Exploration of Intervention Strategies to Reduce Public Stigma Associated with Gambling Disorder

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Conflicts of interest

Kirsten Brown declares no conflicts of interest in relation to this manuscript.

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Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Approval was gained from the CQUniversity Human Research Ethics Committee - Approval number 2018-082.

Exploration of Intervention Strategies to Reduce Public Stigma Associated with Gambling Disorder

Abstract

Stigma associated with gambling disorder is complex, and is a key obstacle that prevents sufferers from seeking early help for their condition. However, little research has addressed how best to reduce gambling stigma. This study explored the effectiveness of video intervention styles, that have been used to reduce public stigma for conditions such as mental illness and substance use disorders. This was done to determine which would be most suitable, considering the unique characteristics of gambling disorder. An online survey of 164 people living in Australia was conducted which examined attitudes toward gamblers experiencing problems before and after an intervention. Participants were randomly allocated to one of three interventions (contact, education, advocacy) or a control video. The study found that each intervention was associated with changes to different components of stigma. Importantly, the education intervention increased labelling, but reduced stereotype endorsement and anger. Advocacy also reduced anger, attributions of character flaws, and anticipated discrimination and recoverability. While these interventions were generally effective at reducing stigma, the contact intervention was mixed, effectively intervening for some aspects of stigma, but increasing stigma on others. No single intervention reduced all aspects of stigma, suggesting that a complementary approach utilising specific elements of each intervention style could be used to deliver relevant information and effectively reduce stigma. Taken together, this suggests that research should be conducted into comprehensive, combined interventions, that include aspects of all three intervention styles, in an attempt to reduce more aspects of stigma simultaneously.

Keywords

Stigma, stigma reduction, gambling disorder, education, contact, advocacy

Australia has the greatest per capita expenditure of any country worldwide with almost 80% of Australians gambling every year (Armstrong and Carroll 2017). The Australian 'gamble responsibly' campaign simultaneously normalises gambling and strengthens the stereotype of the irresponsible, impulsive 'problem gambler'. This encourages the belief that fundamental differences exist between 'problem' and recreational gamblers (Miller and Thomas 2017) leading to high levels of public stigma for the one to four percent of Australians that do experience significant problems (Gainsbury et al. 2014).

Effects of Stigma

Stigma delays problem recognition. The 'problem gambler' stereotype differs greatly from the self-concept of those experiencing problems, meaning the condition is often hidden, even from themselves (Carroll et al. 2013). Those experiencing problems may conceal the extent of their gambling and withdraw from regular relationships, associating more with other gamblers less likely to judge their behaviour (Hing et al. 2015; Russell et al. 2018). Ultimately, those with gambling disorder may internalise negative societal attitudes, perceiving their problem as a personal failing, leading to feelings of shame and worthlessness (Baxter et al. 2016; Hing, Nuske, et al. 2016).

Upon recognition, attempts may be made to overcome the problem alone to avoid judgement. Additionally, concerns about the quality and efficacy of treatment, the therapist's attitudes and potential lack of appropriate knowledge of their 'uncommon' condition, which may not be taken seriously, may result in distrust (Derevensky and Gilbeau 2015; Hing and Russell 2017; Itäpuisto 2019; Suurvali et al. 2009). World-wide, less than 10% of those experiencing gambling problems seek treatment, in part, due to gambling stigma (Gainsbury et al. 2014). Treatment is often only sought when the situation reaches crisis (Hing et al. 2011), yet seeking help is vital to minimise harm, which affects not just the individual, but their family, friends and the broader community (Browne et al. 2016). Equipping people closest to those experiencing gambling problems with information to help understand the condition may also erode a barrier to treatment as they may play a vital role in prompting help-seeking behaviour (Itäpuisto 2019; Rodda et al. 2018).

Nature of Stigma

Stigma is broadly defined as discrediting attitudes and judgements that reduce an individual's status and lead to discrimination (Goffman 1963). Created through processes of *labelling* and *stereotyping*, which create division between stigmatised and non-stigmatised groups, subsequent *social distancing* (*separating*) leads to *status loss* and *discrimination* (Link and Phelan 2001). Sigma applies to multiple dimensions of conditions including; the condition's *concealability*, *course/recoverability*, *disruptiveness*, *peril*, and *origins* (Jones et al.

1984). Link and colleagues (2004) noted that emotional reactions - *pity*, *anger* and *fear* - importantly affect behaviour and can be detected by stigmatised individuals (Link et al. 2004). Thus, stigma is a complex concept comprised of processes that create division and emotional reactions to dimensions of stigmatised conditions.

Gambling disorder shares similarities with, and importantly differs from, other stigmatised conditions affecting its level of stigma. Disruptive and dangerous conditions attract greater stigma; gambling disorder is deemed more disruptive but less dangerous than alcohol use disorder (Hing, Russell, Gainsbury, et al. 2016). Termed the 'hidden addiction' (Ashubwe and Miano 2018), gambling disorder is easier to conceal than substance use disorders (Hing, Russell, Gainsbury, et al. 2016). This may increase the perceived rarity of gambling disorder, which may, consequently, be considered deviant, leading to increased stigma (Kay Bartholomew Eldredge et al. 2016). Recoverable conditions attract less stigma, but only if the individual is attempting to recover (McGinty et al. 2015). This may increase stigma for gambling disorder because, while commonly viewed as recoverable, many do not seek treatment (Gainsbury et al. 2014; Hing, Russell, Gainsbury, et al. 2016). Like substance use disorders, gambling disorder is perceived to be within the individual's control, which increases anger and punishing behaviours and reduces pity (Crapanzano et al. 2014). Gambling disorder has recently been classified as a behavioural addiction (American Psychiatric Association 2013), due to similarities with other substance use disorders such as tolerance and withdrawal symptoms and neurobiological mechanisms (Grant et al. 2010; Yau and Potenza 2015). The concept of behavioural addictions has been contentious, as research supporting the underlying biochemistry has been limited but has been sufficient enough to conceptualise gambling disorder in this way (Petry 2006; Yau and Potenza 2015). Public understanding of the neurochemical similarities between gambling disorder and other substance use disorders may, understandably, be minimal (Konkolÿ Thege et al. 2015) leading to the perception that individuals should simply be able to stop gambling (Hing et al. 2015).

