctly stated that the candidate had not mentioned his HIV status. A smaller majority 69.83% of the participants correctly said that the candidate was responsible for having HIV, and 90.52% correctly indicated that the candidate was not responsible for becoming HIV-positive.

## 2.11 | Implicit association task

The IAT is a reaction time-based computer task that is assumed to assess implicit attitudes toward two target concepts (Greenwald, McGhee, & Schwartz, 1998). Based on a paradigm similar to the one used by Decety, Echols, and Correll (2009), our HIV-IAT requires participants to quickly assign stimulus items (words and pictures) appearing in the middle of the computer screen to either the attribute category (bad versus good) or target category (person with AIDS versus healthy person) items randomly presented on the above left and right sides of the screen, using a left or a right key response correspondingly. The stimulus items presented together with the target items were pictures of Caucasian male faces with a neutral expression obtained from the Radboud Faces Database (RaFD; Langner et al., 2010) while the stimulus items presented together with the attribute items were word items. Through a computerized learning task performed just before starting the IAT, participants effectively learned to make the correct associations. The experiment consisted of seven blocks, starting with a target category practice block (person with HIV versus healthy person), followed by an attribute category practice block (good versus bad). Next, half of the participants were given a practice block and then a test block in which the attribute and target category items were combined to create stereotype-compatible trials (good + healthy person versus bad + person with HIV). After that, the attribute and target category items were reversed in a final stereotype-incompatible practice block (good + person with HIV versus bad + healthy person) followed by a final test block. The other half of the participants were presented with the reversed order of stereotype-compatible and incompatible practice and test blocks. All five practice blocks contained 20 trials each and the two test blocks contained 40 trials each. Errors were indicated

by a red cross appearing beneath the stimulus item and the next trial would start only after making the correct categorization.

In none of the trials the response rate was below 300 ms or above 10 s. In accordance with the improved IAT scoring algorithm (Greenwald, Nosek, & Banaji, 2003), the  $D_5$ -measure was calculated, including the combined blocks of both the practice and the test trials and replacing errors with a penalty computed by subtracting the mean of the correct latencies per block plus two times the standard deviation. By subtracting the mean response latencies of the stereotype-compatible from the stereotype-incompatible blocks, the size of the IAT effect was computed. Larger sizes indicate stronger automatic associations between “unpleasant” and “person with HIV,” thereby presuming to reveal stronger implicit stigmatization.

### 2.12 | Explicit self-reported attitudes

A computer-generated scale to measure self-reported attitudes toward PLWH (Based on: Visser, Kershaw, Makin, & Forsyth, 2008) was used, with 5-point Likert-type response options ranging from 1 = strongly disagree to 5 = strongly agree. The scale contained 12 items such as “I think people with HIV should be ashamed of themselves” and “I would feel uncomfortable around people with HIV” (Cronbach's  $\alpha = 0.86$ ). Higher scores on this scale indicate higher negative explicit attitudes toward PLWH.

### 2.13 | Analyses

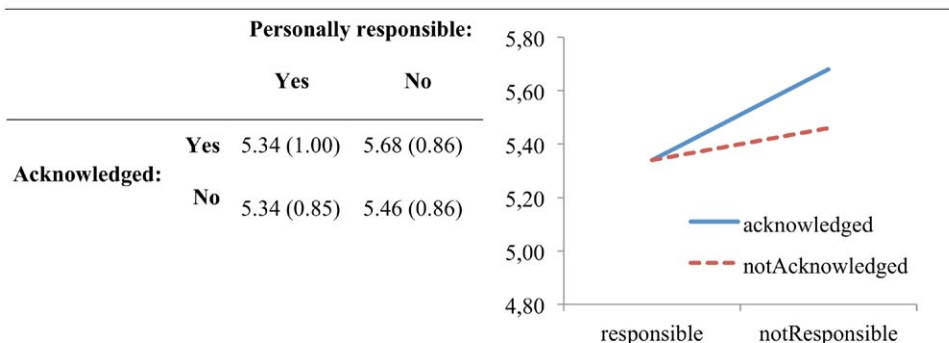
A  $2 \times 2$  repeated measure ANOVA was performed to test whether applicant evaluation is affected by acknowledgment and personal responsibility (main effects) and the interaction between these two (interaction effect). To test whether the relationship between acknowledgment and personal responsibility was moderated by implicit attitudes, the scores on the implicit and explicit attitude measures were each added as moderators into the General Linear Model, thereby extending the previous ANOVA into a  $2 \times 2 \times 2$  mixed factorial design.

