Journal of the International Neuropsychological Society (2010), **16**, 705–710.

doi:10.1017/S1355617710000524

Community attitudes toward individuals with traumatic brain injury

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(RECEIVED January 11, 2010; FINAL REVISION April 16, 2010; ACCEPTED April 16, 2010)

Abstract

Explicit and implicit attitudes toward people who have sustained traumatic brain injury (TBI) were investigated to determine if negative attitudes exist and if the terminology used (brain *vs.* head injury) exacerbated predicted negativity. Participants (n = 103) rated Tony (brain/head injury) and Peter (limb-injury) on 10 characteristics using a 7-point scale. Familiarity with brain injury was also measured. Implicit Association Tests (IAT) assessed potential negative bias. Tony (M = 36.84) was judged more negatively than Peter (M = 31.69). The term "brain" versus "head" injury resulted in more negative evaluations (Ms = 38.72 *vs.* 34.78). Participants familiar with TBI were more positive toward Tony than those unfamiliar (Ms = 34.98 *vs.* 39.80). Only those unfamiliar with TBI demonstrated implicit negative bias. Negative attitudes toward TBI are expressed explicitly with individuals openly endorsing less desirable characteristics. When people have more knowledge about or experience with brain injury, they are less likely to endorse negative stereotypes. (*JINS*, 2010, *16*, 705–710.)

Keywords: TBI, Head injury, Brain injuries, Public attitudes, Stigmatization, Stereotype, Social Discrimination

INTRODUCTION

Traumatic brain injury (TBI) is one of the leading causes of disability and death (Babinkian & Asarnow, 2009; McKinlay et al., 2008). Approximately 1.5 million people in America sustain a TBI each year and nearly 100,000 of these patients have permanent physical, cognitive, and or behavioral disabilities (Resch, Villarreal, Johnson, Elliott, & Kwok, 2009).Young children are particularly vulnerable to the injury event itself and to ongoing problems (Hessen, Nestvold, & Anderson, 2007; McKinlay, Dalrymple-Alford, Horwood, & Fergusson, 2002; McKinlay, Grace, Horwood, Fergusson, & MacFarlane, 2009). The heterogeneity and complexity of the impairments and injury itself compound the difficulties that patients experience (Maas, Stocchetti, & Bullock, 2008); however, little is known about how the general public perceive individuals who have experienced a TBI. We know that the public hold less positive views than psychology students (Linden & Crothers, 2006), but a wider understanding of public perception is important as societal attitudes will have an impact on the success of any rehabilitation programs and efforts to maximize positive life outcomes for those who have experienced a TBI event.

The public have previously demonstrated many misconceptions about TBI sequelae. Common inaccuracies include that an individual can be left with severe memory deficits while all other functions remain intact and that a complete recovery from severe injury is possible (Hux, Schram, & Goeken, 2006). These misconceptions together with the problems that often do accompany TBI events mean individuals who experience TBI may be subjected to negative attitudes within the community which likely lead to less life opportunities, increased stress, and worse health outcomes (Link & Phelan, 2006). Certainly increases in patient adjustment and well-being predict better TBI outcomes (Resch et al., 2009), as does higher personal self-efficacy, the presence of employment opportunities, and a supportive social environment (Resch et al., 2009).

Adding to the potential for misinformation about TBI and hence stigma is research showing the use of the term "brain injury" compared with "head injury" results in higher endorsement of the term "negative" as a concept associated with TBI events (McKinlay, Bishop, & McLellan, Under review). It is unknown whether the difference in terminology will also result in more negative evaluations of a person who has been described as sustaining a brain injury compared

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with head injury. Familiarity is also likely to influence evaluations made of people who have experienced a TBI event. People who are familiar with mental illness, for instance, regard individuals with schizophrenia or major depression as less dangerous than those who are not familiar (Wolkenstein & Meyer, 2009). Whether familiarity with TBI influences attitudes remains unclear.

