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Using the Implicit Relational Assessment Procedure (IRAP): Implicit Attitudes and Materialism

A thesis
submitted in partial fulfilment
of the requirements for the degree
of
Masters of Applied Psychology (Behaviour Analysis)
at
The University of Waikato
by
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THE UNIVERSITY OF
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Te Whare Wānanga o Waikato

2016

Abstract

Advertising may reinforce brief and immediate relational responses (BIRRS) of correspondence between “happiness” and “material wealth.” My research looked into the possibility of changing BIRRs associated with materialism through 10 minutes of training prior to taking the IRAP. I hypothesised that participants can become more or less materialistic through reinforcement of materialistic or anti-materialistic relational responding. Eighty-four participants were assigned to one of three groups, Materialistic, Anti-Materialistic, or Control, and received relevant training followed by an Implicit Relational Assessment Procedure (IRAP) and Materials Value Scale (MVS) survey. The IRAP was used to measure response latencies when individuals responded to pairs of stimuli consistent (e.g., happy/luxury) or inconsistent (e.g., happy/cheap) with materialistic attitudes. The MVS is a survey intended to measure materialism. Results showed that participants were faster to respond materialistically than they were to respond anti-materialistically, regardless of the type of training that they received. Regression analysis showed that participants who completed more Anti-Materialistic training blocks were predicted to score higher on the MVS. I concluded that, 10 minutes of training was not sufficient to affect BIRRs associated with materialism. Moreover, the results indicate that the relational network associated with “being materialistic” is complex and that there is not a clear “opposite” of materialism.

Experiment 2 was a focus group, designed to investigate participant’s thoughts regarding the stimuli used in Experiment 1. Participants from Experiment 1 were invited back for focus group sessions. The key findings from the focus group was that the stimuli used in Experiment 1 was not fully reflective of Anti-Materialism and the lack of context during the IRAP compounded into a different interpretation

of “Anti-Materialism” for the participants. There is more to Anti-Materialism than the direct opposite of Materialism.

Acknowledgements

This thesis would not have been possible without the support of some key figures. First and foremost, I would like to thank my supervisors Dr Timothy Edwards and Dr Rebecca Sargisson for their support, critical insights, timely comments, and plenty of proofreading to shaping this thesis into something legible. This has been an incredible journey of learning the small nuances of the English language, academic writing, and research. I would also like to acknowledge the financial, and technical support of the University of Waikato.

To my friends, for their support and encouragement throughout this journey. A big thanks to Joseph Graddy for his ideas and tutelage into the world of IRAP, BIRRs, EERRs, and RFT in general. RFT buddies for life!

To the love of my life, Boon Mong Na, for the care, patience, and delicious meals. Her quick cooking tips enable me to be an amateur chef and whip up some form of palatable food in times of need.

Lastly, I extend my appreciation and gratitude to my family. My father, Vincent, for the opportunity to pursue this Master's degree overseas, to my mother, Shirley, and my brother, Shaun, for the moral support.

Table of Contents

Abstract	ii
Acknowledgements.....	iv
Table of Contents	v
Figures.....	vii
Tables.....	vii
Appendix.....	viii
General Introduction	1
Implicit Attitudes.....	1
IAT	7
IRAP.....	8
Comparison: Why IRAP and not the IAT	10
Materialism.....	14
Experiment 1.....	17
Method	20
Participants.....	20
Apparatus	20
Design.....	21
Procedure.....	22
Results.....	25
Data Processing.....	25
Pass Rates.....	26
Split Half Reliability	26
Trial type analysis	26
ANOVA	29
Regression	32
Discussion	34
Materialistic Group	35
Anti-Materialistic Group	36
Control Group	36
Attrition Rate.....	38
Regression	39
Limitations, Future Research, and Conclusions.....	40
Experiment 2.....	42
Thematic Analysis.....	42

What is a Theme?	44
Method	45
Participants	45
Ethical consideration	45
Procedure	45
Findings/Discussion	46
The stimuli used do reflect Materialism	46
The stimuli used do not reflect Anti-Materialism	47
Replacement of words that might reflect anti-materialism	50
Happy works but not sad for the stimuli used	53
MET training effects are too short	54
Awareness	54
Conclusion	56
General Discussion	57
References	58

Lists of Figures and Tables

Figures

1.1 Screen presentation of IAT.....	7
1.2 Screen presentation of IRAP.....	9
1.3 IRAP results from Barnes-Holmes et al. (2010)	12
1.4 Schematic diagram of Experiment 1.....	24
1.5 Mean D-IRAP scores from Experiment 1.....	29
1.6 Interaction plot from three-way ANOVA.....	31

Tables

1.1 IRAP stimuli used in Experiment 1.....	20
1.2 D-IRAP score calculation steps.....	25
1.3 One sample t-tests results from Experiment 1.....	27
1.4 Three-Way ANOVA results from Experiment 1.....	30
1.5 Estimated Marginal Means Sample.....	30
1.6 Estimated Marginal Means Target.....	31
1.7 Descriptive stats Total MVS.....	32
1.8 One-Way ANOVA of Total MVS.....	32
1.9 Regression results from Experiment 1.....	33
2.1 Phases of Thematic Analysis.....	43

List of Appendix

Appendix

A: Participant Information Sheet68

B: Consent Form70

C: Experimenter Script.....71

D: Materials Value Scale75

E: Focus Group Prompts.....77

General Introduction

Implicit Attitudes

Implicit attitudes can be defined as “introspectively unidentified (or inaccurately identified) traces of past experience that mediate favourable or unfavourable feeling, thought, or action toward social objects” (Greenwald & Banaji, 1995, p.8). As an example, imagine a child who gave a comment in the supermarket, “Mom, why is that man’s skin so black?” The mother then tells the child to respect other people and not say such things in public. This could be the beginning of teaching the child about racism or racial diversity, depending on how the parents answer the question “Why is that man so black?” Over the course of that child’s life, multiple messages by the community would either reinforce speaking out about differences in skin colour or accepting that everybody has different skin tone and that what they contribute to society as a whole is more important. When this child is asked about how racist they are on a questionnaire, they might answer that they are not racist and that they accept people of different skin colour. However, the same person might be observed to actively avoid people that are not of similar skin colour to themselves. Asking the child whether they are racist is a form of measuring their explicit attitudes as they can answer “no” or allude to answers that do not reflect racism. The implicit attitude can be observed through the child’s behaviour of actively avoiding people of different skin colour, even without the child’s conscious knowledge of their own avoidance behaviour.

Researchers are rarely able to observe and scrutinize the behaviour of people in order to discover their “implicit attitudes”, thus computer programs have been developed to measure implicit attitudes, which are suggested to be the quickest response a person will make when tested under pressure. These programs are designed under the assumption that people are capable of responding more quickly

to relations that correspond with their implicit attitudes. For example, if when asking the child to quickly respond to whether “Black skinned” is “Good” or “Bad” the child is faster to respond “Bad” than “Good”, that should predict the child’s behaviour of “avoiding people of different skin colour”. These implicit attitudes have been shown to be a better predictor of behavioural outcomes than explicit measures such as self-report or questionnaires (Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Nosek, Greenwald, & Banaji, 2007).

Several studies have shown that people tend to behave differently than what they *report* in regards to their own behaviours (Castle, Handler, & Wagner, 2016; Corral-Verdugo, 1997; Jenner et al., 2006; Prince et al., 2008). Thus, the predictive validity of self-report measures of explicit attitudes and behaviour is quite low (Greenwald et al., 2009; Kraus, 1995). People tend to report their attitudes and behaviours in explicit measures which are not predictive of their own actual behaviours which potentially reflect their implicit attitudes. For example, Jenner et al. (2006), observed healthcare professionals in hospital wards practicing hand hygiene and compared that with questionnaires that the same healthcare professionals completed on their self-reported behaviour of hand washing. Their results showed that, while the hospital staff self-reported that they did practice proper hand hygiene, the actual observations of the staff performing hand hygiene practices was low. This shows that explicit measures of behaviour like self-reports or questionnaires do not reflect actual behaviour and therefore it is hard to predict behaviour using explicit measures alone.

Greenwald et al. (2009) have recommended using the Implicit Association Test (IAT; described below) together with self-report measures to better predict behaviour. In other words, a combined IAT and explicit measure with a high correlation serves as a better predictor of behaviour than using an explicit measure

alone. A few studies have shown that IAT scores and explicit measure scores correlate highly on certain topics, such as measuring prejudice based on religious ethnicity (Jewish vs Christian), age (young vs old), and nationality (American vs Soviet; Rudman, Greenwald, Mellott, & Schwartz, 1999), anxiety (Egloff & Schmukle, 2002), or self-esteem and self-concept (Greenwald & Farnham, 2000). It has also been shown that implicit measures are better predictors of behaviour than explicit measures when it comes to attitudes rated as ‘socially sensitive’. Socially sensitive topics are those that bring up “concerns about the impression that the response would make on others when self-reporting on constructs which are not talked about explicitly in public” (Greenwald et al., 2009, p.20). To put it behaviourally, it means that topics that are likely to be punished by the verbal community, for example, attitudes on race or ethnicity fall into the realm of socially sensitive topics, and, on these topics, explicit measures do not predict behaviour accurately because participants will answer so as not to provoke a judgemental response from the people around them while doing the self-report. Snowden, Wichter and Gray (2007) used the IAT to predict sexual orientation with homosexual and heterosexual men. Participants took the IAT as the implicit measure, followed by the Feeling thermometer and semantic differential as explicit measures, which were Likert scales asking the participants to rate their feelings towards homosexual or heterosexual concepts. Sexual orientation measures had always been previously dependent on self-report, but Snowden et al. showed a high correlation between IAT and the explicit measures. The conclusion was that the high correlation between IAT scores and the explicit measures showed that IAT was a viable tool to be used as a predictor for sexual orientation and erotic preference. Snowden et al.’s study demonstrates the IAT scores as a good predictor of behaviour

when explicit measures do not, this is still weak evidence for using implicit scores as predictors of behaviours.

