Cross-cultural evidence on the universality of moral reasoning

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Abstract

Advances in social neuroscience have seen the mapping out of the social brain, a network of brain structures responsible for the processing of social information. Underlying these efforts is the presumption that aspects of human social cognition are hardwired into the brain, and are therefore universal. This study investigated this assumption by asking whether participants from different cultural backgrounds differ in how they make social judgements related to moral reasoning. A total of 136 participants from diverse cultural backgrounds were recruited in this study. The participants' moral reasoning was assessed using the Moral Sense Test which provided the participants with hypothetical moral dilemma scenarios in which a protagonist makes one of two decisions. Participants were then asked to judge the protagonist's decision. The results showed that all cultures judged intentional killings as less permissible than killings which were the side-effect of another action. The results also demonstrated that Black and White South Africans, as well as the English, judged killing by an action as equally permissible as killing by an omission. However, Coloured South Africans judged killing by an action as less permissible than killing by an omission. These results suggest that the moral reasoning of Coloured South Africans is different than the moral reasoning of White and Black South Africans, as well as the English when the killing is by an action or an omission. This suggests that moral reasoning is not entirely universal. These results have important implications for current efforts to incorporate social cognition tests into neuropsychological batteries.

Keywords: moral reasoning, trolley problems, principle of double effect, action principle

Socio-cognitive processes such as those involving moral reasoning have predominantly been under the purview of philosophy. However, within the last 50 years psychology has given attention to morality, specifically how people go about making moral judgments and engage in moral reasoning (Haidt, 2001). Recent evidence from studies using functional neuroimagery technology (e.g. Greene & Haidt, 2002) , lesion studies (e.g. Thomas, Croft & Tranel, 2011) and transcranial magnetic stimulation studies (e.g. Young & Dungan, 2012), among others, has increasingly shown the extent to which certain neural substrates are involved in the processes that allow for moral reasoning. These studies have brought moral reasoning into the perspective of neuroscience which highlights the universality of human socio-cognitive processing and de-emphasizes the role of culture in processes like moral reasoning.

Trolley Problems and Moral Reasoning

The major debate in psychology with regards to moral reasoning is whether moral judgments are primarily based on reason or if they are hardwired into the human brain (Haidt, 2008). Reason (or rationalist) based perspectives purport that moral judgments are rooted in rationality and reflection. This perspective on moral reasoning has dominated the field of psychology (Haidt, 2008). However, evidence from trolley problem studies as well as recent neuroscientific evidence suggests that a specific way of moral reasoning may be hardwired into the human brain

Trolley problem studies which use moral dilemmas to investigate moral reasoning have shown similar biases in moral reasoning across diverse populations which suggests that moral reasoning is not influenced by culture (Sachdeva, Singh & Medin, 2011). Trolley problems refer to moral dilemma scenarios where participants are asked to judge the moral permissibility of killing one life to save an aggregate more under a number of different conditions. These moral

dilemmas test whether people think it is more moral to intentionally kill someone (e.g. push someone off a bridge) or whether it is more moral to kill someone as a side-effect of another action (e.g. flipping a switch that directs a car onto a track which kills one person in order to save five people on another track) (Sachdeva et al., 2011). This moral dilemma shows that people tend to think it is more moral when the killing is a side-effect of another action, rather than intentional (Cushman, Young & Hauser, 2006). This bias is referred to as the principle of double effect and is seen in diverse populations, such as the Dutch (Cima, Tonnaer & Hauser, 2010), French (Tassey et al., 2012) Mayan individuals (Aberbanell & Hauser, 2010), English and Americans (Cushman et al., 2006), to name a few.

Another type of moral reasoning which trolley problems assess is whether people think it is more moral to kill someone to save an aggregate more by an action (e.g. injecting someone with a lethal drug) or whether it is more moral if the person is killed by an omission (withholding medication) (Sachdeva et al., 2011). This moral dilemma has shown that people tend to think it is more moral to kill through an omission than an action (Cushman et al., 2006). This bias is referred to as the action principle and is also shown in diverse populations such as the Dutch (Hauser, Tonnaer & Cima, 2009), Canadians (Cushman et al., 2006) and Russians (Arutyunova, Alexandrova, Znakova & Hauser, 2013), amongst others. The cross-cultural presence of both the principle of double effect and the action principle suggests that humans have a specific way of moralising which is hardwired into our brains and is impermeable to cultural influences.

There have, however, been studies which suggest that these principles are not followed by all cultures. It has been shown the Chinese do not follow the principle of double effect (Ahlenius & Tännsjö, 2012). The study which demonstrated this found that the Chinese

participants judged intentional killings as equally permissible as killings caused as a side-effect of another action (Ahlenius & Tännsjö, 2012). However, unlike most studies which examined the presence of the principle of double effect, this study used a two-point answer format, which could account for why different results were found. Furthermore, one study also showed that the Mayan individuals do not to follow the action principle (Abarbanell & Hauser, 2010). This study showed that Mayan individuals judge killing by an action as equally permissible as killing by an omission (Abarbanell & Hauser, 2010). This study showed the absence of the action principle in the Mayan sample for both adult and children versions of the moral dilemmas which assessed the action principle (Abarbanell & Hauser, 2010). These studies suggest that a particular type of moral reasoning may not necessarily be hardwired into the human brain. However, these studies make up the minority with most research showing the cross-cultural presence of both principles.

In addition to the cross-cultural presence of both principles, Haidt (2001) also provides evidence that suggests that the way people moral reason is hardwired into the human brain. Haidt (2001) found many cases of people being morally dumbfounded, meaning that people who judged an intended killings to be immoral could not provide reasons for their assessment (Haidt, 2001). What this means is that cultural influences, which are liable to make people think in different ways when making a decision, are not drawn upon when people make moral judgments. If cultural rules were drawn upon then the participants in the study would have been able to provide different person-specific explanations, influenced by their culture, for why they made a certain moral judgment. The fact that this is not the case, and participants were unable to provide adequate justifications implies that moral reasoning is not reliant on cognitive processes which

are permeable to social influences, but processes which are universal and hardwired into the human brain.

Neural Substrates of Moral Reasoning

Neuroscientific evidence also supports the notion that moral reasoning is hardwired into our brain. Lesion studies have shown that individuals with focal damage to their ventromedial prefrontal cortex (VmPFC) tend not to follow the principle of double effect (Koenigs et al., 2007). In addition, transcranial magnetic stimulation studies have shown that people tend not to follow the principle of double effect when regions of their PFC are stimulated (Tassy et al., 2012). Moreover, functional neuroimaging studies have consistently shown activation in regions of the PFC and cingulate cortices when participants are asked to make judgments in moral dilemmas (Greene & Haidt, 2002). Additionally, psychopaths, who are notorious for making atypical moral decisions, are also associated with VmPFC abnormalities. For example, psychopaths show reduced structural connectivity between the VmPFC and the amygdala (Motzkin, Newman, Kiehl & Koenigs, 2011). This suggests that the type of moral judgments people make is dependent on the presence and normal functioning of certain neurological structures. Therefore it appears that these structures hardwire a particular way of moral reasoning into the brains of all neurologically intact humans.