## 3 | RESULTS

Figure 2 presents the mean applicant evaluation scores per condition. The  $2 \times 2$  repeated measure ANOVA did not confirm the hypothesized interaction effect between acknowledgment and personal responsibility,  $F(1, 57) = 1.07, p = 0.31, \eta_p^2 = 0.02$ . However, we did find a main effect of personal responsibility, meaning that applicants whom were suggested to not be responsible for the onset of their infection were more positively evaluated ( $M = 5.57, SD = 0.67$ ) than applicants whom were suggested to be responsible ( $M = 5.34, SD = 0.70, F(1, 57) = 4.31, p = 0.04, \eta_p^2 = 0.07$ ). The main effect of acknowledgment was not significant,  $F(1, 57) = 1.09, p = 0.30, \eta_p^2 = 0.02$ ; applicants who acknowledged their HIV status ( $M = 5.51, SD = 0.70$ ) were not evaluated more positively than applicants who did not acknowledge ( $M = 5.40, SD = 0.65$ ).

Including the implicit and explicit attitude measures separately (as moderators) into the General Linear Model revealed an interaction effect between explicit attitude and acknowledgment,  $F(1, 56) = 7.14, p < 0.01$ . Explicit attitude did not interact with personal responsibility,  $F(1, 56) = 0.00, p = 0.98$ , nor did it affect the interaction between acknowledgment and personal responsibility,  $F(1, 56) = 0.48, p = 0.29$ . To further examine the relationship between explicit attitude and acknowledgment, a high-centered and a low-centered variable of the explicit attitude measure were computed, based on the centered values minus and plus the standard deviation, respectively. Simple effect analyses found an effect of acknowledgment when the attitudes were more positive (low-centered),  $F(1, 57) = 7.13, p = 0.01$ , but not when attitudes were more negative (high-centered),  $F(1, 57) = 1.27, p = 0.27$ . No interaction effects were found for the implicit attitude measure ( $p$ 's  $> 0.40$ ).

The IAT data demonstrated that stereotype-compatible trials ( $M_{latency} = 918.14; SD_{latency} = 495.68$ ) were more quickly responded to than stereotype-incompatible trials ( $M_{latency} = 1256.18; SD_{latency} = 478.20$ ). Taking into account the error rate ( $M_{error\ rate} = 0.07, SD_{error\ rate} = 0.06$ ) to compute the  $D_5$ -measure based on Greenwald et al. (2003), the IAT effect ( $M_{IAT-effect} = 0.69, SD_{IAT-effect} = 0.38$ ) was positively different from zero,  $t(57) = 14.05, p < 0.01$ , indicating that participants in general had stronger negative implicit



Note: higher scores indicate more positive applicant evaluations (N = 58).

**FIGURE 2** Means (and standard deviations) of applicant evaluations per condition [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

associations with PLWH than with healthy people. Self-reported explicit attitudes toward PLWH resulted in an average score of  $M = 1.85$  ( $SD = 0.60$ ). The explicit measure of attitude toward PLWH did not correlate with the implicit measure ( $r = 0.12$ ,  $p = 0.37$ ).

## 4 | DISCUSSION

The aim of this study was to examine the effects of HIV status acknowledgment on stigmatization, taking into account the personal responsibility for getting infected. Another aim was to test whether the success of status acknowledgment relied on the perceiver's implicit and explicit attitudes toward PLWH. Using an immersive virtual environment, we studied whether hearing male applicants with HIV acknowledging or not acknowledging their stigmatized status, and who are or who are not responsible for the onset of their infection, affected evaluations in a job interview setting.