The measures of implicit attitudes rely on language, and behaviour to expresses those attitudes, which is a form of verbal behaviour. Relational Frame Theory (RFT) is a functional, behaviour-analytic approach to understanding human language and cognition (Hayes, Barnes-Holmes, & Roche, 2001). RFT focuses on stimulus equivalence and derived stimulus relations (Hayes et al., 2001), which can be taught. For example, teaching an A-B relation, a B-A relation will be derived. Further, teaching a B-C relation, three new derived relations will occur, C-B, A-C, and C-A. Imagine a child was shown a red fruit (A) and then given the letters that spelled out A-P-P-L-E (B), the child will then have learned that the ‘red fruit’ is spelled out as APPLE (A-B relation) and that APPLE is the ‘red fruit’ (B-A relation). To build onto that, the word APPLE (B) is pronounced as ‘ap-pel’ (C), the child will have learned the pronunciation of the word APPLE and APPLE sounds like ‘ap-pel’ (B-C and C-B relation). From there, the child can now derive that the ‘red fruit’ is called an ‘ap-pel’ and ‘ap-pel’ is the ‘red fruit’ (A-C and C-A relation) without having to directly teach the child these relations. Stimulus equivalence is a behavioural description of an organism learning to respond to untrained stimuli based on deriving relations from previous learning history. RFT treats stimulus equivalence as a generalised operant (D. Barnes-Holmes & Barnes-Holmes, 2000; Hayes et al., 2001). To put it simply, if a person derives the relation that “Muslims” is the same as “bad”, the behaviour will now change to avoid people, such as walking away or walking to increase the gap between people that fit the idea of “Muslim”, such as people wearing turbans, have bushy beards, and follow Islam as a religion because they are “bad” people.

RFT theorists explain “attitude” as a kind of relational response that is under the control of previous history of reinforcement and certain contextual cues. What this means is that an organism will react towards a stimulus based on the relation the organism has with the stimulus. An example of this is selecting “good” when presented with words such as “white” and “Caucasian” which demonstrates a pro-white attitude and “bad” with words such as “black” and “African”, demonstrating an anti-black attitude. These relations can be seen explicitly through the behaviour of avoiding black skinned individuals and more accepting behaviour towards white-skinned individuals. The behaviours can be accounted for through the Relational Elaboration and Coherence (REC) model (D. Barnes-Holmes, Barnes-Holmes, Stewart, & Boles, 2010; Hughes & Barnes-Holmes, 2013).

The REC model explains how implicit relations and the explicit response come together through brief and immediate relational responses (BIRRs) and extended and elaborated relational responses (EERRs). As an example, imagine that you are in a meeting and your phone buzzes, you are about to reach for it like you usually do, but you stop midway because you remember you are in a meeting. What has occurred here, as explained through RFT lens is that, given the stimulus of your buzzing phone, the reaction of reaching out and checking what is on it (BIRR) has not *cohered* with the rule of ‘no phones during the meeting’ (EERRs). In the next few seconds of reaching out towards your pocket, other relational responding (EERRs) is occurring until coherence is achieved and thus, in the context of the meeting, you stop reaching out for the phone. If coherence has not been achieved, you would continue with the behaviour and check your phone and your colleagues will shoot disgusted or puzzled looks your way for your behaviour. To put it simply, BIRR is the ‘impulsive’ or ‘first reaction’ towards a stimuli, after a few moments have passed, if there is coherence, EERRs take over and a behaviour can stop or

change mid-way. The verbal community is constantly reinforcing coherence (and incoherence is punished), thus, achieving coherence becomes a type of conditioned reinforcer for language capable users (Hughes & Barnes-Holmes, 2013). Like any other behaviour, relational responding occurs across time as well (Hughes & Barnes-Holmes, 2013), with BIRRs occurring in the first few seconds and the EERR occurring across longer periods. With that in mind, the REC model proposes that for implicit measures, the short latency is targeting the BIRRs and a longer latency in explicit measures are targeting the EERRs. When BIRRs cohere with EERRs, the REC model predicts no divergence, and divergence when they do not cohere.

To explain divergence, consider the socially sensitive attitude towards the word ‘Muslim’. The word ‘Muslim’ is often reported in media with words of negative connotation, such as ‘terrorist’, ‘extremist’, and ‘dangerous’. From the RFT perspective, these words presented in a pair with ‘Muslim’ creates an equivalence relation whereby ‘Muslim’ is the SAME as ‘extremist’, ‘terrorist’ and ‘dangerous’. Implicit attitude researchers have found BIRRs consistent with anti-Muslim sentiment (Anderson & Koc, 2015; Gonsalkorale, Hippel, Sherman, & Klauer, 2009; Park, Felix, & Lee, 2007; Rowatt, Franklin, & Cotton, 2005). The verbal community will often reinforce positive verbal behaviours such as ‘treat everybody as equals’ or ‘do not judge others’. However, with the media creating networks that ‘Muslim’ is the SAME as ‘terrorist’, when tested, the BIRRs do not cohere with previous verbal behaviours, the EERRs, and therefore diverge from the ‘everybody is equal’ relation. When the participants are given time to respond (in explicit measures), they are more likely to produce a response that does not reflect anti-Muslim sentiments.

There have been a few methods that are designed to measure these implicit relations. Previously, the most used method was the *Implicit Association Test* (IAT; Greenwald, McGhee, & Schwartz, 1998). Recently, there is a new method of

measuring these implicit beliefs and attitudes, using the *Implicit Relational Assessment Procedure* (IRAP; Power, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009)

IAT

The IAT measures the association of concepts with an attribute. This is done through having the participants sort words that are presented one at a time, into two response options, as quickly as possible. The words used in IAT usually have relatively uniform evaluative association across subjects (e.g., good, bad) and words that relate to the attitude in question. To illustrate, take the seminal IAT study by Greenwald et al. (1998) who investigated attitudes towards pairs of target attitude concepts. Participants were presented with flower names (e.g., rose, tulip, marigold) versus insects (e.g., bee, wasp, horsefly) and were to pair them with target-concept discriminative words of pleasant (e.g., family, happy, peace) or unpleasant (e.g., crash, rotten, ugly). Figure 1.1 shows an example of two potential screen presentation that the participant might see.

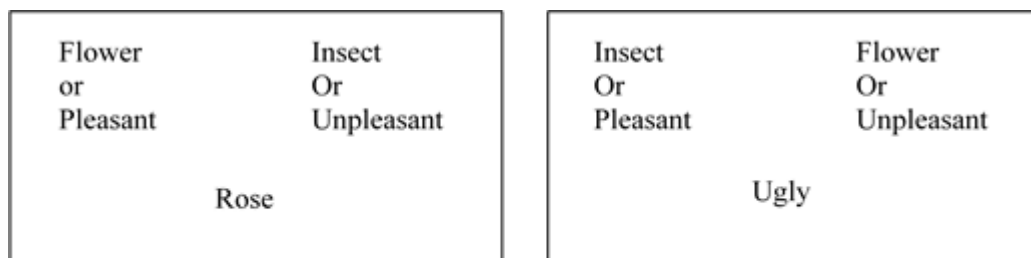


Figure 1.1. Two possible screen presentations of as IAT.

Participants were instructed to press ‘e’ to sort the term to the left, or ‘i’ to sort the term to the right. Response latencies are measured in both conditions; in the first condition, the response option shows a compatible combination, flower + pleasant or insect + unpleasant. The second condition shows an incompatible combination, insect + pleasant or flower + unpleasant. The difference in the mean response latencies in both conditions is assumed to be indicative of which category

is more positively evaluated. In most IAT studies, the difference in response latencies are transformed using Greenwald, Nosek, and Banaji's, (2003) D-score algorithm to account for individual differences.

The differences in the scores paint a picture of the participant's implicit attitude. To put in another way, if the participant responds faster in the compatible combination, than in the incompatible combination, it is assumed that the participant's attitude towards flowers is more positive than it is towards insects. This means that we could predict that, when given a choice between a flower and an insect, the participant is more likely to choose the flower given the participant's positive attitude towards flowers.

IRAP

The Implicit Relational Assessment Procedure (IRAP) was designed to directly measure implicit beliefs (D. Barnes-Holmes et al., 2006) through recording a participant's reaction time to respond accurately to textual stimuli on the computer screen.. Figure 1.2 shows four possible screen presentations from the first IRAP study by Barnes-Holmes et al. (2006). Participants were presented with a sample stimulus (e.g., pleasant or unpleasant) at the top of the screen, followed by a target word that is deemed either pleasant (e.g., love) or unpleasant (e.g., sickness) in the middle, and two response options at the bottom that are either consistent or inconsistent with the target word.

Participants were instructed to press 'd' for the term on the left or 'k' for the term on the right. Choosing the correct relational term removes the stimuli from the screen for 400ms before the next trial. Choosing the wrong relational term would result in a red X in the middle of the screen and the trial would not end until the participant chose the right term. In an IRAP trial, two sample stimuli (i.e. Pleasant or Unpleasant) and 12 target words (i.e. caress, freedom, health, love, peace, cheer,

abuse, crash, filth, murder, sickness, accident) are randomly paired so that each word appears twice, once with ‘Pleasant’ and once with “Unpleasant”, producing 24 trials per block. Participants complete up to eight practice blocks to achieve the accuracy and response speed criteria. Once those criteria are met, participants will complete six test blocks. On half of those test blocks, participants are required to respond consistent with pre-experimentally established relations and in the other half, participants are to respond inconsistently with those relations.