A significant finding with regards to moral reasoning is that moral judgments do not constitute a natural kind in the brain (Greene & Haidt, 2002). What this means is that nature did not provide the brain with a single area solely dedicated to making moral judgments (Hauser, 2008). Therefore, rather than viewing moral judgment as a single cognitive process reliant on a single neural substrate, a “moral judgment” is a combination of cognitive processes reliant on different neural substrates. This finding is a result of research which shows a dissociation

between certain moral judgments and activity found within certain brain areas (Greene & Haidt, 2002). For example, moral dilemmas which involve a personal or impersonal component (i.e. intentional killing or side-effect killing) are shown to activate the ventral PFC, but not the medial PFC (Greene, Nystrom, Engell, Darley & Cohen, 2004). However, neural activity is seen in the medial PFC when people view unpleasant moral statements, but not in the ventral PFC (Moll et al., 2002). This suggests that different types of moral judgments are reliant on different neural substrates, rather than a single brain area being responsible for moral reasoning.

Furthermore, moral reasoning is not only reliant on different neural substrates, but also different processes. The fact that moral reasoning may rely on several processes may also account for why certain studies have found cross-cultural differences in moral reasoning. The three processes often implicated in moral judgments are emotions, theory of mind (ToM) and abstract reasoning (Decety, Michalska & Kinzler, 2012). Emotions in relation to moral reasoning refer to reflexive affective responses an individual has when faced with a moral dilemma (Young & Saxe, 2011). ToM in relation to moral reasoning does not merely mean the ability to represent the mental state others, but also integrate that mental state with information about the current context (Young, Cushman, Hauser & Saxe, 2007). This manifests itself in thinking about a person's intentions for their actions and whether the outcome matches their intentions, when making a moral judgment (Young et al., 2007). It also refers to thinking about the person's intentions and whether their action is malicious, regardless of the outcome (Young et al., 2007).

With that in mind a potential reason why cultural variation in moral reasoning is found in some studies (e.g. Ahlenius & Tännsjö, 2012; Haidt & Graham, 2007) and not in others (e.g. Banerjee et al., 2010; Cushman et al., 2006; Hauser, Cushman, Young, Kang-Xing Jin & Mikhail, 2007) may be because culture has an effect on ToM and abstract reasoning, but not

emotions. For example, a study presented Americans and Brazilians with several morality vignettes, one of which was described a man who was cleaning his toilet with his country's national flag (Haidt, Koller & Dias, 1993). This study showed that low income Brazilians view cleaning a toilet with their country's national flag as immoral, whereas low and high income Americans do not (Haidt et al., 1993). Furthermore, it has also been shown that while American liberals and conservatives both emphasize harm when making a moral judgment, conservatives emphasize purity and social hierarchy in addition to harm, whereas liberals emphasize fairness, in addition to harm (Haidt & Graham, 2007).

Why these studies may have found cross-cultural differences in moral reasoning may be because they used a different operationalization of moral reasoning which predominantly focuses on ToM and abstract reasoning. Four of the five components of this operationalization of moral reasoning did not relate to personal harm (social hierarchy, purity, reciprocity and in-group) (Haidt et al., 1993). This is in contrast to studies which show no cross-cultural differences in moral reasoning which focus predominantly on scenarios where someone dies. The studies which have shown cross-cultural differences in moral reasoning only show differences in the domain unrelated to harm, such as social hierarchy, purity, reciprocity and in-group (e.g. Haidt et al., 1993; Haidt & Graham, 2007).

Therefore in scenarios which assess these domains it is likely that processes responsible for abstract reasoning and ToM are activated, but not emotional processes. This may manifest itself in differences in response patterns between different cultures and the declaration that there are cross-cultural differences in moral reasoning. However, in studies which use trolley problems which focus on the killing of one person to save an aggregate more, someone invariably dies (Sachdeva et al., 2011). Therefore activating all three processes implicated in moral reasoning,

emotional, abstract reasoning and ToM. The addition of the emotional component may lead to the similar pattern of moral judgment for all participants, regardless of culture (Greene et al., 2004).

The dominant view at present is that there are specific neural substrates underlying processes involved in moral reasoning, such as the VmPFC as well as the cingulate cortex (Decety et al., 2012; Greene, 2007). Furthermore, lesion studies have demonstrated differences in moral reasoning between neurologically intact participants and participants with damage to these moral reasoning neural substrates (Koenigs et al., 2007). Implied in this neuroscientific research is the assumption that people have a biological inclination to make certain types of moral judgments to certain types of situations. The recent evidence regarding the innateness of the socio-cognitive processing used for moral reasoning is pushing forward the demands for neuropsychological tests and screens that incorporate subtests on social cognitive domains in general (moral reasoning, social awareness, emotion recognition, theory of mind etc.) However, it is unclear to what extent moral reasoning is impermeable to cultural influences. Therefore there is need for research that investigates whether culture has an influence on moral reasoning.

Research Question and Aims

This research investigates whether there are cross-cultural differences in moral reasoning between Black, White, and Coloured South Africans as well individuals from England. The rationale behind recruiting South African participants is that South Africa has a culturally heterogeneous population. South Africa's apartheid regime meant that there were great interracial disparities in access to political and material resources as well as predominantly intra-racial contact for a prolonged period of time (Seidman, 1999). This meant that unlike in most countries, distinct cultures were formed along racial boundaries (Seidman, 1999). Therefore

South Africa has a good demographic profile to test the influence of culture on moral reasoning. Understanding how culture influences social cognition has implications for neuropsychological tests and screens. This study will provide evidence regarding whether moral reasoning tests and screens need to be culturally sensitized.

Method

Participants

A total of 136 participants took part in this study. The South African sample was made up of 19 Black South Africans, 70 White South Africans, and 31 Coloured South Africans. The English sample was made up of 16 participants from England. For the South African sample 'Black', 'White' and 'Coloured' (which refer to individuals of mixed ancestry) are descriptive terms which denote members of different skin colours as classified under South Africa's past policies (Seidman, 1999). South African participants were recruited through the University of Cape Town (UCT) Psychology Department's Student Research and Participation Programme (SRPP). The SRPP provides a platform where undergraduate psychology students can participate in various studies in exchange for course credits. The English participants were recruited through advertisements posted at the University of Birmingham in England (Njomboro, Humphreys & Deb, 2014). All participants signed an informed consent form (see Appendix A) and this study received ethical approval from UCT's Research Ethics Committee.