Understanding the precise nature of gambling-related stigma is necessary to inform both the content included in stigma reduction programs and the best method of delivery (Thomas et al. 2016). To date, there has been little exploration of stigma reduction strategies specific to gambling disorder (Thomas et al., 2016). Hence, exploring strategies used for other stigmatised conditions is necessary.

Types of Interventions

Contact, *education*, and *advocacy*/*protest* methods have been used for other stigmatised conditions and their effectiveness have depended, in part, on the included content (Corrigan et al. 2012).

Contact.

Contact interventions aim to erode negative stereotypes and feature individuals sharing their experiences of the condition, including their challenges and recovery process (Arboleda-Flórez and Stuart 2012). Broadly, contact interventions enhance empathy and reduce anxiety by addressing public uncertainties surrounding conditions (Thornicroft et al. 2016). Featuring multiple people in an intervention could increase the chance that the public could sympathise with at least one individual (Kay Bartholomew Eldredge et al. 2016) and more effectively challenge the stereotype as single individuals could be seen as isolated exceptions (Corrigan et al. 2012). While generally the most effective intervention style, contact interventions may be mixed; dependent on public awareness and familiarity with gambling disorder (Corrigan et al. 2012; Hing, Russell, and Gainsbury 2016; Holmes et al. 1999).

Education.

Education interventions overcome negative attitudes by countering misinformation (Arboleda-Flórez and Stuart 2012). Explaining mechanisms involved in the development and maintenance of gambling disorder, and challenging factors that contribute to the negative stereotype, may increase the effectiveness of this style (Kay Bartholomew Eldredge et al. 2016). However, delivering facts may lead to labelling the condition which may emphasise differences between the general public and the stigmatised group and lead to greater desire for social distance (Kvaale et al. 2013; Palmer et al. 2018). Like contact, the effectiveness of education may be mixed, based on awareness and familiarity with the condition (Holmes et al. 1999).

Advocacy.

Advocacy (including *protest*) interventions reframe conditions as social justice issues, objecting to the negative stereotypes associated with a condition (Arboleda-Flórez and Stuart 2012). While this has not effectively reduced stigma for mental illness (Corrigan et al. 2012), advocacy has been endorsed as a potential stigma reduction method for gambling disorder (Thomas et al. 2016). Highlighting governmental conflict of interest and gaming industry tactics may redirect some responsibility currently placed primarily on the gambler and reduce anger (Hancock and Smith 2017; Miller and Thomas 2017; Thomas et al. 2016).

A range of delivery methods have been used for interventions aimed at reducing stigma for substance use disorders from pamphlets to motivational interviewing (Livingston et al. 2012). Audio-visual presentations can vividly convey emotion and, ultimately, increase persuasiveness (Appiah 2006) to overcome the stigma associated with gambling disorder. This format can also be feasibly delivered to a broad audience, such as through the media, so may be well suited for public stigma reduction interventions (Winkler et al. 2017). Brief

audio-visual interventions, as short as seven minutes, have been effective in reducing mental illness stigma (Winkler et al. 2017).

The Current Study

Following on from stigma research conducted by Hing and colleagues (2015) and Horch and Hodgins (2008), the current research compared three intervention styles to reduce public stigma. *Contact*, *education* or *advocacy* style audio-visual presentations were shown to separate experimental groups to ascertain the effect of each style on each conceptualised aspect of stigma. The study investigated whether intervention styles would reduce stigmatising attitudes toward those with gambling disorder by exploring their effects on each component of stigma. It was also of interest to determine whether one intervention style was better than others at reducing each particular aspect of public stigma.

Previous research has indicated that different demographics and personal experiences with gambling can predict stigmatising attitudes (Hing et al. 2015). Consequently, this information was collected to consider as potential covariates. The dual systems model of stigma indicated the need for a control group, as stigmatising attitudes can improve with the passing of time. A person's initial, immediate, *reflexive reaction* is often more negative and typically based on the emotions of anger and fear that increase stigma. Over time, more thoughtful, *reflective reactions*, associated with slower to emerge feelings of pity, may reduce stigma (Kay Bartholomew Eldredge et al. 2016).

No formal hypotheses were created due to the exploratory nature of the study. However, the analyses were designed to test which aspects of gambling stigma the interventions would change and how each style would compare on each dimension of stigma.

Method

Participants

Participants were recruited via social media, with a combination of snowball sampling and paid advertising. The only inclusion criteria were being aged 18+ and living in Australia. 344 respondents started the survey; 177 were excluded as they were incomplete and three because they failed data quality checks. The final sample of 164 participants were mostly female (n = 115, 46 males, 3 non-binary), and aged between 18-78 (M = 43.08, SD = 13.33). Educational level ranged between Year 10 and post-graduate qualifications with more than half (56.1%) holding university level degrees. Most participants (76.2%) were non-problem gamblers as measured by the *Problem Gambling Severity Index* (PGSI) (Ferris & Wynne, 2001). Median completion time was 33 min 9 s.

Materials

Vignettes.

Two vignettes were used from previous studies (Hing et al., 2015; Horch & Hodgins, 2008). Based on DSM-5 criteria, one depicted a man who with gambling disorder and the other, alcohol use disorder, featuring the most common symptoms, without appearing overly stereotypical (American Psychiatric Association 2013). Results from the alcohol vignette are not reported further.

Measures.

Participants responded to questions about the vignette protagonist using the following measures, in line with Hing and colleagues' (2015). For multi-item scales, Cronbach's alphas are reported for pre-intervention values. Measures included perceived dimensions of stigmatised conditions (concealability, disruptiveness, recoverability, peril to others, peril to self, origins), emotional reactions to people with stigmatised conditions (pity, fear, anger) and processes of stigma creation (labelling, stereotyping, status loss and discrimination, social distancing).

Concealability was measured through a single item that asked how noticeable the protagonists situation would be to family and friends without being told about it. Responses were anchored at not at all noticeable (0) and extremely noticeable (4).