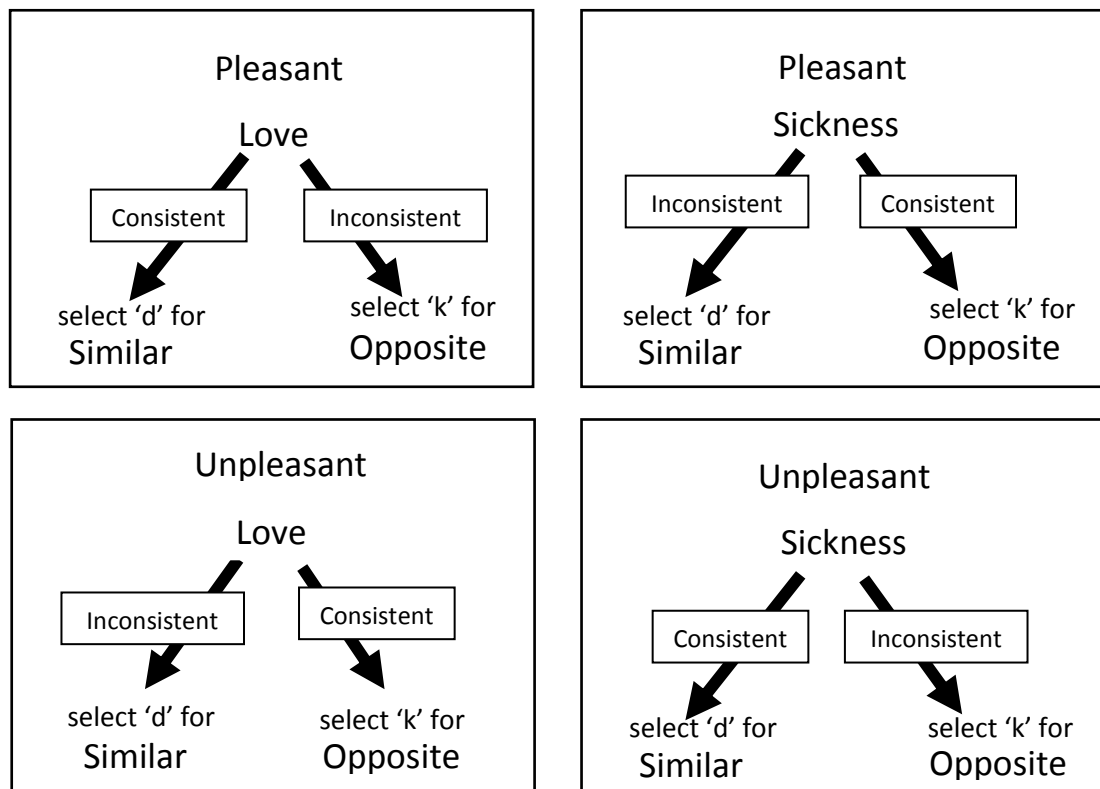


Figure 1.2. Four possible screen presentations of the first IRAP used by Barnes-Holmes et al. (2006) showing the four trial types. The ‘consistent’ and ‘inconsistent’ labels show the pre-experimentally established relations and are not visible to the participants.

Each consistent and inconsistent block is paired to create three block-pairs. In each block, instructions are provided at the start. Instructions on the consistent block would be “Please respond AS IF pleasant and love are similar”. Using Figure 1.2 as an example, in the *consistent* block, participants need to choose ‘similar’ when they see “Pleasant” is presented with “Love” or ‘opposite’ when “Pleasant” is presented with “Sickness”. In the *inconsistent* block, the instruction given would be

“Please respond AS IF pleasant and love are opposite”; participants would now be required to choose ‘opposite’ when presented “Pleasant” with “Love” or ‘similar’ when presented “Pleasant” with “Sickness”.

The time from stimulus presentation to the first correct response is referred to as the response latency. The response latencies from the consistent block are compared with the response latencies from the inconsistent block. This difference in response latencies is transformed using an adaptation of Greenwald et al.’s (2003) D-score algorithm in order to minimise effects from individual differences in reaction time. When this difference between the mean response latency is significantly different from zero, it is termed the *IRAP effect*. To put it simply, IRAP effect is based on the brief and immediate relational responding which becomes apparent when the behavioural system is put under pressure to respond quickly and accurately (D. Barnes-Holmes, Barnes-Holmes, et al., 2010). In other words, the IRAP is measuring the response latency when the participant is put under a time pressure to respond quickly and accurately.

Comparison: Why IRAP and not the IAT

So far, I have briefly explained the procedure for IAT and IRAP and both programs were designed to measure response latency. The IRAP provides a more detailed assessment of relational terms towards an object (e.g., SIMILAR, OPPOSITE, MORE THAN, LESS THAN, D. Barnes-Holmes et al., 2006), while the IAT provides a relative measure towards an attitude, which is not a good prediction of behaviour. Knowing that the IAT only tells us the relative strength of the associations between stimuli (Hughes & Barnes-Holmes, 2013), we cannot accurately predict how the participant would respond in the presence of the stimuli in question. For example, imagine the situation of using the IAT to compare spiders with snakes. The IAT might show that the participants respond more positively

towards snakes than spiders, meaning that participants would rather avoid a spider than a snake. However, should the event become a reality, and the participant encounters a spider and a snake, the participant would most likely avoid both. This situation brings up some limitations with the IAT; firstly, the IAT can only predict behaviour in a specific event, when both stimuli are present, to avoid a spider or a snake. Secondly, if the event really occurs, the IAT cannot determine if the participant would rather choose to avoid or approach the stimuli. The IRAP however could detect whether spiders elicit a positive/negative bias and if snakes elicit a positive/negative bias. This amount of detail, based off the D-IRAP score would give a better prediction of behaviour, whether the participant would avoid one or the other, or both.

To show this difference between IAT and IRAP, take one study by Barnes-Holmes, Murtagh, Barnes-Holmes and Stewart (2010), who used IAT and IRAP scores to assess the attitudes of vegetarians and non-vegetarians towards meat and vegetables. In the IAT, participants were presented images of meat (e.g., bacon), or vegetables (e.g., cabbage) and asked to pair it the images either a positive object (e.g., smiling baby), or a negative object (e.g., crying baby). Participants were given either the Meat + Positive IAT, where participants were to categorize meat with positive images and vegetables with negative images, or the Vegetable + Positive IAT which is the opposite. In the IRAP, participants were required to respond either 'true' or 'false' when presented with the image of meat (e.g., bacon) or vegetable (e.g., broccoli) paired with the words 'Pleasant' or 'Unpleasant'. In the pro-vegetable to pro-meat sequence, participants are to respond *True* to *Pleasant-Vegetable* and *Unpleasant-Meat*, or *False* to *Unpleasant-Vegetable* and *Pleasant-Meat*. In the Pro-meat to pro-vegetable sequence, participants are to respond the opposite to the pro-vegetable to pro-meat sequence. Figure 1.3 shows the results

from Barnes-Holmes et al.'s (2010) study, with the IRAP results on the left panel, and the IAT results on the right panel.

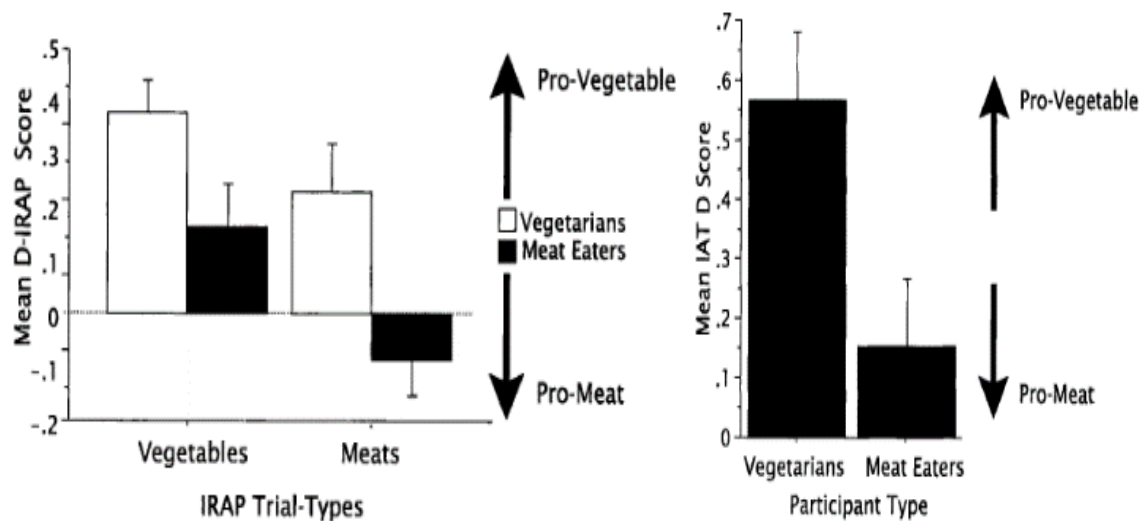


Figure 1.3. Results of an IRAP (left) and an IAT (right) designed to measure attitudes towards vegetable and meat from Barnes-Holmes et al. (2010). For the IRAP, positive D-IRAP scores reflect a pro-vegetable bias and a negative D-IRAP score reflect a pro-meat bias. A pro-vegetable bias means that participants would be quicker to press “True” to ‘Pleasant-Vegetable’ and “Unpleasant-Meat” and “False” to “Pleasant-Meat” and “Unpleasant-Vegetable”. A pro-meat bias means participants were quicker to respond in the opposite pattern. For the IAT, a greater D-score indicates participants were faster to respond to Vegetable + Positive and Meat + Negative trials than on the Vegetable + Negative and Meat + Positive trials.

Figure 1.3 (left panel) shows the results from the IRAP. A positive D-IRAP shows a pro-vegetable bias and a negative D-IRAP score shows a pro-meat bias. A pro-vegetable bias indicates that participants were quicker to press “True” when presented “Pleasant-Vegetable” or “Unpleasant-Meat” and “False” when presented “Pleasant-Meat” or “Unpleasant-Vegetable” pattern. Figure 1.3 (right panel) shows the results from the IAT, the greater the D-score, the more pro-vegetable the participant is. A pro-vegetable bias means participants were quicker to respond to “Vegetable + Positive” and “Meat + Negative” trials than the “Vegetable + Negative” and “Meat + Positive” trials. The results from the IRAP and IAT both showed that it both groups have a preference for vegetables over meat (D. Barnes-Holmes, Murtagh, et al., 2010). The information from the IAT only tells us there is a

pro-vegetable bias in both vegetarians and meat-eaters (lower bias in meat-eaters). The IRAP however provides more detail, we can see that meat-eaters are pro-vegetable as well as pro-meat. Information from the IRAP provides more detail as it can show a pro-vegetable and a pro-meat bias in one group whereas the IAT only shows the pro-vegetable bias. This difference in information highlights the advantage of using the IRAP over the IAT.