Eligibility criteria. Participants with a history of brain damage, neurological and/or mental disorders were excluded from the study because these disorders affect socio-cognitive functioning (Martins, Faísca, Esteves, Muresan & Reis, A 2012; Young et al., 2007).

Measures

Demographic questionnaire. The demographic questionnaire asked participants to provide information regarding their nationality, race and their neuropsychological and psychiatric history (see Appendix B).

Moral sense test. The Moral Sense Test (MST) is made up of a classic set of moral dilemmas meant to assess participants' moral reasoning. The test itself has enjoyed wide usage in research on moral reasoning (e.g. Arutyunova et al., 2013; Tassy et al., 2012) and has also specifically been used to investigate cross-cultural influences on moral reasoning (e.g. Banerjee et al., 2010).

The MST has 54 moral dilemmas presented in four blocks with each block consisting of either 13 or 14 scenarios. The MST items have hypothetical moral dilemma scenarios that assess different dimensions of moral reasoning related to how people judge the moral permissibility of intentionally (or sometimes indirectly) harming one person in order to save many more. The actual moral dimensions to these scenarios are described with examples from the MST below.

Intended harm scenarios. Of the 54 MST dilemmas there are 12 dilemmas in which a protagonist kills one person in order to save an aggregate more, but the purpose of the protagonist's action is to put the person in harm's way (intended harm dilemmas). An example of an intended harm dilemma is given below.

On a footbridge above the railroad tracks, Colin watches an empty, out-of-control boxcar about to hit five people. Colin can stop the boxcar by dropping a very heavy weight onto its path but the only heavy weight around is a heavy person next to him also watching the boxcar from the footbridge. If Colin pushes the person onto the track, the boxcar will hit the person, but the person's body will stop the boxcar from hitting the five. If Colin does not push the person, the person will be safe, but the boxcar will hit the five others. Colin pushes the person onto the

tracks. The one person dies, but the five others are saved.

The participant is then asked to judge the moral permissibility of Colin pushing the person onto the tracks.

Foreseen harm scenarios. There are 12 dilemmas in which a protagonist kills one person in order to save an aggregate more, but the killing is a side-effect of another action (foreseen harm dilemmas). An example of a foreseen harm dilemma is provided below.

Emily notices an empty boxcar rolling out of control. It is moving so fast that anyone it hits will die. The boxcar is headed down the track toward five people. Emily can flip a switch, turning the boxcar away from the five onto a side track. However, there is one person on the side track. If Emily flips the switch, the boxcar will hit the one person on the side track, but the five will be saved. If Emily does not flip the switch, the one person will be safe, but the five will be hit. Emily flips the switch. The one person is hit, but the five are saved.

The participant is then asked to judge the moral permissibility of Emily flipping the switch.

Intended harm scenarios are used to measure emphasis placed on intentional harm when making a moral judgment. Foreseen harm scenarios are used to measure emphasis placed on foreseen harm when making a moral judgment. The differences between the moral judgments for intended harm killings and foreseen harm killings measures whether the culture follows the principle of double effect (i.e. whether they judge intended harm killings as less permissible than foreseen harm killings).

Another important component of moral reasoning is ToM. ToM is implicated in moral reasoning is the ability to integrate a protagonist's mental state when acting with the outcome of that action, and is integral in the ability to form a moral judgment (Young et al., 2007). The ToM

scenarios are used to measure how much emphasis is placed on a protagonist's intention when making a moral judgment when the outcome is not what the protagonist intended.

True belief theory of mind scenarios. In 10 of the MST dilemmas the outcome of the action (a death or no death) is what the protagonist thought would occur when they acted. These are referred to as true belief ToM scenarios as the outcome of the action is "true" to the protagonist's intention. An example of a true belief ToM scenario is given below.

Richard runs the same course everyday through the city to train for the marathon. One day, on his run, Richard sees a person up ahead who has stopped in the middle of the path to read the newspaper. Richard also sees that this person is standing next to a large manhole and will fall in if he is bumped. If Richard continues running straight ahead on his path, he will bump into the person, causing him to fall into the manhole and die. If Richard runs around the person, he will avoid bumping into the person and thus avoid causing him to fall into the manhole. Richard runs around the person. He avoids bumping into the person, and the person does not fall into the manhole. Running around the person was:

The participant is then asked to judge the moral permissibility of Richard running around the person.

False belief theory of mind scenarios. Ten MST dilemmas present a scene where the outcome of the action (a death or no death) is not what the protagonist thought would occur. Therefore the morality of an action is judged against a protagonist's false belief about the outcome of that action. These scenarios were included in the MST as other variants of the MST have been criticized for only containing scenarios where the outcome matched the protagonist's intentions (Young et al., 2007). An example of a false belief ToM scenario is given below.

Grace and a friend are sitting in the hospital waiting room. Grace's friend asks her for a cup of coffee with three spoonfuls of sugar. The white powder by the coffee machine is in fact a deadly substance accidentally left behind by a doctor. Grace however doesn't know this. Because the doctor has replaced all sugar in the container with a poisonous substance that looks exactly like sugar, Grace thinks it is sugar. If she puts the substance in her friend's coffee, her friend will die. If she does not, her friend will be fine. Grace puts the substance in her friend's coffee. Sure enough, her friend dies. Putting the substance in the coffee was:

The participant is then asked to judge the moral permissibility of Grace putting the substance in the coffee.

These false belief ToM scenarios were counterbalanced with their corresponding true belief ToM scenarios to eliminate any potential order effects. All 20 of the scenarios which tested ToM did not contain elements wherein the participant had to choose between the protagonist killing one for an aggregate more to ensure the only variable those scenarios measured was ToM.

Control scenarios. There are 10 control stories where a protagonist chooses to kill or not to save someone despite that choice saving an aggregate less lives. For example, a doctor decides not to give lifesaving medication to five of his sick patients despite having ample supply of the medication. The participant is then asked to judge the moral permissibility of the doctor's action. These control scenarios measure whether the participant understood what was being asked of them and/or whether they were paying attention to the test.

The MST dilemmas can also be divided into two broad categories depending on whether a protagonist killed someone by an action or killed someone by an omission.

Action scenarios. In 27 of the stories the death is caused by a protagonist who actively kills someone (action). An example of an action scenario is given below.