Disruptiveness was measured using three questions from the *Key Informants Questionnaire* ($\alpha = .71$) (Wig et al. 1980); anchored at not at all (0) and an extreme amount (4). Participants rated whether they thought the protagonist's situation would affect the ability to work/study, live independently and be in a serious relationship.

Recoverability was measured with a single item that asked how strongly participants felt the protagonist could recover. Responses were anchored at strongly disagree (0) and strongly agree (4).

Peril (to other) was measured using the *Perceived Dangerousness Item (Horch and Hodgins 2008; Link et al. 1999)* which asked how likely the protagonist would be violent towards others. *Peril (to self)* was measured by asking the likelihood that the protagonist would do something violent to himself. Both items were anchored at very unlikely (0) and very likely (4).

Origin was measured using the *Perceived Causes Scale (Link et al. 1999)*, which measured the likelihood of six potential condition origins. Responses were anchored at very unlikely (0) and very likely (4). The causes included; bad character, God's will, a chemical imbalance, genetics, the way the protagonist was raised and stressful life circumstances.

Emotional reactions were measured through nine questions, with three items corresponding to each of the key emotions: *pity* (need to help, sorry for, sympathy), *fear* (uncomfortable, apprehensive, scared) and *anger* (angry, annoyed, disgusted). Responses were anchored at strongly disagree (0) and strongly agree (4). Cronbach's alpha for each subscale ranged between .78 and .81.

Labelling was measured using five different labels that might be applied including; mental health disorder, physical health disorder, addiction, disease/illness, and diagnosable condition. Response options were no (0), unsure (1), and yes (2).

Stereotyping was measured using a 7-point semantic differential scale (α = .91) that included ten common stereotypes associated with gambling problems drawn from Horch and Hodgins (2013). Participants judged the protagonist's character (scored 0-6) between antonyms such as responsible - irresponsible, and, normal - deviant, with higher scores indicating endorsement of negative attributes.

Status loss and discrimination was measured using a 12-item scale (α = .84) adapted from the *Perceived Devaluation Discrimination Scale* (Link 1987). To reduce social desirability bias, participants indicated how much others would endorse discriminating thoughts and behaviours. Responses were anchored at strongly disagree (0) and strongly agree (4).

Social distance was measured using the 6-item *Social Distance Scale* (α = .87) *(Horch and Hodgins 2008; Martin et al. 2000)* which asked about the willingness of participants to engage with the protagonist. Responses were anchored at definitely unwilling (0) and definitely willing (4).

The concealability and social distancing scale labels were reverse scored for ease of interpretation as higher scores on these meant *less* of the attribute (e.g., higher concealability scores indicated a condition was *less* concealable or *more* noticeable). Consequently, higher scores on all scales indicate more of the labelled attribute.

The following variables were measured as potential covariates: exposure to gambling (*Level of Contact Report* [(Holmes et al. 1999) demographics (age, gender, highest education level attained, and language spoken at home), gambling involvement (Horch and Hodgins' [2008] *Involvement in Gambling Checklist*), and gambling risk (*PGSI*, Ferris & Wynne, 2001). Preliminary analyses found that they did not alter results and are, therefore, not reported further.

Finally, participants rated the credibility of the intervention from not believable at all (0) to completely believable (100). This video appraisal question was used previously to appraise stigma interventions (Roberts and Aida Farhana 2010).

Interventions.

Interventions merged video content from multiple publicly available sources. All interventions shared similarities in form and content. Each seven-minute intervention conveyed views and experiences from many people to minimise potential change due to characteristics of those featured. Specifically, for the contact intervention, this aimed to reduce stereotyping by showing multiple people not matching negative stereotypes (Corrigan et al., 2012) and maximise the likelihood that participants could relate to some individuals featured (Kay Bartholomew Eldredge et al. 2016). For the education and advocacy interventions, this was so information was not seen as one person's view. Similar information was included within the constraints of each intervention style so the style of presentation rather than the information presented was responsible for differences in results. See Table 1 for a list of the aspects of stigma addressed in each intervention. None of the interventions specifically addressed origins of bad character, status loss and discrimination, social distancing, or directly attempted to reduce fear.

TABLE 1 ABOUT HERE PLEASE

The contact intervention depicted 16 people who had experienced gambling difficulties which highlighted the heterogeneity of gambling disorder (*stereotyping*). Three appeared multiple times to develop their stories. Individuals had mostly recovered, although some were in the early stages of treatment (*recoverability*). The primary importance of winning was to recoup losses to keep the "addiction" hidden (*stereotyping/concealability/labelling - addiction*). The *origin of stress* was indicated through reference to the soothing, dissociative effect of EGMs, and that gambling urges were stronger at stressful times. The shame, guilt, loneliness and distress that resulted from gambling aimed to elicit *pity*. Reduced work performance, the potential for relationship breakdown, the preoccupation with gambling, and the potential for crime and imprisonment indicated *disruptiveness*. Desperation that could lead to criminal acts, imprisonment or self-harm informed *peril to self/others*.

The education intervention presented the chemical basis of behavioural addictions (*origin - chemical imbalance/labelling - addiction*) which is one of several interpretations of gambling-related problems ranging from personality factors to intergenerational transmission of at-risk gambling behaviour (Brunborg et al. 2016; Dowling et al. 2017). The chemical basis included its shared qualities of withdrawal symptoms and unsuccessful attempts to stop, but that people could recover (*recoverability/labelling - diagnosable*). *Stereotyping* was addressed with statements that indicated that people with gambling disorder typically have had successful lives and were rational and reasonable; their gambling did not come from a lack of knowledge and winning was often

not the desired outcome, countering the unintelligent and greedy 'problem gambler' stereotype. To reduce perceived difference (National Academies of Sciences, Engineering, and Medicine 2016), the intervention conveyed that recreational gambling could lead to playing longer and spending more than intended, especially on EGMs which could help people escape feelings of loneliness, boredom, personal losses, depression, and trauma (*origin - stress/pity*). The loneliness, guilt and shame felt by gamblers experiencing problems was also conveyed (*pity*). The strong preoccupation with gambling, large stretches of time spent gambling, and potential loss of homes indicated elements of *disruptiveness*. The difficulty admitting to gambling problems, keeping gambling problems secret, and the shock experienced by families on discovery of the condition addressed *concealability*.