Another example of the distinction between IRAP and IAT can be observed in the study by Barnes-Holmes, Waldron, Barnes-Holmes and Stewart (2009), who tried to predict if participants were city or rural dwellers by measuring their attitudes towards city and country life. The results of the IAT and IRAP could show that there was a 'pro-country' bias, but the IAT could not discriminate between the city and rural groups. The IRAP however, showed that rural-dwellers have a much stronger preference towards the country life than city-dwellers and therefore could discriminate between rural or city dwellers.

To summarize, while both the IAT and the IRAP require the participants to respond quickly and accurately, the IAT has a few issues, which is that the IAT is focussed on associations rather than the relations between the stimuli or events, therefore the IAT only provides an indirect measure of beliefs (D. Barnes-Holmes et al., 2006). Also, the IAT only provides a relative measure of a person's attitude (Hughes & Barnes-Holmes, 2013). In other words, the IAT is not able to assess the relations towards an object which means it is difficult to predict behaviour based on the results of IAT alone. The analysis of IRAP trial types provides more detail over the IAT. There is evidence to show that the IRAP is as good as, if not better, than other implicit and explicit measures when it comes to predicting behaviour in the real world (Nicholson & Barnes-Holmes, 2012).

Materialism

There are plenty of definitions for the word ‘materialism’ and research regarding materialism can be very broad, ranging from different definitions of materialism or what constitutes materialism, but the earliest attempt to measure materialism was by Belk (1985) who suggested that materialism is a trait composed of three facets: envy, non-generosity, and possessiveness. Since then, there have been more empirical methods for measuring materialism developed by Richins and Dawson (1992) and Kasser and Ryan (1993, 1996) who measured materialism as a goal or value that reflects an individual’s beliefs. Currently, the most widely used method to assess materialism is the Materials Values Scale (MVS; Richins & Dawson 1992), or the revised and shortened scale by Richins (2004). The MVS was developed with three components in mind – acquisition centrality (e.g., “I like a lot of luxury in my life”), acquisition as the pursuit of happiness (e.g., “I’d be happier if I could afford to buy more things”), and possession-defined success (e.g., “The things I own say a lot about how well I’m doing in life”). Other researchers have adapted the MVS for different populations such as the MVS-c for children (Oprea, Buijzen, van Reijmersdal, & Valkenburg, 2011). Over the years, materialism has been studied through explicit measures, and my research is the first to measure the implicit attitudes of materialism.

Materialism has been associated with treating others in a more selfish way (Kasser, 2016), for example, those with a higher materialism score tend to score lower in empathy (Sheldon & Kasser, 1995) and higher in narcissism (Kasser & Ryan, 1996), have more antisocial behaviours (Kasser & Ryan, 1993; McHoskey, 1999), engage in fewer prosocial behaviours (Briggs, Landry, & Wood, 2007; Goldberg & Gorn, 1978; Sheldon & Kasser, 1995), and are predicted to be more competitive in the Prisoner’s Dilemma Game (Sheldon, Sheldon, & Osbaldiston,

2000). Overall, people who score higher on the materialistic scale tend to be more self-centred, not team-players, and generally exhibit more anti-social behaviours.

People are consistently being exposed to advertising in different mediums such as advertising on websites, bus stops, YouTube videos, newspapers, television, etc. Constant exposure to materialistic messages causes people to be more materialistic (Shrum et al., 2014). On top of that, advertising exposure has subtle and long-term effect on materialism (Harmon, 2001), which means that repetitive exposure to advertising might make people more materialistic (Oprea, Buijzen, van Reijmersdal, & Valkenburg, 2013). These exposures to materialistic messages probably created relational networks that lead people to achieve the relation “being materialistic leads to success” or “acquiring material possessions makes me happier”. With research showing that materialistic people tend to be less pro-social, it would be in society’s interest to decrease materialistic attitudes. There are three strategies outlined by Kasser (2016) to decrease materialistic values which are supported by empirical and theoretical work. The first strategy is to encourage values that are opposite to materialistic values. For example, Kasser suggests interventions and policies that encourage intrinsic values that support attitudes and behaviours that are more beneficial. For example, helping out more with charity work or volunteering in the community. The second strategy is to reduce the extent of materialistic values people are exposed to; and the final strategy is to help people feel more positive about themselves in terms of physical and psychological needs. Research has shown that people who are more materialistic tend to be less satisfied with life and have a lower quality of life than less materialistic people (Goldberg & Gorn, 1978; Kashdan & Breen, 2007; Kasser & Ryan, 1993; Oprea, Buijzen, & Valkenburg, 2012; Sirgy et al., 1998), have lower self esteem (Chaplin & John, 2007), and the drive to obtain material wealth is a mediator between life satisfaction

and emotional well-being (Chen, Yao, & Yan, 2014; Kashdan & Breen, 2007; Kasser et al., 2014).

So far, I have discussed the behavioural view of implicit attitudes, that is the BIRRs and EERRs and how the REC model offers an understanding of the implicit attitudes. I have also given a brief overview of how the IAT and IRAP works and a comparison of the two in which I argue why the IRAP has an advantage over the IAT. Lastly, I discussed how materialism has only been measured explicitly, and I will look into participant's relational network towards materialism and anti-materialism.

Experiment 1

Advertising appears to reinforce materialistic BIRRs (e.g., new car makes you happy, new iPhone = feeling powerful, feeling rich), and society then reinforces the EERRs of being materialistic (e.g., acquire wealth, boast about wealth). At the same time, there is the possibility of society reinforcing anti-materialistic EERRs. This could be from mingling with friends and family that are not so materialistic, and that verbal community might be reinforcing anti-materialistic EERR networks such as ‘You don’t need that new iPhone’, or ‘That car still works fine’. Overall, materialistic attitudes are related to anti-social behaviours that are self-serving which is detrimental to society. The strategies to counter materialistic attitudes as suggested by Kasser (2016) are to reduce exposure to materialistic values, increase pro-social behaviour, and make people feel more positive about themselves. In behavioural terms, these strategies involve reinforcing pro-social behaviours and BIRRs that are not materialistic (e.g., money is not everything, helping others is better than acquiring wealth). RFT defines relational responses that are established through previous history of reinforcement as an operant class and these responses have been reinforced across exemplars (Y. Barnes-Holmes, Barnes-Holmes, Bryan, & Smeets, 2001). One of the possible ways to train BIRRs is to consistently reinforce relational responses through multiple exemplars, such as telling somebody that success is not measured by total wealth alone, but through other aspects such as relationships with family or friends, or the gaining of experience which money cannot buy, backpacking across the globe, volunteering every weekend. Those are a few examples where the relation of “success” and “happiness” is not linked to “money” or “wealth”. These relations could also be taught through a computer program, where a person is just reinforced for giving the correct answer that “happy” is “less stuff” or “budget brands”. Through consistently reinforcing the

behaviour of pairing “happy” with non-materialistic stimuli, materialistic BIRRs should decrease.

My research goals were to use the IRAP to: (1) determine whether it is possible to train participants to override previous exposure to materialistic messages by training new BIRR links between material wealth and unhappiness, (2) investigate the cumulative effects of the materialistic training prior to the experiment, which comes from exposure to advertising and other possible materialistic messages in society and how training the new materialistic and anti-materialistic BIRR links affect those materialistic attitudes, and (3) to see if an IRAP effect could be obtained from the set of stimuli used in the experiment.

Participants were recruited and placed into one of three groups; Materialistic, Anti-Materialistic, or Control group. Training was done through a process called Multiple Exemplar Training (MET), which is simply reinforcement of bidirectional responding across multiple exemplars (Hayes et al., 2001). In the Materialistic and Anti-Materialistic group, the participants were given MET training for 10 min to train them in their respective BIRRs; Materialistic group for messages that materialism is good/anti-materialism is bad, and the Anti-Materialistic group for messages that materialism is bad/anti-materialism is good before taking the IRAP (see Table 1 in Methods). Participants in the control group received 10 min of playing the computerised card game, Solitaire, so that the participants were not trained or exposed to any materialistic or anti-materialistic BIRRs, but worked on a computer screen for the same length of time as the participants in the other two groups before taking the IRAP. After the IRAP, participants answered the MVS questionnaire as a measure of how materialistic they were: The higher the score on the MVS, the more materialistic they were deemed to be.

The six materialistic stimuli to be used in the IRAP and the MET training were derived from the MVS scale. Six anti-materialistic stimuli were the close-approximate opposite of the six materialistic stimuli in terms of meaning. This method of using words that relate to the construct being measured, materialism, is based on the methodology of Hussey and Barnes-Holmes (2012), who derived the stimuli for measuring depressive emotional reactions by mapping the content of the depression scale from the Depression Anxiety and Stress Scale (DASS) onto the IRAP.

Method

Participants

I recruited 84 participants through the University of Waikato's research participant database, word-of-mouth and recruitment posters put up throughout the Faculty of Arts and Social Sciences. Participants were offered the choice of either course credit (1%) towards their chosen undergraduate psychology course, or to enter a draw to win a department store gift voucher valued at 20 NZD. All the participants were students at the University of Waikato. No other demographic details were gathered.

Apparatus

I administered the IRAP on a Dell OptiPlex 9010 (Intel i5-3570 3.2Ghz processor, 4GB RAM) running a 32-bit Windows 7 Enterprise Operating System (OS). A Dell P2210 22" LCD monitor positioned at eye level was used to present the stimuli. I used the 2012 IRAP Update II, written by Dr. Dermot Barnes-Holmes. Participants used a standard US keyboard to respond to the IRAP trials. Sessions were run in a small, quiet, lit, temperature-controlled room at the University of Waikato, with only myself and the participant present. I sat next to the participant during the training phase. During the testing phase, I sat behind and to the left of the participant. Table 1.1 shows the stimuli that were used for this IRAP.