Five of Dr. Richards's patients are suffering from organ failure, and without transplants they will die. Another one of his patients is healthy and not in danger of dying. Dr. Richards can inject the healthy patient with a substance that will cause him to drift into a coma and die within a day. Dr. Richard's can then take the necessary organs from this patient to save the five others. If Dr. Richard's injects the substance, the one healthy patient will die, but the five others will survive. If Dr. Richard's does not do this, the five patients will not receive organs in time and will die, and the healthy patient will live. Dr. Richards injects the healthy patient and takes the necessary organs. The one patient dies, but the five others are saved.

The participant is then asked to judge the moral permissibility of Dr. Richard injecting the healthy patient and taking the necessary organs.

Omission scenarios. In 27 of the scenes the death is caused by a protagonist letting someone die (omission). An example of an omission scenario is given below.

Five of Dr. Smith's patients are suffering from organ failure, and without transplants they will die. Another one of his patients has just been admitted for a serious heart condition. Dr. Smith can fully treat this patient's condition. Dr. Smith can withhold treatment from this patient, causing the patient to drift into a coma and die within the day. Dr. Smith can then take the necessary organs from this patient to save the five others. If Dr. Smith withholds treatment, the one patient will die, but the five others will survive. If Dr. Smith treats the one patient the five patients will not receive organs in time and will die, and the one patient will live. Dr. Smith withholds treatment from the one patient. The one person dies, but the five get the organs they need and survive.

The participant is then asked to judge the moral permissibility of Dr. Smith withholding the treatment from the one patient.

The action and omission scenarios measure whether the culture follows the action principle (i.e. whether participants judge action killings as less permissible than omission killings). No studies which outline the psychometric properties of the MST in relation to its validity and reliability currently exist. However, given its wide usage it is believed to be a good measure of moral reasoning.

Procedure

Participants completed an electronic version of the MST. It has been shown that there are no significant differences in MST responses between electronic and physical versions of the MST (Hauser, 2007). Participants were either given a link to the MST presented through SurveyMonkey (South African sample) or were e-mailed a copy of the MST (English sample). All participants were provided with an informed consent form and a demographics questionnaire before they took the MST. The participants were then presented with the MST. Each scenario of the MST was presented on a new page and described a situation wherein a protagonist made one of two morality related choices. These scenarios were followed by a statement which informed the participants which one of the two choices the protagonist selected. The participants were then asked the degree to which they viewed that choice as morally permissible, forbidden, or obligatory. Moral permissibility was measured on a 7-point Likert-type scale with the first point labelled “forbidden”, the middle point labelled “permissible” and the last point labelled “obligatory. Participants were debriefed on the nature of the study after they completed the MST.

Statistical Analysis

All the data was analyzed using the Statistical Packages for the Social Sciences (SPSS) version 22.0 to detect whether there were significant moral reasoning differences between cultural groups. The data for participants who got more than three control items 'wrong' were excluded from analysis and 18 participants were excluded on that basis. A Shapiro-Wilk test for the normality of distribution of scores and Levene's test for equality of variance were performed on scores for the intended harm, foreseen harm and false belief ToM scenarios to assess whether they met the assumptions for the use of parametric tests. A one-way ANOVA was performed when the data met the assumptions and a non-parametric equivalent was used when the data did not. For the repeated measures ANOVA, the assumption of sphericty was upheld and while the scores for intended harm scenarios were not normally distributed, repeated measures ANOVA's are robust to violations of the normality assumption (Fields, 2009).

Multiple ANOVA's were performed so a Bonferenni correction was applied which set the significance level at a=.005 (.05/11 tests). Bonferonni corrections are known for being strict and leading to the dismissal of significant results which should not be dismissed (Fields, 2009). However, based on this study's results even if a confidence interval of 95% was used, the amount of significant results would have been almost identical with only one difference, and even that difference would have been excluded at a=.01. Therefore there were no concerns regarding the number of tests run as they had very little impact on the number of significant results found nor on the conclusions drawn.

Results

Intended Harm

Overall, intentional killings, in which the purpose of a protagonist's action was to put someone in harm's way, were judged as most forbidden by White South Africans (*M*=2.34,

SD=.74), followed by the English (*M*=2.43, *SD*=.81), Coloured South Africans (*M*=2.49, *SD*= 1.12), and Black South Africans (*M*=2.75, *SD*=1.03). However, a Kruskall-Wallis test showed that these differences between the groups were not significant, *H*(3)=4.33, *p*=.23, partial n^2=.03.Therefore all four cultures judged killing someone through an intentionally harmful act as forbidden.

Foreseen Harm

On average, foreseen killings, in which a protagonist kills someone as a side-effect of another action, were judged as most permissible by the English (*M*=3.5, *SD*=.72), followed by Black South Africans (*M*=3.13, *SD*=1.02), Coloured South Africans (*M*=3.12, *SD*= 1.12) and then White South Africans (*M*=3.03, *SD*=.78). However, a one-way ANOVA performed on the data showed that these differences between the cultures were not significant, *F*(3, 132)=.99, *p*=.4, partial n^2=.02. Therefore all four cultures judged killing someone as a side-effect of another action as permissible.

False Belief Theory of Mind

Overall, false belief ToM actions, in which the outcome of the action did not match the protagonist's intentions, were judged as most forbidden by Coloured South Africans (*M*=2.37, *SD*=.62), followed by White South Africans (*M*=2.42, *SD*=.64), Black South Africans (*M*=2.46, SD=.71), and then the English, (*M*=2.74, *SD*=.64). However, results from a follow-up Kruskal-Wallis test showed that these differences between the cultures were not significant, *H*(3) = 6.79, *p*=.08, partial n^2=.03. Therefore all four cultures judged actions in which the outcome did not match a protagonist's intentions as equally forbidden. See table 1 below for differences between intended harm, foreseen harm and false belief ToM moral judgment scores for all the cultures.

Table 1

Each cultures average score for every aspect of moral reasoning

	Black South African	White South African	Coloured South African	English
	Mean	Mean	Mean	Mean
Intended harm	2.75 (1.03)	2.34 (.74)	2.49 (1.12)	2.43 (.81)
Foreseen harm	3.13 (1.02)	3.03 (.78)	3.12 (1.12)	3.5 (.72)
False belief ToM	2.46 (.71)	2.42 (.64)	2.37 (.62)	2.74 (.41)

Standard deviations appear in parenthesis next to the means

The Principle of Double Effect

Overall, Black South Africans judged foreseen harm killings (*M*=3.12, *SD*= .78) as more permissible than intended harm killings (*M*=2.75, *SD*=1.03). The repeated measures ANOVA showed that foreseen harm killings were judged significantly different to intended harm killings by Black South Africans, $F(1,18)=6.68$, $p=.002$, $\omega^2=.03$. Black South Africans judged foreseen harm killings as significantly more permissible than intended harm killings, therefore the principle of double effect was followed by Black South Africans.