A recent methodological review on attitude measurement recommended the use of explicit self-report and implicit measures jointly as predictors of behavior (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Implicit measures are largely involuntary and can reveal negative attitudes toward people who have suffered TBI when these are not explicitly endorsed (Greenwald, McGhee, & Schwartz, 1998) due to social desirability bias. Explicit and implicit attitudes, although often related, are different. Evaluations that people arrive at after thoughtful deliberation can be different to the more automatic judgments that likely influence many social encounters and explicit and implicit biases can differentially predict discriminatory behaviors (Bessenoff & Sherman, 2000). It is important to measure both for a fuller understanding of community attitudes toward people with TBI. Well-established response-time tasks like the Implicit Association Test (IAT; Greenwald et al., 1998) index implicit attitudes and have been widely used to investigate negative attitudes associated with mental illness (Teachman, Wilson, & Komarovskaya, 2006), for instance.

This research aims to investigate explicit and implicit attitudes toward TBI to determine if negative attitudes against people with such injuries occur in the community. To investigate attitudes un-confounded by issues regarding perceived culpability, we intend to posit the research question with regard to a young adult who was injured as a "blameless child." It is predicted that individuals with brain/head injuries will be evaluated more negatively than individuals who sustained body/limb injuries in the same type of accident and further that the use of the term "brain injury" compared with "head injury" will magnify this effect.

METHOD

This study received ethics approval from the University of Canterbury Human Ethics Committee. All data were obtained in compliance with the regulations of the Human Ethics Committee, University of Canterbury. All participants were informed about the nature of the study and participation was voluntary. Inclusion criterion was the ability to read English.

Participants

Participants were a convenience sample, recruited through various workplaces around the Canterbury region of Christchurch, New Zealand. One hundred three members of the public agreed to participate. The mean age was 36 years (SD = 12.93; range = 17–67 years), and 57% were female.

Materials

Explicit Measure

Participants completed a self-report questionnaire where they rated Tony (brain/head injury) and Peter (limb injury) on 10 characteristics (sociable/unsociable; friendly/distant; mature/immature; intelligent/stupid; flexible/rigid; polite/rude; likeable/unlikeable; trustworthy/suspicious; honest/deceptive; employable/unemployable) using a 7-point scale (see Appendix). Both men were depicted as 25 years old and had a car accident when they were 10 years old resulting in either a brain/head injury or limb injury, respectively. Each participant was also asked to indicate whether they or someone they knew had previously experienced a brain/head injury or not. These items established if each participant was personally familiar with TBI, familiar with TBI by knowing someone, or had no experience of either. There were two versions of the questionnaire (A and B): Version A used the term, brain injury, whereas Version B used head injury.

Implicit Measures

A seven block computerized version of the IAT (Greenwald et al., 1998) was used to assess automatic associations to brain/head injury relative to body (limb) injury. The IAT has been widely used to assess implicit attitudes, including attitudes toward people with illness or disability (Teachman et al., 2006). The IAT measures relative strength of associations between categories and attribute dimensions. The test is based on the principle that, when closely associated concepts share the same response key (congruent: e.g., life & good) the response is simpler and therefore faster than when less closely associated concepts share the same key (incongruent: e.g., life & bad). Response time (RT) is calculated and a relative difference score between congruent and incongruent blocks is taken as a measure of implicit attitudes between the two categories of interest. In the present study "Brain (Head) injury" and "Body injury" categories were used along with "Positive" and "Negative" attributes. The category stimuli were pictures of people experiencing a TBI (i.e., lying concussed on the sport field) and body injury (i.e., lying with a broken leg on the sport field) as well as words/terms including coma, seizure, knocked-out, concussion, lost consciousness, burns, broken back, fractured arm, dislocation, sprain. The attribute stimuli were the labels used to anchor the positive and negative characteristics in the explicit measure. The IAT effect was calculated for each participant using the revised algorithm recommended by Greenwald, Nosek, and Banaji (2003). A positive score indicates a stronger implicit association between brain/head injury and negative attributes than body injury and negative attributes. A negative score indicates that body injury rather than brain/head injury is more strongly associated with negative attributes. Regardless of direction, larger IAT scores indicate stronger implicit associations.

https://doi.org/10.1017/S1355617710000524 Published online by Cambridge University Press

Procedure

The purpose of the study was outlined to each participant. Each participant completed the limb injury rating and was randomly assigned to complete either the brain injury or head injury rating (explicit measure) and then one IAT (either brain injury *vs.* body injury or head injury *vs.* body injury). Participants were debriefed at the conclusion and offered a snack reward.