Table 1.1

IRAP Stimuli

Sample 1: Happy Response option 1: True	Sample 2: Sad Response option 2: False
Target words consistent with Sample 1:	Target words consistent with Sample 2:
More things	Fewer things
Luxury	Basic
Expensive things	Cheap things
Wealth	Plain and simple
Top brands	Budget brands
Trendy	Second hand

Rob Bakker, a technician at the University of Waikato, wrote the program in Java code for the Multiple Exemplar Training (MET) trials. The program was a recreation of the consistent and inconsistent trials of the IRAP with some slight differences. The training trials are meant to train the participants in the materialistic group to be pro-materialism and the anti-materialistic group to be anti-materialistic in 10 min; therefore, feedback is provided at the end of each block (24 trials) so that participants are made aware of their responding and improve on it – to be faster and more accurate. The difference in the MET trials was that when the participant answered correctly, a green tick appeared with the words “Correct!” in the middle of the screen. If the participant answered incorrectly, a red cross with the words “Wrong! Try again” appeared in the middle of the screen.

Solitaire (Cherry, 2009), a computerised version of the single-player card game, was used for participants in the Control group. Solitaire is available by default in Windows (*Windows 7 Enterprise*, 2009).

I printed the Materials Value Scale (MVS) questionnaire on A4-sized paper to be administered to participants. The MVS questionnaire used in this experiment is the shortened 15-question version (Richins, 2004).

Design

Participants in the Materialistic group were given 10 min of consistent-block training and participants in the Non-Materialistic group were given 10 min of inconsistent-block training (discussed below). Participants in the Control group were given 10 min to play Solitaire. Participants were assigned in a quasi-random manner. As participants signed up, they were assigned to either a Materialistic, Anti-Materialistic or Control group in a rotation.

Procedure

I welcomed participants into the room, assigned them a participant number to preserve confidentiality and asked them to sit down in front of the computer. I then asked the participants to read through the Information Sheet (Appendix A). The information sheet explained briefly the reasoning behind the research project, the choice of course credit or entering a draw for store voucher, the experimental procedure and how participant data would be handled. I then answered any questions, and once participants were satisfied, I gave them a consent form (Appendix B) and a course credit form if that option was chosen.

I instructed participants in the Materialistic and Anti-Materialistic group that they were to be given 10 min of MET training and participants in the Control group were to be given 10 min to play Solitaire. I then told the participants that they would be given an IRAP after 10 min of training or Solitaire.

I instructed participants in the MET training group to “respond as if you are materialistic” or “respond as if you are not materialistic” for Materialistic and Anti-Materialistic groups respectively. I explained to the participants that the task was to pair two words and respond to ‘True’ or ‘False’ based on their given MET rule and gave an example of words they would see before beginning the MET program. Each block was 24 trials and at the end of each block was a feedback screen. Participants were told to try and achieve above 80% correct and to do as many blocks as they can in 10 min. I asked participants in the Control group if they knew how to play Solitaire. Participants who knew the rules were told to just play for the next 10 min, while participants who did not know or unsure of the rules of Solitaire were given a quick explanation of the rules and guided to play Solitaire for remainder of the 10 min.

There is a standard Version 1.4 IRAP Generic Experimenter's Script that comes with the 2012 IRAP program. I modified the Version 1.4 IRAP experimenter's script to fit in the new stimuli, and serve as a guide when instructing participants (Appendix C). I pointed out to the participants to read the rule at the beginning of each block, by restating the rule. For example, in the consistent block, the participants saw the words "Please answer AS IF consistent with materialism"; I told the participant if they saw that rule, "Please respond AS IF you are materialistic." Participants were matched with their respective blocks (Materialistic and Control group did consistent blocks first, and the Anti-Materialistic group did inconsistent blocks first). This was to ensure that participants in the Materialistic and Control group were exposed to consistent blocks (be materialistic) first, and participants in the Anti-Materialistic group would be exposed to inconsistent block (be NOT materialistic) first, as to remove order effects, should there be any. Those from the MET training were told to respond as they were for the previous 10 min. Participants from the Control group were told to read the rule at the beginning of each block, "respond as if you are materialistic", and then to answer 'True' or 'False' to the word pair that appears later, based on the rule, along with an example of words they might see. Upon completion of the first two blocks (making 1 block-pair), the IRAP presented a feedback screen that showed the accuracy and median response latencies for the two blocks.

I then explained to the participants the required criteria of responding above 80% correct and to respond faster than 2000ms in subsequent blocks. I mentioned that, should the participant respond slower than 2000ms in future blocks, a red exclamation mark would appear on screen but to not panic and instead focus on keeping the accuracy above 80% and to respond slightly faster than they currently were. Participants in the Materialistic and Control group were then shown that the

rule in the inconsistent block had changed and that they were to “respond as if you are not materialistic” and those from the Anti-Materialistic group were told to “respond as if you are materialistic”. I told the participants that they were tasked to try to achieve the practice criteria over 3 practice block pairs. If participants responded incorrectly over 3 consecutive trials or failed to achieve an accuracy of 80% at the end of the block, I reminded them to slow down and focus on being accurate. If they did not achieve the criteria, I restarted the IRAP program and asked the participant to complete 6 testing blocks and to strive to achieve the set criteria.

Once the IRAP was completed, the participant was given an MVS questionnaire (Appendix D) and a black pen to fill it out. Upon completion of the MVS, I debriefed the participant and the experimental session ended. Each session lasted between 20-40 min. Figure 1.4 shows a schematic diagram of the experimental process.

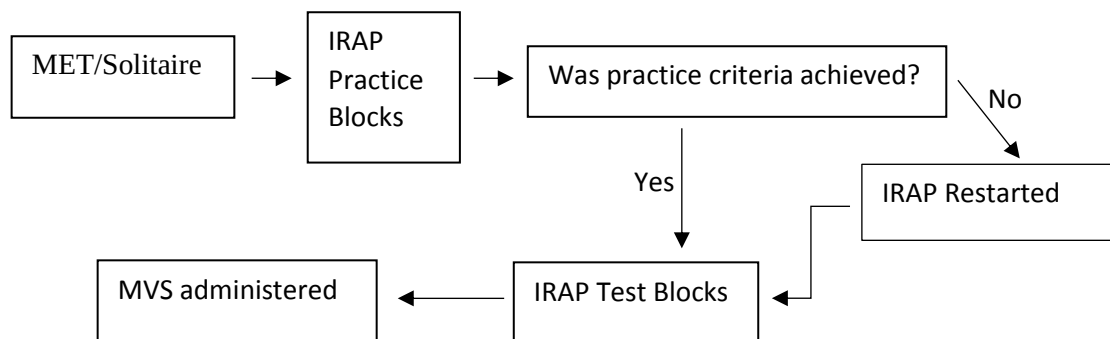


Figure 1.4. A schematic diagram of the experimental progress.

Results

Data Processing

The raw data from the Excel® files produced by the IRAP 2012 were time from the appearance of stimuli to first correct response (response latency) and whether the first response was correct or not (accuracy). I transformed the raw scores into D-IRAP scores in order to minimize impact from individual differences in motor skills and cognitive ability upon the latency data (Bast & Barnes-Holmes, 2014; Greenwald et al., 2003). Table 1.2 shows the steps used to transform raw data into D-IRAP scores. The D-IRAP score is the difference of the response latencies between the consistent trial blocks and inconsistent trial blocks.

Table 1.2

D-IRAP Score Calculation Commonly Used In Recent IRAP Research

Step	Description
1	Only data from the test block are used.
2	Latencies over 10,000 ms are removed from the dataset.
3	Participant's data are removed if more than 10% of the latencies are less than 300 ms.
4	12 standard deviations are calculated. One from each of the four trial types; repeated across three test block-pairs.
5	24 mean latencies are calculated. One from each trial type (4 trials x 6 blocks).
6	12 mean differences are calculated. The mean latency of the consistent test block is subtracted from the mean latency of the inconsistent test block.
7	12 D-IRAP scores are calculated. The 12 mean differences from Step 6 are divided by the corresponding standard deviation from Step 4 which results in one D-IRAP score for each of the four trial types for each test block. The end result is three D-IRAP scores per trial type. Shown mathematically, $D = \frac{Minconsistent - Mconsistent}{SDinconsistent + consistent} .^1$
8	Remove selected data from participants who failed to maintain the accuracy and latency criteria. Median latency and overall accuracy were calculated for each test block. If the median latency exceeded 2300 ms or accuracy was under 75% for either block in a block-pair, then that block-pair is removed. If more than one block-pair was removed, the participant's dataset was excluded. ¹
9	The D-IRAP score is calculated for each trial type, using the three D-IRAP scores for each trial type from Step 7 and dividing them by three. Mathematically, $D_{Final} = \frac{Dpair1 + Dpair2 + Dpair3}{3} .^*$

Notes. ¹ Exclusion criteria were chosen to reduce participant attrition rates as suggested in Hussey, Thompson, McEnteggart, Barnes-Holmes, & Barnes-Holmes, (2015).
* If test block-pair data were excluded in Step 8, the calculation would sum the D-IRAP scores and divide by two.

For the purpose of statistical analysis, I removed data where participants failed to maintain the criteria of $\geq 75\%$ accuracy and a median response time of $\leq 2,300\text{ms}$ on at least two of the three test blocks-pairs as stated in Step 8 of Table 1.2

Pass Rates

From the 84 total participants, 27 participants were assigned to the Materialistic group, 30 participants were assigned to the Anti-Materialistic group and 27 participants were assigned to the Control group. Three more participants were recruited into the Anti-Materialistic group to decrease the attrition rate. Eighteen participants failed to achieve the criteria and one participant was asked to leave the session due to health reasons. The data from a total of 65 (77.4%) participants were used for data analysis: 23 (85.2%) participants from the Materialistic group, 22 (73.3%) from the Anti-Materialistic, and 20 (74.1%) participants from the Control group.

Split Half Reliability

To assess the internal consistency of the IRAP, I totalled the four odd- and even- numbered trials and ran Pearson correlations which were corrected by using the Spearman-Brown formula. Internal consistency was low and nonsignificant, $r = -.02$, $n = 65$, $p = .89$. This means that the IRAP was not measuring ‘materialism’ and was probably measuring some other construct.