Our primary analysis did not yield a main effect of acknowledgment; neither did it produce an interaction effect of acknowledgment with personal responsibility. We did find that applicants high in personal responsibility were evaluated less positively than applicants low in personal responsibility, but this effect was not dependent on applicants' acknowledgment. These primary findings seem to indicate that evaluations of applicants with HIV are driven by the perceived personal responsibility, regardless of whether applicants acknowledged their stigmatized status or not. This influence of personal responsibility on HIV-related stigmatization (Bos et al., 2008; Dijker & Koomen, 2003; Weiner et al., 1988) and on job selection bias (Bordieri & Drehmer, 1988) corresponds with previous evidence. However, our secondary analysis tested the hypothesized moderation effect of perceiver's attitudes toward PLWH, and uncovered that applying the acknowledgment strategy is fruitful after all, but only when the perceiver's explicit attitudes toward PLWH are positive. In addition, by contrasting our data based on (more versus less positive) perceivers' explicit attitudes, personal responsibility no longer seemed to influence evaluations.

Our findings add to previous evidence for the effectiveness of the acknowledgment strategy in an interview setting found for persons with a physical disability (Hastorf et al., 1979; Hebl & Kleck, 2002) and for gay and lesbian applicants (Singletary & Hebl, 2009). In particular, our findings contribute to a broader perspective on the types of statuses and conditions acknowledgment may work for. In line with prior research (Hagiwara et al., 2012), our findings emphasize the importance of taking into account the perceiver's attitudes in studying status acknowledgment. Our findings not only indicate that acknowledgment is effective when perceivers' explicit attitudes are positive, but also that acknowledgment is not effective in interactions with people who hold less positive attitudes toward PLWH. Considering that the interaction partner's attitudes toward PLWH are likely to be unknown, applying the strategy, in any case, may be worthwhile.

Acknowledgment may work differently, however, for different types of stigmatized conditions. With regard to racial status acknowledgment, Hagiwara et al. (2012) found a moderation effect of

negative attitudes, indicating that high-prejudiced people express negative rather than positive evaluations after hearing the target acknowledging their ethnic background (Hagiwara et al., 2012). Likewise, obese people were found to be evaluated negatively rather than positively after acknowledging their stigma (Hebl & Kleck, 2002). Even though attitudes had not been tested in that study, based on other research it may be assumed that obesity is a condition for which many people hold biased attitudes (Puhl & Brownell, 2001; Schwartz, Vartanian, Nosek, & Brownell, 2006; Sikorski et al., 2011; Vartanian, 2010). Next to held attitudes toward the target group, the visibility of the stigmatized or prejudiced condition may influence how status acknowledgment in social interaction is received. The factors attitudes and visibility may also interact with each other. For instance, visible disability, ethnicity, and obesity all are visible, whereas living with HIV is not, and because of that acknowledgment may trigger different evaluations. Acknowledging a non-visible stigma may be perceived as an act of courage, whereas acknowledging a visible stigma may be perceived as an appeal for special treatment. Held attitudes toward the target group may, in turn, influence this relationship.

Previous studies postulated that explicit attitudes reflect a more conscious mental construct, whereas implicit attitudes reflect a more unconscious mental construct (Chaiken & Trope, 1999; Gawronski & Creighton, 2013; Shiffrin & Schneider, 1977; Strack & Deutsch, 2004, 2015). Hearing another acknowledging one's stigmatized status represents a conscious rather than an unconscious mental process. Evaluating another also involves a more conscious than an unconscious process. The suggestion that explicit attitudes, the perception of status acknowledgment, and person evaluation all operate at a more conscious level, whereas implicit attitudes operate at a more unconscious level of social cognition, may add to our understanding of why explicit but not implicit attitudes in our study moderated the relationship between status acknowledgment and applicant evaluation. In addition, people with more positive explicit attitudes may be more motivated to control their stigmatizing beliefs and align their evaluations accordingly than people with negative explicit attitudes (Dunton & Fazio, 1997; Pryor et al., 2004). Perhaps, such motivation to control prejudice made persuasion by the acknowledgment strategy more likely, thereby contributing to our found effect of stigma acknowledgment on evaluation.