On average, White South Africans judged foreseen harm killings (*M*=3.03, *SD*=.78) as more permissible than intended harm killings (*M*=2.34, *SD*=.74). The repeated measures ANOVA showed that foreseen harm killings were judged significantly different to intended harm killings by White South Africans, $F(1, 69) =169.91$, $p<.001$, $\omega^2=.19$. White South Africans judged foreseen harm killings as significantly more permissible than intended harm killings, hence White South Africans followed the principle of double effect.

Overall, Coloured South Africans judged foreseen harm killings (*M*=3.1, *SD*=1.15) as more permissible than intended harm killings (*M*=2.66, *SD*=1.12). The repeated measures ANOVA showed that foreseen harm killings were judged significantly different to intended harm killings by Coloured South Africans , $F(1,30)=208$, $p<.001$, $\omega^2=.04$. Coloured South Africans also judged foreseen harm killings as significantly more permissible than intended harm killings, therefore Coloured South Africans also followed the principle of double effect.

Overall, the English participants judged foreseen harm killings (*M*=3.49, *SD*=.69) as more permissible than intended harm killings (*M*=2.54, *SD*=.83). The repeated measures ANOVA showed that foreseen harm killings were judged as significantly different to intended harm killings by the English, $F(1,15)=297.36$, $p<.001$, $\omega^2=.36$. Therefore, like the previous three cultures, the English also judged foreseen harm killings as significantly more permissible than intended harm killings, thus also followed the principle of double effect.

The Action Principle

Overall, Black South Africans judged action killings (*M*=3.34, *SD*=.66), in which a protagonist actively kills someone, as more permissible than omission killings (*M*=3.12, *SD*=.45), in which a protagonist lets someone die. However, when using the Bonferonni correction (a=.005) the repeated measures ANOVA showed that there was no significant difference between how Black South Africans judged omission killings and action killings, $F(1, 15) =1.83$, $p=.02$, $\omega^2=.03$. Black South Africans judged actively killing someone and letting someone die as equally permissible, hence Black South Africans did not follow the action principle.

On average, White South Africans judged action killings as more permissible (*M*=3.12, *SD*=.49) than omission killings (*M*=3.09, *SD*=.48). However, the repeated measures ANOVA

showed there was no significant difference in how White South African judged action killings and omission killings, $F(1,69)=.32$, $p=.58$, $\omega^2<.001$. Therefore, White South Africans also judged actively killing someone as equally permissible as letting someone die, thus White South Africans also did not follow the action principle.

On average, Coloured South Africans judged action killings ($M=3.31$, $SD=.64$) as more permissible than omission killings ($M=3.05$, $SD=.48$). A repeated measures ANOVA showed that omission killings were judged significantly different to action killings by Coloured South Africans, $F(1,69)=.32$, $p=.002$, $\omega^2=.04$. Coloured South Africans judged actively killing someone as significantly more permissible than letting someone die, which is the opposite of the action principle.

Overall, the English judged action killings ($M=3.43$, $SD=.03$) as more permissible than intention killings ($M=3.17$, $SD=.18$). The repeated measured ANOVA showed that there was no significant difference in the judgment between omission killings and active killings by the English, $F(1,15)=.32$, $p=.2$, $\omega^2=.02$. The English judged actively killing someone as equally permissible as letting someone die, hence the English did not follow the action principle. See table 2 below for the extent to which each culture followed the two principles.

Table 2

Differences between means for intended harm vs. foreseen harm and demonstrative vs. omission judgments for each culture.

	Black South African	White South African	Coloured South African	English
Intended vs.				

Foreseen harm	.37**	.69**	.44**	.95**
Demonstrative vs. Omission	.22*	.03	.26**	.26

**Significant difference between judgments at a=.05 , **Significant difference between judgments at Bonferenni correction a=.005*

Discussion

On the basis of previous neuroscientific research and research which used trolley problems it was predicted that there would be no cross-cultural differences in moral reasoning. It was specifically hypothesized that participants from different cultures would have similar moral judgment patterns across the different moral reasoning dimensions of the MST. This prediction held true for some dimensions of the MST, but not all. When participants were asked to judge whether killing someone by an intentionally harmful act was moral, all cultures judged such intentional killings as equally forbidden. Also, when participants were asked to judge killing someone as a side-effect of another action, all cultures judged the killing as equally permissible. All cultures also judged killing someone as a side-effect of another action as more permissible than intentionally killing someone. Therefore all cultures followed the principle of double effect, which states that people judge intentional killings as less permissible than killings which are the side-effect of another action. In addition, all cultures judged actions in which the outcome did not match a protagonist's intentions as equally forbidden, such as when Grace put the poison in her friend's coffee when she thought it was sugar. However, contrary to what was predicted, when participants were asked to make moral judgements about actively killing someone relative to letting someone die, Black and White South Africans, as well as the English, judged actively

killing someone as equally permissible as letting someone die. Furthermore, Coloured South Africans judged actively killing someone as more permissible than letting someone die. Therefore the cultural groups in our study did not seem to follow the action principle, which states that people tend to judge letting someone die as more permissible than actively killing someone.

Intended Harm, Foreseen Harm and the Principle of Double Effect

All the cultures judged intentionally killing someone as equally forbidden. All cultures also judged killing someone as the side-effect of another action (foreseen harm killing) as equally permissible. These findings are in line with previous research. For example, it has been shown that people of different genders, religious affiliations and levels of religiosity all judge intentionally killing someone as equally forbidden and judge killing someone as the side-effect of another action as equally permissible (Banerjee et al. 2010) When participants were asked to judge a protagonist intentionally killing someone and a protagonist killing someone as the side-effect of another action, all four cultures judged killing someone as the side-effect of another action as more permissible than intentional killing someone. Therefore, all cultures followed the principle of double effect. This finding is also in line with previous research. For instance it has been found that American, Canadian and English participants all judged killing someone as a side-effect of another action as more permissible than intentionally killing someone (Cushman et al., 2006).

In addition, a similar pattern of moral reasoning was found in Dutch participants who judged killing someone as a side-effect of another action as more permissible than intentionally killing someone (Cima et al., 2010). Similar findings were reported in a study which used a Russian sample (Arutyunova et al., 2013) as well as a study which used a French sample (Tassy

et al., 2012). Furthermore, the judgment that killing someone as a side-effect of another action as more permissible than intentionally killing someone has also been shown in a non-Western sample. For example, it has been shown that Mayan individuals also judge killing someone as a side-effect of another action as more permissible than intentionally killing someone (Abarbanell & Hauser, 2010). In line with our study, these studies suggest that moral reasoning has universal aspects to it, and is most likely hardwired in the human brain.