Trial type analysis

One-sample t tests were calculated for overall mean D-IRAP score, which is the sum of each trial type across all three groups, the mean D-IRAP scores for the four trial types for each group, and the Total Score, which is the sum of the four trial types, to determine whether they were significantly different from zero. Cohen’s d effect sizes were calculated as well. Table 1.3 shows the mean D-IRAP scores, SEM , N , t , p and Cohen’s d values for the total and three groups. In the total calculation,

the mean D-IRAP scores for Trials 1 ($M = 0.41$, 95% CI = [.32, .50], $t(64) = 9.11$, $p < .001$) and Trial 2 ($M = -.012$, 95% CI = [-.02, -.22], $t(64) = -2.48$, $p = .02$) were significantly different from zero showing that participants were quicker to respond in the consistent blocks. The effect size for Trials 1 ($d = 2.29$) and 2 ($d = 0.62$) were both large.

Table 1.3

Mean D-IRAP score, SEM, df, t, p, and Cohen's d Scores for all Trial Types and Overall Mean across Three Different Groups.

Group type	Mean D-IRAP	SEM	df	t	p	Cohen's d
<u>Overall</u>						
Trial 1: Happy – Materialistic	.41	.05	64	9.11	.00	2.29
Trial 2: Sad – Materialistic	-.12	.05	64	-2.48	.02	-0.62
Trial 3: Happy – Anti-Materialistic	.04	.05	64	0.78	.44	0.20
Trial 4: Sad – Anti-Materialistic	-.04	.05	64	0.84	.40	0.21
Overall Total	.29	.10	64	2.81	.01	0.70
<u>Materialistic</u>						
Trial 1: Happy – Materialistic	.42	.08	22	5.36	.00	2.29
Trial 2: Sad – Materialistic	-.03	.07	22	-0.49	.63	-0.21
Trial 3: Happy – Anti-Materialistic	-.07	.08	22	-0.89	.38	-0.38
Trial 4: Sad – Anti-Materialistic	.07	.08	22	0.88	.39	0.38
Materialistic Total	.39	.19	22	2.02	.06	0.86
<u>Anti-Materialistic</u>						
Trial 1: Happy – Materialistic	.34	.09	21	3.99	.00	1.74
Trial 2: Sad – Materialistic	-.15	.10	21	-1.55	.14	-0.68
Trial 3: Happy – Anti-Materialistic	.10	.08	21	1.24	.23	0.54
Trial 4: Sad – Anti-Materialistic	-.10	.09	21	-1.10	.29	-0.48
Anti-materialistic Total	.20	.15	21	1.29	.21	0.56
<u>Control</u>						
Trial 1: Happy – Materialistic	.48	.07	19	6.93	.00	3.18
Trial 2: Sad – Materialistic	-.19	.08	19	-2.24	.04	-1.03
Trial 3: Happy – Anti-Materialistic	.10	.11	19	0.92	.37	0.42
Trial 4: Sad – Anti-Materialistic	-.12	.10	19	-1.21	.24	-0.55
Control Total	.27	.19	19	1.42	.17	0.65

However, once I broke it down to the individual groups, only the scores from Trial 1 for each of the all the three groups were significantly different from zero, showing that participants, for Trial 1, were quicker to respond in the consistent blocks than in the inconsistent blocks. For example, when the participants were shown “Happy” and “Luxury” they were quicker to press “True”, as opposed to when they were shown “Sad” and “Budget Brands”, they were slower to press

“False” Only for the control group was the score in Trial 2 significantly different from zero, and is a negative value, which means participants in the control group were faster in responding in the inconsistent blocks than in the consistent blocks.

For the Materialistic group, only the mean D-IRAP score for Trial 1 ($M = 0.42$, 95% CI = [.59, .26], $t(22) = 5.36$, $p < .001$) was significantly different from zero with a large effect size ($d = 2.29$). The mean D-IRAP scores for Trials 2, 3, and 4 were not significantly different from zero ($p > .05$) with a small effect size in Trial 2 ($d = 0.21$) and medium effect sizes for Trials 3 and 4 ($d = 0.38$). The means ranged from -0.12 to 0.41. Overall for the Materialistic group, the effect size was large ($d = 0.86$) while the mean D-IRAP score was not significantly different from zero ($M = 0.39$, 95% CI = [.80, -.01], $t(22) = 2.02$, $p = .06$).

I did not find a similar pattern in the Anti-Materialistic group except for the mean D-IRAP scores for Trial 1 ($M = 0.34$, 95% CI = [.52, .16], $t(21) = 3.99$, $p < .001$) with a large effect size ($d = 1.74$). The mean D-IRAP scores for the other trials were not significantly different from zero ($p > .05$). The means were smaller here, ranging from -0.15 to 0.34. Overall for the Anti-Materialistic group ($M = 0.20$, 95% CI = [.51, -.12], $t(21) = 1.29$, $p = .21$), the results were not statistically significant, and the effect size was medium ($d = 0.56$).

In the Control group, I found that the D-IRAP score means ranged from -0.19 to 0.48 and that only Trial 1 ($M = 0.48$, 95% CI = [.63, .34], $t(19) = 6.93$, $p < .001$) and Trial 2 ($M = -0.19$, 95% CI = [-.01, -.36], $t(19) = -2.24$, $p = .04$) were significantly different from zero. The effect sizes for Trial 1 ($d = 1.74$) and Trial 2 ($d = 1.03$) were large, whereas Trial 3 and 4 had medium effect sizes ($d < 0.5$). Overall, the total mean D-IRAP score for the control group ($M = 0.27$, 95% CI = [.67, -.13], $t(19) = 1.42$, $p = .17$) was not significantly different from zero, but there was a large effect size ($d = 0.65$).

Figure 1.5 shows the mean D-IRAP scores for the four trial types across the three different groups with 95% confidence interval error bars. A positive D-IRAP score represents a “more materialistic” attitude and a negative D-IRAP score represents “less materialistic” attitude. Each bar represents the overall score in each of trials, which is after the mean of the consistent block has been subtracted from the mean of the inconsistent block.

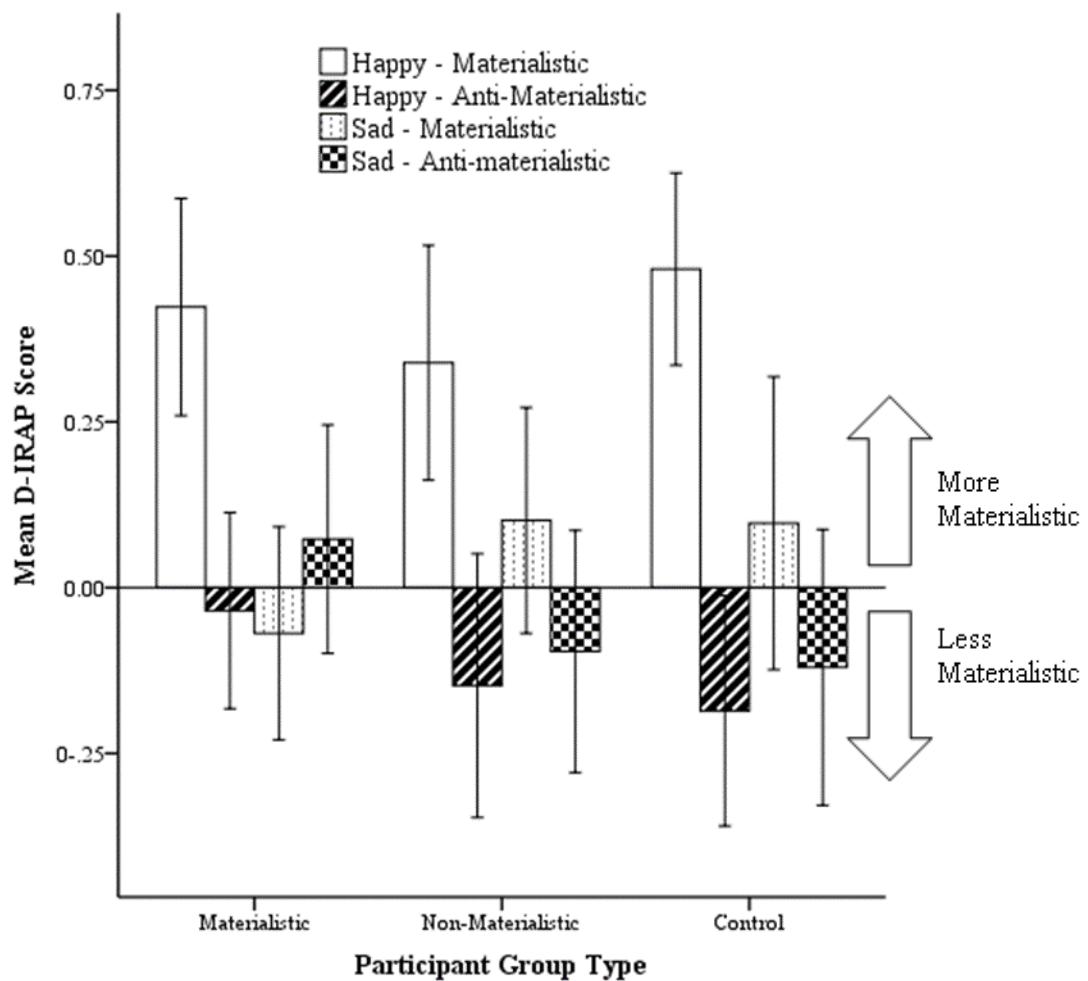


Figure 1.5. Mean D-IRAP trial type scores across three different groups. Error bars show the 95% confidence intervals. Positive scores mean participants responded faster in the consistent blocks and negative scores mean participants responded faster in the inconsistent blocks.

ANOVA

I also performed a three-way-mixed ANOVA, with the independent variables of “Group” as a between-subject variable, “Sample” and “Target” as within-subject

variables, with the D-IRAP score as the dependent. Group here was Materialistic, Anti-Materialistic and Control, Sample was “materialism” and “anti-materialism”, and target as “happy” and “sad”.

The assumptions of equality of covariance matrices were met, Box’s $M = 17.16$, $F(20, 13398) = .78$, $p = .74$. There was no main effect of group, $F(2, 62) = .31$, $p = .73$, $r = .1$. This means that there was no difference in D-IRAP scores for students in the Materialistic, Anti-Materialistic and Control groups.