Although status disclosure reveals one's status, whereas status acknowledgment recognizes one's (already known) status to another (Brohan et al., 2012; Chaudoir et al., 2011; Collins & Miller, 1994; Jans et al., 2012; Roberts & Macan, 2006; Stutterheim et al., 2011), our findings may also be relevant within the context of status disclosure. After all, besides the revealing aspect, status disclosure essentially involves a (first-time) status acknowledgment.

### 4.1 | Limitations of this study

Considering the novelty of our study both concerning the topic as well as the used methodology, our findings should be regarded exploratory. Relatively little is known about the effects of applying an



acknowledgment strategy on stigma reduction (Hastorf et al., 1979; Hebl & Kleck, 2002). Our study is the first to investigate the effects of acknowledgment on HIV-related stigma reduction. More confirmative and extending evidence is required to gain more insight into the conditions under which the acknowledgment strategy is beneficial, dispensable, or disadvantageous. We suggest for future research to add more evaluative items to obtain a better understanding of the underlying reasons for selecting or not selecting a particular candidate.

Measuring implicit and explicit attitudes toward PLWH after testing our manipulations instead of before may have provided a limitation to this study. Being exposed to the manipulations first may have influenced performance on the attitudinal measures that followed afterwards (probably the explicit attitudes more than the implicit attitudes). Choosing the reverse order, however, would also potentially cause confounding effects, perhaps even more than on the order that we chose for. After all, activating mental concepts about HIV-related attitudes shortly before the start of the immersive virtual environment task that provided our manipulations may have led people to evaluate the applicants differently, conceivably more socially desirable.

Using IVET, this study established a highly controlled and immersive environment, a context that is closer-to-realistic than the context that would have been created with a computerized task in front of a computer screen (Blascovich et al., 2002; Bombari et al., 2015). Nevertheless, for this experiment, we utilized IVET only to deliver independent, contextual variables. Considering that we did not measure dependent variables using this technology, the added value IVET may have over other technologies may be questioned. Replication studies using a similar methodology as well as comparative studies that use different methodologies are needed to be able to warrant conclusions on whether IVET indeed has the added value we expect it to have.

In addition, our choice for using virtual instead of real humans traded-off biological realism for experimental control: even though real speech spoken by credible actors was used for the audio stimuli, sitting in front of a virtual human cannot measure up to the experience created when sitting in front of a real human. Also, when the virtual humans were presented as talking, the mouth movements were not synchronized with the audio voices. However, none of the participants reported this as being a disturbing factor and the non-synchronicity was the same across all conditions. Without disregarding the experimental limitations of using IVET, its advantages of experimental control (including uniformity across conditions), social interaction, and lower costs may outweigh the advantages related to using real human actors or the use of vignettes.

Another limitation concerns the use of a student sample. While our cover story was presented in a way students can relate to as they are accustomed to working project-based, the use of a student sample, rather than a sample of people who have a management position, constraints the generalizability of our findings to the working population.

## 4.2 | Conclusions

Learning more about the types of strategies PLWH can apply to reduce stigma in the other is of significant scientific and practical value. As yet, however, we know little about what are and what are not beneficial things a person with HIV can say in a conversation with a potential stigmatizer (see Bos et al., 2007 for a related study). The current study highlights the relevance of taking into account the perceivers' attitudes as a moderating factor in studying stigma-reduction strategies. Focusing on the acknowledgment strategy, our findings suggest that, within the context of a job interview, when the interviewer's explicit attitudes are more positive, acknowledging ones HIV status is more likely to be effective. In addition, our findings suggest that if applying the acknowledgment strategy does not help, it does not harm either. Confirmative research is necessary before strong conclusions can be drawn.

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