However, while this study and most others have found the principle of double effect in their sample, one study reported that the Chinese did not seem to follow the principle of double effect (Ahlenius & Tännsjö, 2012). The researchers reported that the Chinese sample judged killing someone as a side-effect of another action as equally permissible as intentionally killing someone (Ahlenius & Tännsjö, 2012). A possible reason why this study did not find an effect may lie in its methodological shortcomings. For instance, the Chinese study used a two point answer format, rather than a 7-point Likert-type scale as was the case for this study and previous research. Scales with fewer points have a worse ability to detect the presence of significant differences if significance is present (Tredoux & Durrheim, 2012).

Therefore the fact that significant differences in moral judgement were not found between intended harm killings and foreseen harm killings for the Chinese could be attributed to differences in the answer format, rather than the Chinese possessing some unique quality. However, no research which used a 7-point Likert-type scale to assess the principle of double effect in a Chinese sample currently exists. Therefore it remains unclear if the principle of double effect was not followed in the Chinese sample because of differences in the Chinese population or differences in the answer format used.

False Belief Theory of Mind

All cultures also judged harm perpetrated due to a protagonist's false belief as equally forbidden. What this means is that all cultures thought that it was equally important to consider what the protagonist thought the outcome of their action would be when the outcome did not match the protagonist's intention. This finding suggests that there are no cross-cultural differences in moral reasoning as it shows that different cultures place equal emphasis on intention when making moral judgments. Given that this intention aspect of morality is a significant part the concept of moral reasoning (Young et al., 2007), and all four cultures put the same emphasis on it provides evidence that there are no differences in cross-cultural moral reasoning. It also supports the view that there is specific way of moral reasoning that is hardwired into the human brain.

ToM in relation to moral reasoning relates to both the degree to which one integrates type of harm when making moral judgments and the degree to which one integrates the outcome of an action in relation to a protagonist's intentions when making moral judgements (Young et al., 2007). There have been a many studies which have looked at differences in moral judgment between cultures for the first aspect (Cushman et al., 2006). However, despite the importance of the second aspect, there is a recognized shortage of research which has looked at the emphasis placed on moral judgments when a protagonist's intentions did not match the outcome (Young et al., 2007). As such there is an even greater dearth of research which looks at differences in emphasis placed on this aspect of ToM between cultures. That being said, this finding does support that different cultures place equal emphasis on intention when making a moral judgment. However, the idea that every culture places equal emphasis on the protagonist's intention cannot be too confidently stated given the scarcity of cross-cultural research which examined this aspect of ToM. This finding in combination with the cross-cultural presence of the principle of double

effect does suggest however, that there is a specific moral reasoning pattern that is hardwired into the brain

The Action Principle

The finding that suggests that there are cross-cultural differences in moral reasoning is that none of the cultures judged actively killing someone as less permissible than letting someone die. Black and White South Africans, as well as the English judged actively killing someone as equally permissible as letting someone die. Coloured South Africans judged actively killing someone as more permissible than letting someone die. Therefore none of the cultures followed the action principle and Coloured South Africans in fact showed the opposite of the action principle. This finding is not in line the prediction that participants would judge actively killing someone as less permissible than letting someone die nor is it in line with a host of other studies which have shown that people of different diverse populations followed the action principle (e.g. Cushman et al., 2006; Hauser et al., 2009; Schwitzgebel & Cushman, 2012).

A possible explanation for why the action principle was not followed by the cultures in this study is that the cognitive processes involved in judging scenarios related to the action principle are permeable to cultural influence. It is established that moral reasoning is not a natural kind and is not associated with a single brain area (Greene & Haidt, 2002). Rather, moral reasoning involves several different cognitive processes, many of which have different neural substrates (Greene & Haidt, 2002). Therefore a potential reason why there are cultural differences in judgements of action killings and omission killings, but not for other types of killings, is that different processes are involved for judging action and omission killings and these processes are influenced by cultural factors.

Such an explanation is plausible given that when action and omission killings are judged the dorsolateral prefrontal cortex (DLPFC) has been shown to be activated (Borg, Hynes, Van Horn, Grafton & Sinnott-Armstrong, 2006). However, when moral judgments are made for intentional killings, an increase in activity is commonly seen in the medial frontal gyrus and posterior cingulate cortex (Greene & Haidt, 2002). The DLPFC is implicated in conscious reasoning (Paxton & Greene, 2010). Therefore activation of the DLPFC when judging action and omission killings suggests that conscious reasoning is being applied when making those judgments. This could account for why not all cultures may follow the action principle. Because when conscious reasoning is being applied, participants may be applying different cultural rules when making moral judgments for these action killings and omission killings. Different cultural rules may dictate differences in the importance placed in the distinction between killing by action and killing by omission, resulting in the following, not following or the reversal of the action principal depending on that culture's mores. Further supporting that conscious reasoning is involved in the moral judgment of action killings and omission killings is that participants have been shown to have a greater ability to justify their action and omission judgments, relative to their moral judgment of intentional killings (Paxton & Greene, 2010).

However, if conscious reasoning can account for variability in cross-cultural moral reasoning for action killings and omission killings, what it is about Black and White South Africans, as well as the English that made them not abide by the action principle, and that made Coloured South Africans show the reverse. In terms of the English, their violation of the action principle was at odds with the majority of cross-cultural literature on moral reasoning. Research has shown that the action principle is very prevalent among Western cultures (Fraser & Hauser, 2010) therefore the English really should have conformed to it, however they did not. This could

potentially be accounted for by the fact that education levels were not recorded for the English sample. It has been shown that individuals with lower levels of education do not conform as strongly to the action principle (Banejeer et al., 2010). Therefore the potential presence of many uneducated English individuals within the English sample may explain why they are not conforming to the action principle. However, such an explanation cannot account for why the action principle was not followed by South Africans given that the entire sample consisted of university students.

For the Black South Africans, it must be noted that the Black South Africans only violated the action principle after Bonferonni correction was applied. Therefore, interpretation for this sample is more tentative. However, assuming Black South Africans did not follow the action principle, this may be accounted by the fact that many Black South Africans are culturally African (Eagle, 2005). African cultures tend to be collectivist in nature as opposed to individualistic like Western cultures (Woods & Jagers, 2003). Collectivistic cultures conceptualize the concept of 'the self' in terms of other people whereas individualistic cultures have a more independent notion of the self (Woods & Jagers, 2003). Whether an individual is a part of collectivistic or individualistic culture may influence an individual's moral judgments (Woods & Jagers, 2003).