Table 1.4 shows the scores from the three-way mixed ANOVA for within-subjects.

Table 1.4

Three-Way Mixed Analysis of Variance of Within-Subjects Effects

Type	Type III SS	df	Mean Square	F	p	r
Sample	1.42	1	1.42	9.48	.003	.36
Target	6.39	1	6.39	51.67	.000	.67
Sample * Group	.11	2	.06	.38	.67	.11
Target * Group	.90	2	.45	.03	.03	.32
Sample * Target	3.22	2	3.22	18.14	.00	.48
Sample * Target * Group	.27	2	.14	.76	.47	.15

There was a significant main effect of “sample”, $F(1, 62) = 9.48$, $p = .003$, $r = .36$. Table 1.5 shows the estimated marginal means for sample. The mean D-IRAP score for materialism ($M = .15$, 95% CI[.08, .21]) was significantly higher than for anti-materialism ($M = -.002$, 95% CI[-.08, .07]).

Table 1.5

Estimated Marginal Means Sample

Type	Mean	Standard Error	95% CI	
			Upper	Lower
Materialism	.15	.03	.08	.21
Anti-Materialism	-.002	.04	-.08	.07

There was a significant main effect of “target”, $F(1, 62) = 51.67$, $p < .001$, $r = .67$. Table 1.6 shows the estimated marginal means for target. The mean D-IRAP

score for “happy” ($M = .23$, 95% CI[.16, .29]) was significantly higher than for “sad” ($M = -.09$, 95% CI[-.16, -.02]).

Table 1.6

Estimated Marginal Means Target

Type	Mean	Standard Error	95% CI	
			Upper	Lower
Happy	.23	.03	.16	.29
Sad	-.09	.04	-.16	.02

There were no significant interactions between sample and group or between target and group. However, there was a significant interaction between sample and target, $F(1, 62) = 18.14$, $p < .001$, $r = .48$. Figure 1.6 shows an interaction plot of the mean

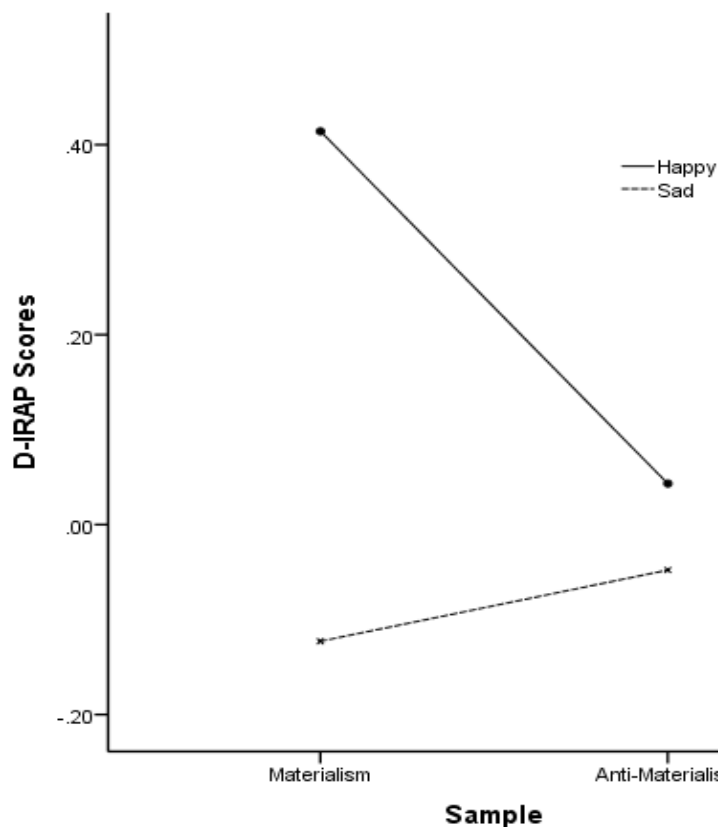


Figure 1.6. Interaction plot of D-IRAP Scores plotted against the Sample – “Materialism” and “Anti-Materialism” for Target - “happy” and “sad”.

Table 1.7 shows descriptive statistics for the Total MVS scores. There was a trend in the mean Total MVS scores, where the Materialistic group produced the highest ($M = 41.1$), the Anti-Materialistic group lower ($M = 39.9$) and the Control group the lowest mean score ($M = 36.8$).

Table 1.7

Mean Total MVS score, N, Standard Deviation, 95% Confidence Intervals for Each Group.

Group type	N	Mean	Sd	95% CI	
				Upper	Lower
Materialistic	23	41.1	7.29	44.28	37.98
Anti-Materialistic	22	39.9	8.06	43.44	36.29
Control	20	36.8	6.83	40.00	33.60

Table 1.8 shows the results of a one-way analysis of variance for the Total MVS score for each group. The results showed that there was no significant difference ($p = .16$) between the three different groups for the Total MVS scores.

Table 1.8

One-Way Analysis of Variance of Total MVS score.

		SS	df	Mean Square	F	p
Total MVS score	Between Groups	208.74	2	104.37	1.89	.16
	Within Groups	3420.40	62	55.17		
	Total	3629.14	64			

Regression

I performed two regression analyses to predict how the number of blocks completed in the Multiple Exemplar Training (MET) or accuracy in the MET would affect the total score in the Materials Value Scale (MVS) for the Materialistic and the Anti-Materialistic group as shown in Table 1.9. The factors used in the regression analysis were the number of MET blocks done and the overall MET mean percentage (total accuracy) against the total MVS score. The regression model for the Anti-Materialistic group was significant, $F(2,19) = 3.833$, $p = .04$, but the model for the Materialistic group was not significant, $F(2,20) = .570$, $p = .58$.

For the Anti-Materialistic group, that the total number of MET blocks completed predicted the total MVS score, $\beta = .56$, $t = 2.52$, $p = .02$, in that the more trials completed, the higher the total MVS score predicted. On the other hand, the

total number of MET blocks completed in the Materialistic group, was not a significant predictor of the total MVS score, $\beta = -.05$, $t = -.21$, $p = .31$.

Table 1.9

Regression of Total Number of MET Blocks Done and MET Mean Percentage Correct against Total Materials Value Scale Score.

MVS scale	Group		<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Total MVS	Materialistic	Constant	41.47	27.08		1.53	.14
		MET Blocks Done	-1.61	1.54	-.26	-1.05	.31
		MET Mean % Correct	.11	.33	.08	.322	.75
Total MVS	Anti- Materialistic	Constant	24.08	20.17		1.20	.25
		MET Blocks Done	4.05	1.60	.56	2.52	.02
		MET Mean % Correct	-.05	.25	-.05	-.21	.83

In summary, only in Trial 1, Happy – Materialistic, were participants significantly faster to respond in the consistent block than in the inconsistent block. This means that the participants in all the groups were consistently materialistic and that the training had no effect. Results were mixed for the other trial types between groups. Finally, the regression analysis shows that the completion of more Anti-Materialistic blocks is predictive of higher MVS scores.

Discussion

During my study, I examined: (1) whether it is possible to train participants to override previous exposure to materialistic messages by training new BIRR links between material wealth and unhappiness, (2) the cumulative effects of the materialistic training over time and how training new BIRR links affect them, and (3) if an IRAP effect could be obtained from the set of stimuli used in the experiment. The results showed that I was unable to train participants to override previous exposure to materialistic messages by training new BIRR links between material wealth and unhappiness in 10 min. In addition to that, from the regression analysis, it appears that the participants who did more Anti-Materialistic training blocks tended to have a higher total MVS score. There was no statistically significant result from decreasing Materialistic BIRR (Trial Type 1) across all groups, suggesting that there was no effect of decreasing Materialistic BIRR in the participants. I hypothesize that there was no effect due to the MET training being too short - 10 min was not sufficient to change Materialistic BIRRs that have been reinforced for extended periods. There is another possibility that the stimuli used in MET and IRAP did not reflect anti-materialism, which could explain the low split-half reliability scores, as the IRAP was shown not to be measuring a single construct. Finally, I did find an IRAP effect from the set of stimuli used in the experiment, but only for Trial Type 1 (Happy-Materialistic) across all groups. Only in the Control group did I find an IRAP effect in Trial Type 2 (Sad-Materialistic).

Before beginning to discuss what the data mean, I will first explain what each trial type means. To make it easier to understand, I shall discuss the trial types as if they were a positive value (more materialistic). First, a recap in the rules given to the participants before beginning the IRAP, in the consistent block, participants were told “Respond AS IF you are materialistic.” In the inconsistent block,

participants were told “Respond AS IF you are not materialistic.” In the first trial type, Happy-Materialistic, when presented with ‘Happy’ and words like ‘Luxury’, participants were quicker to respond when instructed to press ‘True’ than when instructed to press ‘False’. In the second trial type, Happy-Anti-Materialistic, when presented with ‘Happy’ and words like ‘Basic’, participants were quicker to respond when instructed to press ‘False’ than when instructed to press ‘True’. The third trial type, Sad-Materialistic, when presented with ‘Sad’ and words like ‘Luxury’, participants were quicker to respond when instructed to press ‘False’ than when instructed to press ‘True’. Lastly, the fourth trial, Sad-Anti-Materialistic, when presented with ‘Sad’ with words like ‘Cheap Things’, participants were quicker to respond when instructed to press ‘True’ than when instructed to press ‘False’.

Materialistic Group

The IRAP results from the Materialistic group showed that participants were significantly faster to respond in the consistent blocks than to respond on the inconsistent block for Happy-Materialistic trial. This is also true for the Sad-Anti-Materialistic trial type, where participants were faster on the consistent blocks than the inconsistent blocks. Participants were faster to respond on the inconsistent blocks than on the consistent blocks for Happy-Anti-Materialistic, and Sad-Materialistic trials. In summary, the D-IRAP scores show that participants’ BIRR tend to be materialistic, which means that they are quicker to answer ‘True’ when in the Happy-Materialistic, and Sad-Anti-Materialistic trials. In a broader aspect, this probably reflects the materialistic messages that have been reinforced by media and advertising over time; to be happy with materialistic values and sad with anti-materialistic values.