Statistics

To examine the effect of injury type (brain & head *vs.* limb) on explicit ratings of personal attributes we conducted a repeated measures analysis of variance (ANOVA). ANOVA was also used to examine the effects of terminology used to describe TBI (brain *vs.* head injury) on both explicit ratings (10 attribute ratings) and IAT scores. The effect of familiarity (familiar *vs.* not) on total explicit scores and IAT scores was also examined in separate ANOVAs. Effect sizes were represented by *d* whereby 0.1–0.3, 0.3–0.8, and > 0.8 represent small, medium, and large effects respectively.

RESULTS

Explicit Measure

Higher mean scores are indicative of more negative attitudes. As can be seen in Table 1, total scores show that Tony (brain/head injury) was judged more negatively across the 10 characteristics than was Peter (limb injury), $F(1,102) = 49.90$; $p < .001$. Within the total scores, *post hoc* tests (Tukey, $p < .05$) showed Tony was rated more negatively than Peter on every characteristic except likeability, trustworthiness, and honesty, with large effect sizes found for maturity and intelligence. Table 2 shows that participants who completed the "brain injury" questionnaire were more negative toward Tony than those who completed the "head injury" questionnaire $F(1,101) = 9.24$; $p < .01$,[1] and rated Tony more negatively on 6 of the 10 attributes (Tukey, $p < .05$).

Next, we wanted to see what effect familiarity with brain/head injuries had on the judgments of participants. Those who had experienced a brain/head injury or who knew someone who had (familiar),[2] were more positive ($M = 34.98$; $SD = 8.4$) toward Tony (brain/head injury) than those who had no such experience (unfamiliar, $M = 39.80$; $SD = 8.1$); $F(1,99) = 9.28$; $p < .01$; $d = .60$.

Table 1. Mean ratings of personal attributes as a function of injury type

	Type of injury		
	Brain/head injury (Tony) ($N = 103$) *M (SD)*	Limb injury (Peter) ($N = 103$) *M (SD)*	Effect size *(d)*
Sociable	3.84 (1.19)	3.19 (1.12)***	.58
Friendly	3.63 (1.26)	2.98 (1.11)***	.55
Mature	4.14 (1.24)	3.00 (1.04)***	1.00
Intelligent	3.95 (1.20)	3.03 (1.11)***	.80
Flexible	4.28 (1.17)	3.75 (1.24)***	.44
Polite	3.65 (1.17)	3.20 (1.07)**	.40
Employable	3.97 (1.35)	3.37 (1.28)***	.46
Likeable	3.15 (1.05)	3.04 (1.04)	.11
Trustworthy	3.27 (1.11)	3.07 (1.09)	.18
Honest	3.02 (1.13)	3.06 (1.10)	.04
Total	*36.85 (8.03)*	*31.69 (9.20)***	*.60*

Note. Ratings were made on 7-point Likert scale. Higher ratings indicate more negative judgments. Significant at **$p < .01$, ***$p < .001$.

Table 2. Mean ratings for Tony (brain/head injury) as a function of the terminology used to describe the injury

	Terminology used		
	Head injury (N=51) *M (SD)*	Brain injury (N=52) *M (SD)*	Effect size *(d)*
Sociable	3.73 (1.31)	3.94 (1.06)	.18
Friendly	3.55 (1.24)	3.71 (1.29)	.13
Mature	3.82 (1.32)	4.44 (1.07)*	.50
Intelligent	3.63 (1.11)	4.17 (1.08)*	.48
Flexible	4.02 (1.29)	4.54 (1.06)*	.43
Polite	3.37 (1.29)	3.92 (0.99)*	.47
Employable	3.57 (1.32)	4.37 (1.28)**	.59
Likeable	2.90 (1.03)	3.39 (1.03)*	.47
Trustworthy	3.08 (1.11)	3.46 (1.09)	.35
Honest	2.84 (1.07)	3.19 (1.17)	.31
Total	*34.51 (8.58)*	*39.14 (6.78)***	*.60*

Note. Ratings were made on 7-point Likert scale. Higher ratings indicate more negative judgments. Significant at *$p < .05$, **$p < .01$.