The advocacy intervention stated that responsible gambling messages were a public relations campaign that placed responsibility on the consumer rather than the products and operators. The intervention aimed to redirect responsibility by explaining EGM design; the return percentage, rapid play, music, losses disguised as wins and the almost constant reinforcement, as even the illusion of winning releases dopamine (*stereotyping, origin - chemical imbalance/labelling - addiction*). Those experiencing gambling problems were positioned as victims of an uncaring industry that made substantial profits from them and aimed to drain players of all their funds (redirecting *anger/pity*). This position was supported by information about the disproportionate clustering of EGMs in disadvantaged areas (*origin - stress*), and the extensive lobbying employed by the gambling industry. The intervention addressed the state governments' conflict of interest (the substantial revenue received from gambling taxes), and the federal government's failure to maintain harm minimisation strategies (redirecting *anger*). Likening EGMs to the "crack cocaine of gambling" (van Wormer and Davis 2008), the intervention confirmed that gambling was a real, clinical addiction (*labelling - addiction/diagnosable*) with related stress, depression and high rates of suicide (*peril to self/pity*). Those with gambling problems were referred to as "social wreckage" alluding to *disruptiveness*.

The control video featured an interview followed by a short murder-mystery scene. It was the same length as the interventions, interesting, but unrelated to gambling or alcohol.

Procedure

Following ethics approval by [anonymised for review] Human Research Ethics Committee and a pilot test, the survey was launched. Participants were provided information about the study including the anonymity of their responses and voluntary consent. Participants reported their age and the country in which they lived, to determine eligibility. Eligible participants then completed initial questions assessing general exposure to

gambling. Participants were presented with the gambling or alcohol vignette (counterbalanced), rated the protagonist on the stigma measures, then saw the other vignette and again rated the protagonist on the stigma measures. Participants were randomly allocated to one intervention video, and rated it in terms of perceived credibility. To maximise the likelihood of watching the video, participants could not proceed until the video was complete. After the video, participants answered the same measures of stigma each vignette. Final questions asked for demographics and personal gambling behaviours including general participation and risk of gambling problems.

Data Analysis

As no effects based on the order of vignette presentation were found for the gambling vignette, analysis was conducted based on the before and after scores and change scores of the four videos - contact, education, advocacy and control. Age, gender, education level, gambling risk and gambling involvement were considered as covariates in analyses, but were not statistically significant. Univariate outliers were found; the data included 5-point scales and many participants on each variable showed little change. Analyses using parametric repeated measures *t*-tests and non-parametric Wilcoxon signed rank test resulted in little difference. Consequently, bias-corrected and accelerated bootstrapped repeated measures *t*-tests and between subject ANOVAs with Welch adjustment and Games-Howell *post-hoc* testing were conducted (Field 2017) using SPSS version 24.

Results

Repeated measures *t*-tests, comparing before and after ratings, determined which interventions were associated with changes for each stigma measure for the gambling vignette. See Table 2 for before and after scores including standard deviations.

TABLE 2 ABOUT HERE PLEASE

Dimensions.

The contact intervention significantly decreased the perceived *concealability* of gambling disorder, $t(45) = -2.79$, $p = .012$, $d = -0.41$, in contrast to the control, where perceived concealability of gambling disorder increased following the video, $t(41) = 3.97$, $p = .001$, $d = 0.61$. No significant changes were observed for any other intervention.

Perceived *disruptiveness* of gambling disorder increased in the contact intervention, $t(45) = 5.10$, $p = .001$, $d = 0.75$, but decreased in the control video, $t(41) = -5.11$, $p = .001$, $d = -0.79$, with no significant differences for the other interventions.

Peril to others in the contact condition significantly increased following the intervention, $t(45) = 2.72$, $p = .011$, $d = 0.40$, indicating that participants perceived gamblers to be more dangerous to others after the intervention. There were no significant changes for *peril to self*.

Recoverability scores only changed significantly following the advocacy intervention, $t(34) = -4.15$, $p = .003$, $d = -.70$, indicating that gambling disorder was perceived as being less recoverable after the intervention.

For *origins*, only *bad character* and *stressful life circumstances* showed significant results. Only in the advocacy intervention did scores significantly decrease for bad character following the intervention, $t(34) = -2.92$, $p = .026$, $d = -0.49$, indicating that this was less endorsed as an origin. The contact intervention significantly increased the perception that gambling disorder originated from stressful life circumstances, $t(45) = 4.70$, $p = .001$, $d = 0.69$.

Emotional reactions.

For the contact intervention only, *pity* scores significantly increased, $t(45) = 3.82$, $p = .005$, $d = 0.56$, while *fear* scores were significantly reduced, $t(45) = -2.08$, $p = .039$, $d = -0.31$. *Anger* scores significantly reduced for both the education, $t(40) = -2.45$, $p = .027$, $d = -0.38$, and advocacy interventions, $t(34) = -2.92$, $p = .005$, $d = -0.49$.

Processes.

Both the contact and education interventions increased some aspects of *labelling*. Both contact and education interventions increased the likelihood of gambling disorder being labelled a *physical health disorder*, $t(45) = 2.93$, $p = .007$, $d = 0.43$ and $t(40) = 3.97$, $p = .002$, $d = 0.62$ respectively, and a *disease or illness*, $t(45) = 3.60$, $p = .005$, $d = 0.53$ and $t(40) = 2.50$, $p = .016$, $d = 0.39$ respectively. In addition, the education intervention increased the likelihood of gambling disorder being labelled a *mental health disorder*, $t(40) = 2.22$, $p = .044$, $d = 0.35$ and a *diagnosable condition*, $t(40) = 2.72$, $p = .036$, $d = 0.42$.

Stereotyping significantly reduced for the education intervention only, $t(40) = -2.42$, $p = .021$, $d = -0.38$, indicating reduced willingness to endorse stereotypes associated with 'problem gambling' following the intervention.