Therefore the moral judgments made by Black South Africans that killing by an action and killing by omission are similar may be because both instances result in the death of a part of themselves. Given that their conceptualization of the self is defined in relation to others and the person the protagonist kills is another person, killing them would be more similar to killing a part of themselves than it would be for an individual who is Western in culture. However, for individualistic cultures where individuals would likely see the protagonist as a separate entity as

the person they kill, there would be more of a difference in whether the protagonist actively kills the individual or whether the protagonist lets them die. This may potentially account for why the action principle is followed in many individualistic cultures, but may not be followed by Black South Africans, many of whom are African in culture.

Another potential explanation as to why Black South Africans did not abide by the action principle is that African cultures place more emphasis on omissions in general (Eagle, 2005). In many African cultures it is believed that the presence of bad life events is a result of not doing certain practices, such as not doing specific rituals to honour their ancestors. (Eagle, 2005). These bad life events are often framed as punishment by the ancestors as a result of these omissions (Eagle, 2005). Therefore omissions play a big role in African culture. Western cultures however, do not hold such beliefs which may explain why they tend to judge actions worse than omissions, whereas African cultures who place a larger emphasis on omissions, and in turn many Black South Africans, view actions and omissions as less distinct.

Why White South Africans did not abide by the action principle and why Coloured South Africans showed the opposite of the action principle is more difficult to provide potential explanations for. This is because both the lived experience of White South Africans and most Western cultures have similarities in terms of having access to the best possible resources, as opposed relative to oppressed races. Furthermore it has been shown that White South Africans mirror Western cultures in their development of moral reasoning based on Kohlbergs's Stages of Moral Development (Ferns & Thom, 2001) therefore this violation of the action principle is an oddity. What does separate White South Africans from Westerners and therefore may explain the violation is that many White South Africans are Afrikaner in culture (Dyers, 2008). Therefore the Afrikaner aspect of White South African culture could potentially contain within it certain

dynamics which accounts for why White South Africans in this study violated the action principle.

In terms the Coloured South Africans, there has been much research where participants followed the action principle (e.g. Banerjee et al., 2010; Hauser et al., 2009; Schwitzgebel & Cushman, 2012) and some research which have shown it being violated (e.g. Abarbanell & Hauser, 2010). However, there has been no research which has shown the action principle being reversed, as is the case in this study. Therefore Coloured South Africans violating the action principle is difficult to account for. However, one possible explanation could be that the Coloured South African sample contained a far greater proportion of Muslim individuals than the Black and White South African, and the English sample. It has been said before that religious affiliation affects moral judgment (Woods & Jagers, 2003). Therefore a greater proportion of Muslims within the Coloured South African sample may account for the reversal of the action principle. This greater proportion of Muslims in the Coloured South African sample is slightly more likely given that in the Western Cape, the province where the participants were recruited from, the ratio between Muslims who are Coloured and Muslims who are White and Black is far greater than in any other South African province (Vahed, 2007). However, these explanations for the White and Coloured South Africans are just speculation and would require further research to assess their validity.

In addition to the above, the finding that the cultures in this study did follow the action principle also suggests that the reason why cross-cultural differences in moral reasoning were found in certain studies and not others was not because the former only assessed abstract reasoning and ToM, as was earlier suggested. There have been studies which have found differences in moral reasoning between cultures (e.g. Haidt & Graham, 2007). However, these

studies focused predominantly on aspects of moral reasoning unrelated to personal harm and only found differences in moral reasoning for those aspects (social hierarchy, purity, reciprocity and in-group) (e.g. Haidt et al., 1993). Contrast this with studies which found no-cross cultural differences in moral reasoning which use trolley problems and focused on harm (i.e. someone dying in the scenarios) (e.g. Arutyunova et al., 2013; Banerjee et al., 2010).

It was suggested that studies which found cross-cultural differences did so because their scenarios did not contain a death and therefore did not activate emotional processes within participants. However, in trolley problem studies which contained an emotional component, by virtue of having scenarios where someone died, resulted in the activation of emotional processes, leading to all participants providing the same response pattern, regardless of their culture. However, this study used trolley problems, which assessed the emotional aspect of moral reasoning, yet still found cross-cultural differences in the judgments for action killings and omission killings. This suggests that it is not the addition of an emotional component which account for discrepancy in findings for studies which use different operationalizations of moral reasoning but rather something else.

Limitations

One of the limitations of this study relates to differences in the English and South African sample, excluding culture, which may have influenced the results and in turn the conclusions. The first difference was in recruitment method, with South Africans being recruited through a university's internal online network whereas the English were recruited through posted advertisements. Therefore differences in moral reasoning may reflect differences in recruitment method rather than differences in culture. Furthermore, the fact that the English were recruited through posted advertisements means that there may have been a self-selection bias within the

English sample. This may have resulted in the English sample consisting solely of participants who moral reason in a specific way which may have influenced the results. However, while the aforementioned may have influenced results, studies which have used different recruitment methods have shown the presence of both the principles (e.g. Banerjee et al., 2010; Tassy et al., 2012) suggesting that recruitment methods do not influence significantly influence moral reasoning. In addition, the results of studies which have used volunteers, and therefore may also have a self-selection bias as well, have not been different from other studies which used recruitment methods that could not have had a self-selection bias (e.g. Schwitzgebel & Cushman, 2012; Tassy et al., 2012). This suggests that the potential self-selection bias in the English sample is unlikely to have significantly influenced the results.

Another limitation which stems from differences between the South African and English sample is that the data used in this study was collected in different years. The South African data was collected in 2015 and the English data was collected in 2007. Therefore cross-cultural differences in moral reasoning may be attributed to historical events which occurred in South Africa between 2008 and 2015, rather than differences in culture. However, it could be argued that historical events cannot and should not be separated from the culture; because it is precisely those events which make one culture distinct from other cultures e.g. South Africa's historical event of apartheid played a big role making Black culture distinct from Coloured culture and Coloured culture from White culture etc. Therefore the fact that the data was collected in different years does not influence the validity of the results. In terms of the South African sample, one of the limitations was that this study did not control for age which could have weakened the ability to generalize the results to the South African population. In terms of this study's ability to generalize the results to the South African population, this may be hindered by the fact that it

was unlikely that the sample was representative in terms of age, given the sample was solely undergraduate students. Therefore the results may not apply to South African populations of different ages. While this is possible it has been demonstrated that age is not an important variable in explaining the presence of the principle of double effect (Fraser & Hauser, 2010). It has been shown that has shown that individuals from 20 to 60 years of age demonstrate the presence of the principle of double effect (Fraser & Hauser, 2010). Therefore it is likely that results could be generalized to other South African populations of different ages. However, studies which have looked whether the principle of double effect is followed at different ages within the South African population have not been done. Therefore it cannot be said for sure that the above applies.