Implicit Measure

Both "brain and head injury" IAT scores were positive indicating stronger associations between negative attributes and brain/head injury than body injury, although neither IAT effect was significant (single sample *t* test compared with zero, p = ns), and there was no significant difference in IAT scores between those who completed the Head injury IAT ($M = 0.05$; $SD = .63$) and those who completed the Brain injury IAT ($M = 0.12$; $SD = .54$); $F(1,48) = 0.19$; $p = .66$; $d = .13$. Participants who were unfamiliar with brain injury, however, demonstrated a significant implicit bias ($M = .19$; $SD = .52$, single sample *t* test > 0; $p < .05$) by more strongly associating negative attributes with brain rather than body injuries.

DISCUSSION

The results showed that negative attitudes toward people who have sustained brain injuries occur in the community.

[1] No effect of Sex or Age was found.

[2] Mean judgements were not statistically different between participants who had experienced a brain/head injury and those who knew someone who had. Scores were collapsed to form the "familiar" group.

https://doi.org/10.1017/S1355617710000524 Published online by Cambridge University Press

These negative attitudes are expressed explicitly with individuals openly endorsing less desirable characteristics to a young adult who experienced a brain injury as a child compared with a young adult who did not. In particular, they were regarded as less mature, intelligent, flexible, polite, and employable. In addition as predicted, using the term "brain injury" resulted in the individual being judged more negatively than when the term "head injury" was applied to the same injury event.

Familiarity with brain injury proved a critical factor in both the explicit and implicit contexts. Individuals who are more familiar with brain injury are explicitly less negative regarding those who have sustained such an injury and only those unfamiliar demonstrate a negative implicit bias. These findings are in line with research showing familiarity with mental illness is associated with less dangerous perceptions of people suffering mental illness (Angermeyer, Matschinger, & Corrigan, 2004; Corrigan, Edwards, Green, Diwan, & Penn, 2001). It further suggests that, when people have more knowledge about or experience with brain injury, they will be less likely to endorse negative stereotypes. Initiatives that increase the public's familiarity with brain injury and realistic sequelae may decrease negative evaluations.

It is likely that negative perceptions of the public will have a significant impact on rehabilitation following TBI. Previous research has shown that social factors play a crucial role in ongoing recovery of all patients who experience a chronic physical and/or mental health issue (Fogel, Fauerbach, Ziegelstein, & Bush, 2004). Conditions that are associated with TBI, such as epilepsy, physical disabilities, and mental health issues, are all heavily stigmatized. Stigma limits positive social experience and consequences often include isolation, limited life chances, poorer housing and employment, difficulty in gaining medical and mental health care, and slower recovery from illness (Link & Phelan, 2006). A more positive evaluation of individuals who have experienced TBI is likely to enhance the social experience and functions for those individuals who have experienced a brain injury, which can greatly influence recovery and quality of life.

It should be noted, however, that knowledge may also be contingent on a better understanding of the nomenclature used to describe TBI. As stated, the present study found that head injury and brain injury were evaluated differently, the latter being associated with more negative attitudes. Further education may help to de-stigmatize the term brain injury.

The present research found negative attitudes to be more pervasive in the explicit than implicit context. Contrary to explicit attitudes, implicit bias was only found among individuals unfamiliar with brain injury. Overall, individuals demonstrated a tendency toward a negative bias but this trend did not reach significance. It is not unusual to find a negative bias in one context and not the other given evaluations made after deliberation can differ from more automatic judgments. Our findings suggests that negative evaluations of people with brain injury are not necessarily underpinned by an automatic or deep-seated bias, but rather are due to an openly held belief that brain injuries result in personality changes or deficits that render a person as less desirable. The explicit nature of the bias means it is reasonable to speculate that such negative attitudes may be more easily open to education, communication, and therefore amelioration (Rydell, McConnell, Strain, Claypool, & Hugenberg, 2007).