Status loss and discrimination significantly decreased for the advocacy intervention only, $t(34) = -2.13$, $p = .044$., $d = -0.36$, indicating reduced belief that discrimination would occur should the public view the intervention.

Social distance scores changed in the contact intervention only. Scores significantly increased after the intervention, $t(45) = 2.31$, $p = .028$, $d = 0.34$, indicating that participants desired greater social distance following the intervention.

Change comparisons between interventions

One way between-subjects ANOVAs were used to compare the interventions on the differences in change levels for each stigma measure for the gambling vignette. Omnibus results and differences between interventions denoted by superscripts can be seen in Table 3. Games-Howell *post-hoc* tests were used for pairwise comparisons.

TABLE 3 ABOUT HERE PLEASE

Dimensions.

Concealability change was significantly different between the control video and the contact ($p < .001$), education ($p = .038$) and advocacy ($p = .004$) interventions which were not different to each other. The control video significantly increased perceived *concealability*.

Disruptiveness change was significantly different between contact and the education ($p = .003$), advocacy ($p = .006$) and control ($p < .001$) videos, with contact increasing perceived *disruptiveness*. The control, which reduced perceived *disruptiveness*, also differed significantly from the education ($p = .021$) and advocacy ($p = .041$) interventions.

Change in *peril to others* was significantly different for the contact and advocacy interventions ($p = .022$), with contact increasing, and advocacy reducing, perceived peril to others. The education and control videos did not differ significantly from either group. While *peril to self* produced a significant omnibus result, the difference between the contact and control videos did not reach significance ($p = .062$).

Advocacy reduced the perceived *recoverability* significantly more than the contact ($p < .001$), education ($p = .005$) and control ($p = .009$) videos which changed little.

Contact increased the *origin of stress* significantly more than education ($p = .025$), advocacy ($p = .030$) and the control ($p = .004$) which were similar.

Processes.

For *stereotyping*, the education intervention was significantly different to contact ($p = .038$), with education reducing, and contact increasing, stereotyping. Advocacy and education were comparable in their reduction of stereotyping.

Labelling as a *mental disorder* significantly differed between the education and control videos (p = .034), with education increasing the use of this label. As a *physical disorder*, the education intervention increased the use of this label and differed significantly from advocacy (p = .049) and the control (p = .042) which showed a small reduction. The contact intervention showed similar increases to education. As a *disease or illness*, the contact intervention differed significantly from advocacy (p = .020), with contact increasing and advocacy showing a very small reduction in the endorsement of this label.

Credibility

There was no significant difference between credibility ratings of the gambling interventions, $F(2, 79.12) = 0.08$, p = .923. The interventions had comparable means; contact (M = 89.13, SD = 18.24), education (M = 89.76, SD = 13.51), advocacy (M = 88.57, SD = 12.16). Notably, credibility ratings for the contact intervention ranged between 20% and 100% credibility compared to education and advocacy which both ranged between 60% and 100%.

Discussion

The present study aimed to compare three interventions (contact, education, advocacy) to each other, and to a control, regarding their efficacy in reducing aspects of gambling-related stigma. Results indicated that all interventions were associated with changes in some stigma measures, and that, generally, different interventions were associated with change on different aspects of stigma, despite overlapping content between intervention styles.

The results highlight the complex nature of gambling-related stigma, and that interventions based on only one approach may not be optimal. Importantly, not all differences reduced stigma. Hence, carefully tailored interventions using methodologies that produce the best results on each aspect of stigma may generate the most positive change. Despite overlapping content, interventions were not equally effective. For example, while all measures addressed stressful origins and attempted to elicit pity, only contact significantly improved these aspects of stigma. Similarly, all interventions attempted to counter stereotyping, yet only education significantly reduced the endorsement of stereotypes. This suggests that the results are not solely due to the content of the interventions, but also the overall intervention styles. We must also consider that different styles emphasise different aspects of gambling-related problems and this may have also impacted on the results. For example, while the education intervention spoke about how the EGMs worked and explained the experiences of the gamblers which placed focus on those with problems, in the advocacy intervention, the machines were blamed for gambling problems and the responsibility attributed to the individual was diminished. Consequently, it is

necessary to determine the optimal combination of content, message and intervention style to effectively reduce stigma.

Relative Effectiveness of Each Intervention Type

Contact.

Contact produced nine changes, compared to six for education and four for advocacy; however, these changes was not always favourable. Previous research for other conditions has often found contact to be the most effective form of stigma reduction (Corrigan et al. 2012; Thornicroft et al. 2016), however, Cook and colleagues (2014) have noted a potential limitation; contact may be confronting. This seems possible with gambling disorder, so use of contact for stigma reduction may need careful consideration.

The emotional reactions to the contact intervention were favourable. *Pity* ratings increased indicating stigma reduction, possibly aided by the increased recognition of the role that *stress* played in gambling disorder. Highlighting the contribution of external factors likely meant the disorder was less attributed to personal failings (Horch & Hodgins, 2008). A caveat to increased pity, however, is that pity may negatively impact on the self-stigma of those with gambling disorder as it may disempower them and may be a sign of public condescension (Corrigan and Fong 2014). *Fear* ratings reduced despite not being addressed directly in the intervention in line with general principles of contact interventions in other studies (Thornicroft et al. 2016), yet the perceptions of *peril to others* and *disruptiveness* increased. This potentially indicated that participants gained new knowledge of the condition. Despite the reduction in fear, suggesting participants felt reassured, there was a significantly greater desire for *social distance* following the contact intervention indicating greater stigma overall.

The increase in *labelling* as a *physical condition* and a *disease* may have contributed to the increased desire for *social distance*, as labelling can separate the public from a stigmatised group. However, Scholl (2017) argues, labelling need not equate to stigmatisation and may, instead, indicate recognition that a condition is legitimate and treatable. Based on these preliminary results, using the contact style for stories of the stressful antecedents of gambling disorder may be useful but consequences may be better delivered through a style less likely to elicit strong emotional reactions. While not significant, the increase in *stereotyping,* despite the variety of individuals featured, may indicate that individuals became exceptions, thus, reconfirming the stereotype (Corrigan et al. 2012). This may explain credibility ratings as low as 20% for the contact intervention.