Another limitation was the manner in which culture was operationalized. In this study, culture was operationalized on the basis of nationality and/or race. If a different operational definition of culture was used the findings may have been different. For example, it has been shown that type of communal orientation, religious affiliation and level of religiousness may affect moral reasoning (Woods & Jagers, 2003). Therefore an operationalization which explicitly included these variables may have resulted in different findings. However, it is believed that given the cultural hemogeneity in England (Fearon, 2003) and South Africa's history of apartheid that nationality and/or race were valid means do determine culture given this study's sample.

The last limitation is that this study did not contain every culture possible. Therefore it cannot be said that on the basis of these findings that there a no cross-cultural differences in certain aspects of moral reasoning. There may be other cultures which differ from the results found in this study. However, it is clearly not possible to include all these different cultures due

to a lack of resources. Moreover, the cultures used in this study were the ones which are likely to be most distinct in South Africa given the apartheid classification system separated people in terms of these three cultures. Therefore it is believed that if there were no differences in these distinct cultures, than it is strong evidence that the same may be the case for other cultures.

Significance of Study and Suggestions for Future Research

It was hypothesized in this study that given results from research which has used trolley problems (Sachdeva et al., 2011) as well as neuroimgaery (Greene & Haidt, 2002) and neuroanatomical research (Thomas et al., 2011) there is likely to be no cross-cultural differences in moral reasoning. This study hypothesis was not confirmed, but rather that certain aspects of moral reasoning appeared to be impermeable to moral reasoning, while other aspects seemed to be influenced by culture. There is an increasing demand for neuropsychological screening batteries for socio-cognitive processes, such as moral reasoning, which operate under the assumption of universality. Therefore it is important to know whether these screenings are culturally valid. This study has shown that neuropsychological batteries could use intended, foreseen harm and potentially false-belief theory of mind scenarios to assess neurological functioning. However tests and screens which incorporate action and omission scenarios would have to be culturally sensitized or not used at all.

In terms of suggestion for future research the most interesting findings were that White and Black South Africans as well as the English did not follow the action principle as expected, and that Coloured South Africans displayed the opposite of the action principle. Therefore, a study with a bigger sample could be used in an attempt to replicate these findings. In addition, such a study could also control for education levels between all groups as well record participants' home language and religious affiliation to see if Afrikaner culture and being

Muslim has an influence on whether the action principle is followed. Lastly more cross-cultural research needs to look at false-belief theory of mind scenarios. There is a dearth of research which looks at moral judgment when the outcome does not meet the protagonist's expectation and given that this is an important aspect of moral reasoning that needs to be further researched.

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Appendix A

Example of the informed consent form used in this study.

THE MORAL SENSE TEST

Instructions

Before you begin, it is important that you read the information on this page. It describes the test and informs you about your rights as the participant.

The Moral Sense Test (MST) is an attempt to conduct basic research into human moral psychology. We hope to characterize the psychological process that leads individuals to make judgments about what is right and what is wrong. Furthermore, this study may be beneficial to you by providing you with knowledge regarding your own moral reasoning. If you are interested in learning more about your moral reasoning you can contact the researcher or the researcher's supervisor regarding your results. The contact information for both the researcher and their supervisor can be found below.

The MST asks you to answer questions about hypothetical scenarios. The answers are kept strictly confidential.

Please assume that all information in the scenarios are true, and do not make any initial assumptions. Even if the information in the scenarios seems unreasonable, please do your best to accept the information provided and answer truthfully.

The test comprises of four blocks of scenarios. Each block takes about 15 minutes to complete. Please work continuously though a single block. You may stop participating at any time if you do not wish to continue and will not be penalized in anyway. However, in order to get your course credits/SRPP points you are required to complete the test in its entirety.

If you have checked "Yes" above, please turn the page.

Contact Information

Any study-related questions, problems or emergencies can be directed to the following:

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I have been informed of my rights as a participant and wish to participate in this study?

☐ Yes

☐ No

Appendix B

Example of the demographic questionnaire used in this study

What course would you like your SRPP point to be allocated to?

☐PSY1005S (Introduction to Psychology Part 2)

☐PSY2010S (Cognition and Neuroscience)

☐PSY3007S (Research in Psychology 2)

☐PSY3010 (Introduction to Clinical Neuropsychology)

Have you ever experienced a traumatic brain injury?

☐Yes ☐ No

Have you ever been diagnosed with a neurological and/or mental disorder(s)?

☐Yes ☐ No

If you selected "yes" to either or both question 3 or 4 you are unfortunately ineligible to participate in this study. This is because traumatic brain injury, neurological disorders and mental disorders can influence an individual's theory of mind and moral emotions, two essential components in what this questionnaire attempts to measure (i.e. moral reasoning).

It is generally accepted that the decision to include or exclude individuals from participating in a study depends on the focus, objective, nature of research and context in which the research is conducted. Some research may be focused on a certain individual (such as in a person’s life history), or a group of individuals who share a specific characteristic (e.g. an identifiable group of asthma sufferers who happen to be all of one sex; a religious order that is restricted to one sex). Other examples include research that is focused on specific cultural traditions or languages,

or on one age group (e.g., a study of posture corrections in adolescents). These are regarded as appropriate forms of inclusion and exclusion of individuals or groups in research studies - so long as the selection criteria for those to be included in the research are relevant to answering the research question.

What is your student number? :

What race do you self-identity as?:

What is your self-identified nationality?:

Acknowledgments

I would just like to use this part to acknowledge those who helped me produce my thesis. By far the biggest contributor to my thesis was my supervisor Dr. Progress Njomboro and his contributions were invaluable. He was involved in providing me with the data I used for the English sample as well as cleaning it to make sure it fit certain age specifications. More importantly, he offered detailed feedback regarding what could be included, excluded and elaborated upon for every section of my thesis so that I could improve it. Without his help thesis would have undoubtedly been a mess. In addition, I would like to thank Dr. Colin Tredoux who made himself available to answer several questions I had about my data analysis.

If anyone who reads this is further interested in any aspect of this study they can contact me at jspsas001@myuct.ac.za

PLAGIARISM DECLARATION

PLAGIARISM

This means that you present substantial portions or elements of another's work, ideas or data as your own, even if the original author is cited occasionally. A signed photocopy or other copy of the Declaration below must accompany every piece of work that you hand in.

DECLARATION

1. I know that Plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

2. I have used the American Psychological Association formatting for citation and referencing. Each significant contribution to, and quotation in, this essay/report/project from the work or works, of other people has been attributed, cited and referenced.

3. This essay/report/project is my own work.

4. I have not allowed, and will not allow anyone to copy my work with the intention of passing it off as his or her own work.

SIGNATURE: Sasha Joseph