A limitation of this study was the use of a self-selected sample of individuals which limits the generalizeability of the findings. In addition, by specifically prescribing that the TBI event was sustained by a child, we have limited our ability to conclude that the findings of the present study would generalize across other age groups or levels of perceived culpability. Another limitation of this study is that there is not yet any evidence that our measure of explicit attitude is associated with actual stigmatization of individuals with TBI. Future studies could examine the relationship between self-reported indices of potential attitude and actual behaviors toward those with TBI. The context in which negative attitudes toward those with TBI exists is an area of research in need of further elucidation. Whether or not level of education impacts community attitude toward those with TBI is such an example, although this factor had little influence on the accuracy of TBI knowledge (Hux et al., 2006), future research should measure the effect on negative attitudes. A focus on perceptions of different sub groupings, that is, old versus young could also be useful in terms of identifying where the negative perceptions are developed and within which groups. Information of this type is essential to develop strategies to improve the public's knowledge and perception of brain injury, and reduce negative stereotypes associated with brain injury.

ACKNOWLEDGMENTS

The research was conducted during tenure of an ACC Post-Doctoral Research Career Development Award from the Health Research Council of New Zealand and the Accident Compensation Corporation awarded to Audrey McKinlay. Alana Bishop was supported by a Summer Scholarship 2009–2010 jointly funded by the University of Canterbury and the Tertiary Education Commission of New Zealand (TEC). This research received ethical approval from the Human Ethics Committee, University of Canterbury, New Zealand. We acknowledge that the information in this manuscript and the manuscript itself has never been published either electronically or in print. The authors have no conflict of interest in the production of this manuscript.

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APPENDIX

Questionnaire

Tony is 25 years old. When he was 10 years old he was injured in a car accident and experienced a head (brain) injury.

Based on your knowledge of outcomes associated with head (Brain) injury rate Tony compared to other people of this age on the following attributes based on your first thought:

Circle the number that best represents your thoughts:

Sociable	1	2	3	4	5	6	7	Unsociable
Friendly	1	2	3	4	5	6	7	Distant
Mature	1	2	3	4	5	6	7	Immature
Intelligent	1	2	3	4	5	6	7	Stupid
Flexible	1	2	3	4	5	6	7	Rigid
Polite	1	2	3	4	5	6	7	Rude
Employable	1	2	3	4	5	6	7	Unemployable
Likeable	1	2	3	4	5	6	7	Unlikeable
Trustworthy	1	2	3	4	5	6	7	Suspicious
Honest	1	2	3	4	5	6	7	Deceptive

Please answer the following:

1. Your age: _____
2. Sex: M / F

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3. Have you ever experienced a head (brain) injury? Yes / NO AGE(S) _____
4. Do you know anyone who has experienced a head (brain) injury? Yes / NO
5. Have you ever experienced a concussion? YES / NO AGE(S) _____

Peter is 25 years old. When he was 10 years old he was injured in a car accident and experienced a limb injury.

Based on your knowledge of outcomes associated with limb injury rate Peter compared to other people of this age on the following attributes based on your first thought:

Circle the number that best represents your thoughts:

Sociable	1	2	3	4	5	6	7	Unsociable
Friendly	1	2	3	4	5	6	7	Distant
Mature	1	2	3	4	5	6	7	Immature
Intelligent	1	2	3	4	5	6	7	Stupid
Flexible	1	2	3	4	5	6	7	Rigid
Polite	1	2	3	4	5	6	7	Rude
Employable	1	2	3	4	5	6	7	Unemployable
Likeable	1	2	3	4	5	6	7	Unlikeable
Trustworthy	1	2	3	4	5	6	7	Suspicious
Honest	1	2	3	4	5	6	7	Deceptive

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