The contact intervention contrasted with the control on the dimensions of *concealability* and *disruptiveness* indicating a potential link between these aspects of stigma. The control increased the perception of concealability and reduced disruptiveness of gambling disorder which may indicate the issue was taken less

seriously. Consequently, the increased disruptiveness observed in the contact intervention may reflect the condition was assessed as more serious. The seriousness of the disorder may stimulate the need to help, and increase sympathy and support for government initiatives to address gambling problems (Kay Bartholomew Eldredge et al., 2016). Contact's significantly increased *pity* ratings may support this interpretation. Regarding concealability, participants may have believed that the circumstances described in the contact intervention would be easily recognised, perhaps due to the candid stories conveyed. This may inadvertently increase the perceived rarity of the condition, increasing stigma, but requires further exploration.

Education.

The education intervention increased *labelling* of gambling disorder (*mental disorder*, *physical disorder*, *disease* and *diagnosable*). While labelling can emphasise differences between the public and the stigmatised group (Kvaale et al. 2013), importantly, the desire for *social distance* did not significantly increase which may indicate that labelling reflected a different understanding of the condition (Jorm and Griffiths 2008). The reduction in *anger*, especially considering that the intervention did not directly attempt to minimise this emotion, also suggests that labelling may have led to the perception that problem was less within the individual's control, reducing the personal responsibility often attributed to gambling disorder (Kvaale et al. 2013).

Education was the only intervention to significantly reduce *stereotyping* for gambling disorder, which has been shown in research for other conditions (National Academies of Sciences, Engineering, and Medicine 2016). The advantage of the educational style is that it could potentially convey more confronting information about the disorder in a neutral manner without any significantly negative impact on stigma.

Advocacy.

Advocacy had beneficial effects on important aspects of stigma. The ability to reduce the *origins of bad character* is particularly important considering the level of personal responsibility typically attributed to gambling disorder. This reduction highlights the potential need to shift the onus of responsibility back towards industry and government (Livingstone and Woolley 2007; Thomas et al. 2016). This awareness may also have led to the reduction in *anger* following this intervention as the anger previously directed primarily at the currently targeted 'problem gambler' may have dispersed across the presented industry and governmental groups. Despite portraying those experiencing gambling problems as victims, there was no significant increase in *pity*, perhaps due to the underlying message that gambling problems could happen to anyone, also evident in the education intervention, which minimises the differences between the public and the stigmatised group

(Corrigan and Fong 2014). Using advocacy in conjunction with contact, to generate pity and reduce fear, may effectively elicit a powerful change of emotional responses to reduce stigma, particularly if it also cultivates feelings of empathy (Corrigan and Fong 2014). Often advocacy methods use members of stigmatised groups to convey its stigma reduction messages (National Academies of Sciences, Engineering, and Medicine 2016). Further investigation would be required before these elements could be combined to this extent as contact yielded mixed results.

The advocacy intervention also significantly decreased the perception of *recoverability*. While recoverability was not directly addressed, the advocacy style may have led to pessimism, especially with the reference to the high suicide rate associated with gambling disorder. If considered untreatable, potential anger toward those who do not seek treatment may diminish, thereby reducing stigma (McGinty et al. 2015). However, suggesting that gambling disorder is a lifetime condition (Rash and Petry 2014) may lead to relapse fears and stigmatisation well after recovery (Cunningham et al. 2011; Kreek 2011; Kvaale et al. 2013). Importantly, should the condition be viewed as irrecoverable, this could further reduce the likelihood of seeking help (Gartner et al. 2012; Kvaale et al. 2013). The precise meaning of recoverability for gambling-related stigma should be further explored and advocacy, for this dimension, may need to emphasise the condition's recoverability to encourage help-seeking behaviour.

The advocacy intervention significantly reduced perceived *status loss and discrimination*. Discrimination was not directly addressed by any of the intervention styles, yet advocacy showed a different pattern of change in discrimination scores to the other interventions. Behavioural intentions are typically more difficult to change (Corrigan et al. 2012; Winkler et al. 2017) so the potential for advocacy to reduce discrimination could be further explored.

Implications and Future Directions

The complex nature of gambling-related stigma is highlighted through findings that the different interventions worked on different aspects of stigma despite overlapping content (Hing et al. 2015; Konkolÿ Thege et al. 2015). This may stem from the nature of the methodologies and the potentially different emphases that the intervention styles deliver. Nevertheless, it suggests that a carefully selected multi-pronged approach may be required to comprehensively address stigma as relying on a single intervention style may be detrimental; not all aspects of stigma would be addressed and some may be worsened. This study has given some preliminary indications of which elements may be effective and provides an avenue for future research.

The results from this study are promising. They showed that relatively short interventions, only 7 minutes in length, were effective at reducing aspects of stigma with an immediate effect. Whether these changes are maintained long term is a topic for subsequent exploration, as is with whom the interventions are most effective.

Limitations.

This study's online recruitment may have restricted the range of participants. The vignettes used only depicted men which may have influenced reactions to the contact intervention in this study which featured both genders, as females attract greater stigma (Baxter et al. 2016). While this emphasised the variety of people affected by gambling disorder, future studies could consider interventions with different combinations of genders to determine whether the gender shown impacts on stigma reduction.

Additionally, while intervention content was similar, they were limited by public availability of material and the necessary methodological restrictions. For example, advocacy elements were removed from other interventions and personal experiences that could have vividly illustrated points were removed from non-contact interventions. Nevertheless, several aspects of stigma were addressed across all interventions, yet significant differences often appeared for only one style, suggesting that intervention style was instrumental in changes. These findings are preliminary and need further validation, as different content may yield different results. Future studies should also be mindful that attempts to garner pity to reduce public stigma should be empathic by minimising differences between the public and the stigmatised group so as to avoid condescension that pity alone may produce (Corrigan and Fong 2014).

The repeated measures design may have introduced expectancy effects. Participants may have conformed, or intentionally attempted to keep answers to the repeated stigma measures the same. Nevertheless, this design minimised the individual differences that may have otherwise affect results which was important considering the relatively small convenience sample available for the study.

Despite these limitations, this was the first study to experimentally examine how different types of interventions alter gambling-related stigma. Being experimental, the evidence is more compelling and the diverse backgrounds of participants in terms of education level and age may indicate that attitudes and subsequent change may be more typical than if participants were restricted to a particular demographic.

Conclusion

This study suggests contact, education and advocacy approaches can effectively reduce different aspects of stigma. Hence, combining successful elements from each intervention style may be optimal in

combating public stigma towards those with gambling disorders. Contact can be used to elicit pity and reduce fear, highlighting the stressful circumstances associated with the development of the disorder, while education and particularly advocacy can be used to reduce anger. Education interventions can break down some of the strong stereotypes associated with gambling by minimising the differences between the general public and those with gambling disorder, and can also create an awareness of the more confronting information related to the usually hidden disorder in a neutral manner thereby minimising potentially negative reactions. As reducing public stigma is intended as a means of increasing problem recognition and help-seeking behaviour among those with gambling disorder, ultimately the message needs to be that treatments are available and it is possible to recover. Hence, advocacy needs to be further assessed, and the recoverability dimension, itself, further explored to determine its effect on gambling stigma specifically. Advocacy, however, could help reduce the blame associated with gambling disorder which is a strong component associated with stigma for addictions. Certainly advocacy shows more potential for gambling disorder than it has in other mental health conditions and warrants further investigation.

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Table 1

Elements of stigma addressed by intervention type

	Contact	Education	Advocacy
Concealability	✓	✓	
Disruptiveness	✓	✓	✓
Peril - Other	✓		
- Self	✓		✓
Recoverability	✓	✓	
Origin - Chemical imbalance		✓	✓
- Stress	✓	✓	✓
Emotion - Pity	✓	✓	✓
- Anger			✓
Labelling - Addiction	✓	✓	✓
- Diagnosable		✓	✓
Stereotype	✓	✓	✓

Table 2

Mean (and SD) before and after scores for each gambling stigma dimension by intervention

	Contact		Education		Advocacy		Control	
	Before	After	Before	After	Before	After	Before	After
Concealability	2.59	2.13*	2.46	2.44	2.40	2.31	2.36	2.98**
	(1.18)	(1.29)	(1.05)	(0.95)	(0.88)	(1.05)	(0.85)	(0.90)
Disruptiveness	7.04	8.28**	7.39	7.24	7.49	7.31	7.33	6.02**
	(2.78)	(2.63)	(2.19)	(2.71)	(2.33)	(2.41)	(1.93)	(2.09)
Peril								
Other	1.33	1.72*	1.22	1.44	1.54	1.37	1.36	1.31
	(1.14)	(1.07)	(1.01)	(1.03)	(0.92)	(0.94)	(1.06)	(0.87)
Self	1.87	2.20	2.00	2.10	2.40	2.66	2.00	1.81
	(1.17)	(1.15)	(1.10)	(1.11)	(1.01)	(1.16)	(1.06)	(1.13)
Recoverability	3.13	3.29	3.00	3.12	3.26	2.69**	3.29	3.29
	(0.83)	(0.71)	(1.05)	(1.00)	(0.66)	(1.05)	(0.71)	(0.64)
Origin								
Bad character	0.91	0.76	0.85	0.73	0.89	0.69*	0.95	0.95
	(1.07)	(0.87)	(0.79)	(0.78)	(0.83)	(0.76)	(0.99)	(0.94)
God's will	0.22	0.17	0.22	0.20	0.17	0.17	0.57	0.48
	(0.55)	(0.44)	(0.52)	(0.46)	(0.57)	(0.51)	(1.06)	(0.92)
Chemical imbalance	2.26	2.37	2.34	2.46	2.57	2.49	2.48	2.43
	(1.08)	(1.10)	(1.06)	(1.03)	(0.85)	(0.98)	(0.86)	(0.99)
Genetics	1.93	1.96	2.24	2.34	2.49	2.43	2.17	2.36
	(1.08)	(1.13)	(1.16)	(0.96)	(0.85)	(1.04)	(0.96)	(0.98)
Raised	2.26	2.11	2.15	2.12	2.60	2.34	2.36	2.43
	(1.00)	(1.08)	(1.09)	(1.10)	(0.91)	(1.11)	(0.88)	(1.09)
Stress	2.93	3.41**	3.20	3.29	3.14	3.23	3.10	3.10
	(0.74)	(0.72)	(0.71)	(0.81)	(0.49)	(0.55)	(0.79)	(0.69)
Emotion								
Pity	7.61	8.26**	8.34	8.76	8.49	8.74	7.76	7.83
	(2.79)	(2.44)	(2.53)	(2.39)	(1.58)	(1.82)	(1.91)	(2.40)
Fear	4.80	4.33*	4.32	4.00	4.60	4.03	4.29	3.93
	(2.24)	(2.39)	(2.70)	(2.59)	(2.16)	(2.24)	(2.42)	(2.16)
Anger	4.83	4.65	5.07	4.44*	4.91	4.20**	4.12	4.10
	(2.64)	(2.57)	(2.71)	(2.78)	(2.16)	(2.19)	(2.14)	(2.45)
Labelling								
Mental disorder	1.35	1.50	1.39	1.66*	1.63	1.57	1.64	1.55
	(0.77)	(0.72)	(0.77)	(0.57)	(0.55)	(0.65)	(0.53)	(0.71)
Physical disorder	0.33	0.61**	0.34	0.78**	0.57	0.66	0.48	0.55
	(0.47)	(0.61)	(0.48)	(0.69)	(0.65)	(0.73)	(0.63)	(0.71)
Addiction	1.91	1.91	2.00	2.00	1.97	1.91	1.98	1.98
	(0.35)	(0.41)	(0.00)	(0.00)	(0.17)	(0.37)	(0.15)	(0.15)
Disease	0.96	1.22**	1.02	1.32*	1.51	1.49	1.24	1.31
	(0.79)	(0.76)	(0.88)	(0.79)	(0.66)	(0.66)	(0.85)	(0.78)
Diagnosable	1.70	1.78	1.63	1.83*	1.66	1.63	1.64	1.67
	(0.55)	(0.51)	(0.62)	(0.38)	(0.54)	(0.60)	(0.62)	(0.53)
Stereotype	39.02	40.41	37.76	35.05*	38.37	36.86	37.05	37.60
	(10.18)	(9.37)	(12.63)	(11.88)	(9.20)	(8.82)	(9.20)	(8.32)
Status loss/ Discrimination	25.80	25.48	25.78	24.88	29.14	26.43*	27.55	26.88
	(7.15)	(7.34)	(8.10)	(8.51)	(5.45)	(6.19)	(6.83)	(7.38)
Social Distance	10.89	11.87*	10.02	10.39	11.77	11.37	9.93	10.45

	(4.77)	(5.14)	(4.79)	(5.42)	(4.50)	(5.75)	(5.70)	(5.22)

Note: * $p < .05$, ** $p < .01$, *** $p < .001$ on after scores are based on per-intervention repeated measures *t*-tests.

Table 3

Change Scores (with bootstrapped 95% confidence interval) for each stigma measure for the gambling vignette, by intervention type

	Change Scores				Welch F
	Contact	Education	Advocacy	Control	(df = 3)
Concealability	-0.46*[a] [-0.77, -0.17]	0.02[a] [-0.30, 0.29]	0.09[a] [-0.33, 0.16]	0.62**[b] [0.33, 0.93]	7.88***
Disruptiveness	1.24**[a] [0.77, 1.74]	-0.15[b] [-0.72, 0.41]	-0.17[b] [-0.86, 0.44]	-1.31**[c] [-1.79, -0.86]	17.24***
Peril					
Other	0.39*[a] [0.11, 0.67]	0.22[ab] [0.05, 0.41]	-0.17[b] [-0.39, 0.06]	-0.05[ab] [-0.24, 0.14]	3.84*
Self	0.33 [0.02, 0.61]	0.10 [-0.07, 0.29]	0.26 [0.00, 0.50]	-0.19 [-0.45, 0.02]	2.86*
Recoverability	0.17[a] [0.00, 0.37]	0.12[a] [-0.10, 0.37]	-0.57**[b] [-0.86, -0.31]	0.00[a] [-0.19, 0.17]	6.83***
Origin					
Bad Character	-0.15 [-0.35, 0.02]	-0.12 [-0.29, 0.07]	-0.20* [-0.34, -0.06]	0.00 [-0.21, 0.24]	0.65
God's will	-0.04 [-0.20, 0.09]	-0.02 [-0.17, 0.11]	0.00 [-0.09, 0.09]	-0.10 [-0.36, 0.12]	0.23
Chemical	0.11 [-0.15, 0.33]	0.12 [-0.07, 0.34]	-0.09 [-0.45, 0.24]	-0.05 [-0.26, 0.19]	0.63
Genetics	0.02 [-0.22, 0.26]	0.10 [-0.10, 0.32]	-0.06 [-0.44, 0.27]	0.19 [0.05, 0.36]	0.62
Raised	-0.15 [-0.35, 0.04]	-0.02 [-0.32, 0.29]	-0.26 [-0.54, 0.03]	0.07 [-0.24, 0.36]	1.06
Origin (cont.)					
Stress	0.48**[a] [0.30, 0.67]	0.10[b] [-0.05, 0.24]	0.09[b] [-0.08, 0.24]	0.00[b] [-0.14, 0.17]	4.60**
Emotions					
Pity	0.65** [0.35, 1.0]	0.41 [0.02, 0.80]	0.26 [-0.03, 0.56]	0.07 [-0.49, 0.60]	1.41
Fear	-0.48* [-0.91, -0.02]	-0.32 [-0.77, 0.24]	-0.57 [-1.33, 0.03]	-0.36 [-0.86, 0.07]	0.16
Anger	-0.17 [-0.63, 0.30]	-0.63* [-1.09, -0.16]	-0.71** [-1.17, 0.31]	-0.02 [-0.60, 0.50]	1.69
Labelling					
Mental disorder	0.15[ab] [0.00, 0.30]	0.27*[a] [0.07, 0.46]	-0.06[ab] [-0.31, 0.16]	-0.10[b] [-0.19, -0.02]	4.03*
Physical disorder	0.28**[ab] [0.13, 0.46]	0.44**[a] [0.27, 0.63]	0.09[b] [-0.06, 0.25]	0.07[b] [-0.05, 0.21]	3.30*

Addiction	0.00 [-0.07, 0.07]	#	-0.06 [-0.23, -0.05]	#	#
Disease	0.26**[a] [0.15, 0.39]	0.29*[ab] [0.07, 0.51]	-0.03[b] [-0.15, 0.09]	0.07[ab] [-0.05, 0.17]	3.83*
Diagnosable	0.09 [-0.04, 0.22]	0.20* [0.10, 0.32]	-0.03 [-0.26, 0.17]	0.02 [-0.07, 0.12]	1.40
Stereotype	1.39[a] [-0.66, 3.60]	-2.71*[b] [-4.85, -0.78]	-1.51[ab] [-3.11, 0.12]	0.55[ab] [-0.90, 2.14]	3.35*
Status Loss/ Discrimination	-0.33 [-1.46, 0.85]	-0.90 [-2.12, 0.44]	-2.71* [-5.06, -0.48]	-0.67 [-1.88, 0.55]	0.94
Social Distance	0.98* [0.13, 1.85]	0.37 [-0.31, 0.98]	-0.40 [-1.20, 0.40]	0.52 [-0.19, 1.29]	1.96

Note: * p < .05, ** p < .01, *** p < .001, for interventions, are based on per-intervention repeated measures *t*-tests. Superscripts identify significant differences *between* interventions for that stigma measure. Interventions with the same superscript do not differ significantly, and interventions with multiple superscripts do not differ significantly from any other group with any of the same superscripts. Change scores calculated as after-before, so negative numbers indicate a decrease for that measure.

No change was observed for these conditions; thus, the calculated change scores were constant and analyses could not be conducted.