Anti-Materialistic Group

The results from the Anti-Materialistic group shows that participants were also faster to respond in the consistent blocks than to respond on the inconsistent block for the Happy-Materialistic trial as well. Participants in this group were quicker, but not significantly quicker, than the participants from the Materialistic group when instructed to press 'True' in the Happy-Anti-Materialistic trial. On the Sad-Materialistic trial, participants in this group were quicker on the consistent blocks. Lastly, on the Sad-Anti-Materialistic trials, participants were quicker to respond on the inconsistent blocks. There was no effect on decreasing the materialistic BIRRs (Trial Type 1), therefore reflecting that the participants' materialistic BIRRs were not affected enough for a change nor were the anti-materialistic BIRRs strengthened enough by the MET training.

Control Group

The results from the Control group shows that participants were the fastest to respond in the consistent block for the Happy-Materialistic trial. Participants here were also the fastest to respond in the inconsistent blocks for Happy-Anti-Materialistic, and Sad-Anti-Materialistic trials. Just like the Anti-Materialistic group, participants here were significantly quicker in the consistent block for the Sad-Materialistic trials.

To put it simply, the results showed that in all the groups, the Happy-Materialistic (Trial Type 1) trial was statistically significant from zero, showing an IRAP effect, but 10-min MET trials did not manage to change the BIRRs. These findings show that participants are still materialistic, which could translate to materialistic behaviours, such as higher compulsive purchasing behaviour (Dittmar, Bond, Hurst, & Kasser, 2014), increased shopping behaviours (Segev, Shoham, & Gavish, 2015), unlikeliness to volunteer (Briggs et al., 2007), and other anti-social

behaviours. On the other hand, in the Control group, the IRAP effect is also present in the Happy-Anti-Materialistic trials. What this means is that the participants are also quick to say ‘True’ when presented with ‘Happy’ when paired with words such as ‘Budget Brands’. To summarize, this means that the Control group participants are materialistic, but at the same time, they are also anti-materialistic. It would be a big leap to conclude that participants in the Control group can be predicted to engage in materialistic behaviours (i.e. anti-social behaviours) as well as opposites of anti-materialistic behaviours (i.e. pro-social behaviours). Instead, to look into the difference in scores as to why participants in the Control group can be pro-materialistic as well as pro-anti-materialistic, a deeper analysis is required to find out what the participants think of the stimuli used in the experiment. This compatibility of stimuli was explored in Experiment 2.

From a behavioural perspective, behaviour is related to the context, therefore what is seen as anti-social behaviour (i.e. not volunteering) would probably present itself when participants are asked if they would rather volunteer or go shopping on the weekend. In other words, participants cannot be generalized as anti-social individuals just because they have a high MVS score. During the IRAP’s inconsistent block, participants were given the rule to “respond AS IF you are not materialistic”, without any other following context. Each participant could have a different interpretation of “anti-materialistic” and therefore were not able to relate to the stimuli used in this experiment as per what I had in mind. This lack of context could lead to different interpretations of the materialistic and anti-materialistic stimuli which was explored in Experiment 2. In addition to that, there was an observable, but not statistically significant decrease in D-IRAP scores in the Happy-Materialistic trials (Trial Type 1) in the Anti-Materialistic group. So perhaps the MET trials did affect the materialistic BIRR networks slightly.

ANOVA

In the three-way ANOVA, there was no main effect of group, therefore, there was no difference between D-IRAP scores across groups. The significant results are the main effect of “sample” – materialism vs anti-materialism, “target” – Happy vs Sad, and the interaction between sample and target. The interaction plot shows a large discrepancy between materialistic and anti-materialistic D-IRAP scores for “Happy” but not for “Sad”. This could mean that participants’ BIRRs are quicker to react when shown the stimuli “Happy” with either Materialistic or Anti-Materialistic stimuli, but not so when shown with the stimuli “Sad”. In other words, participants find it easier to contact materialistic or anti-materialistic BIRRs when paired with the word “Happy” as opposed to “Sad”. The word “Sad” might not even have a strong enough relational network to elicit a response when paired with materialistic or anti-materialistic stimuli. This effect will be explored in Experiment 2.

Attrition Rate

The attrition rate in the Anti-Materialistic groups was the highest (26.7%), the Control group was the second highest (25.9%), and the Materialistic group was the lowest (14.8%). Participants from the Materialistic and the Anti-Materialistic groups had 10 min of exposure to IRAP trials, since the MET trials are just repetition of some IRAP trials. This pattern in attrition rate might be reflective of the stimuli used in the experiment. For instance, the Anti-Materialistic group had the highest attrition rate which is probably because the participants have not been trained to relate to the stimuli as “anti-materialistic”, there was no context given to the participants to frame those stimuli as “anti-materialistic”, and because the stimuli used is probably not reflective of anti-materialism. The Control group was the second highest attrition rate because they did not have prior exposure to IRAP trials

and therefore did not have more practice to achieve the responding criteria of 80% accuracy and 2000ms response speed on this difficult IRAP trial. The Materialistic group had the lowest attrition rate because participants can relate to the stimuli in a materialistic way, which would have been trained by advertising and society over time. One way to reduce attrition in IRAP studies is to use a ‘priming’ IRAP before taking another IRAP (Kishita, Muto, Ohtsuki, & Barnes-Holmes, 2014; Vahey, Boles, & Barnes-Holmes, 2010). To put it loosely, an ‘easy’ IRAP is given as a primer, to get participants familiar with IRAP, in order to decrease the attrition rate when participants are then given the more “difficult” IRAP. This sort of priming is said to increase the familiarity with the task and stimuli so that the participants can answer more difficult IRAPs, as they are quicker in switching between the consistent and inconsistent blocks (Kishita et al., 2014; O’Toole & Barnes-Holmes, 2009; Vahey et al., 2010). This priming using “easy” IRAP before a “difficult” IRAP to lower attrition rate, however, was not fully present in my study as the Anti-Materialistic group should have the primer in the form of 10 min of Anti-Materialistic MET, but instead showed a higher attrition rate than then Control group which had no pre-IRAP training.

Regression

The only significant result from the regression analysis was that participants who did more Anti-Materialistic MET trials were predicted to score higher on the MVS. In other words, the participants were predicted to be more materialistic, the more Anti-Materialistic MET trials they complete. This could probably be explained by the stimuli used in the Anti-Materialistic trials. Words such as “Fewer things”, “Basic”, “Cheap Things”, “Plain and Simple”, “Budget Brands”, “Second Hand”, might not necessarily reflect Anti-Materialistic values. I created the words used in the Anti-Materialistic trials by using words that closely approximated the opposites

of words used in the Materialistic trials, which were derived from the MVS. It could be that words that are opposite in meaning to materialistic words are actually words that still relate to materialistic relational networks. That is, it is possible that the anti-materialistic words did not encapsulate the true meaning of anti-materialism for the participants. Adding to that, the lack of context of what “Respond AS IF you are anti-materialistic” could have led participants to access different anti-materialistic relational networks than those I had wanted them to access.

Limitations, Future Research, and Conclusions

The IRAP effect was observed only for the Happy-Materialistic trial across all three experimental groups, but it cannot be generalized as a predictor of materialistic behaviour as there was no data taken on materialistic behaviour. The results might not generalize to other populations as well because the participants in the experiment were only students. Students would be working part-time jobs at best, or having allowances from student loan or their parents, meaning to say their earning potential is a lot lower compared to working adults. The difference in earning power could account for the different interpretations of some of the anti-materialistic stimuli (i.e. budget brands, cheap things, second hand) and was explored in Experiment 2. For example, for a banker who earns a lot more than a student, buying *budget brand* clothes might make him *sad*, and that could be reflected in the relational networks, a faster response speed when shown those stimuli. For a student who earns a lot less, *budget brand* clothes would not make the student *sad*, and that could have been reflected in the relational networks, with a slower response speed that is above the 2000 ms criteria. Also, because of the method of using close approximates of the opposites of materialism, the stimuli used in Anti-Materialism trials may not be a clear reflection of Anti-Materialism. This interpretation is supported by the high attrition rates of the Anti-Materialistic group

and the regression analysis. To address the question of what words represent “Anti-Materialism”, I ran focus group sessions with some of the participants in Experiment 1 to gather their comments regarding the stimuli used in Experiment 1 and their suggestions for words that better represent “Anti-Materialism” in a student context.

In conclusion, in Experiment 1, I looked into the possibility of significantly decreasing materialistic BIRRs in a short amount of time, which I could not achieve, but a small change was still observed between experimental and control groups. The results also suggest that there is more than just “anti-materialism” that is being measured and that perhaps there is another underlying construct that needs to be teased out.

Experiment 2

The results of Experiment 1 suggested that there might be more to the construct of “Materialism” and “Anti-Materialism” than just the 12 stimuli used, which were “more things, less things”, “luxury, basic”, “expensive things, cheap things”, “wealth, plain & simple”, “top brands, budget brands”, and “trendy, second hand”. The mixed results obtained from Experiment 1 suggested that perhaps the concept of materialism is not as clear-cut as simple words, and that the relational networks that affect the “value” that materialism or anti-materialism has is more complex than originally thought. Previous researchers have pointed out that materialism is a function of an individual’s own values (Kilbourne, Grünhagen, & Foley, 2005). In order to delve deeper into the relations that surround the construct of materialism and anti-materialism, I conducted a focus group to find out what the participants thought about the IRAP experiment and analysed the transcript using thematic analysis. The focus group was to find out what participants thought about Experiment 1 in terms whether or not materialism and anti-materialism was reflected in the stimuli used, and, if not, which words could potentially be reflective of materialism or anti-materialism.

Thematic Analysis

Thematic analysis is a technique used in qualitative research to identify, analyse and report themes within a data set (Braun & Clarke, 2006; Guest, MacQueen, & Namey, 2012; Howitt & Cramer, 2014). There is no clear agreement on how thematic analysis is and how it should be done (Attride-Stirling, 2001); but it can be agreed upon that there are many commonalities across qualitative analytic methods, such as finding patterns, creating categories, data intimacy and the coding process (Saldaña, 2011). It should also be noted however that proper and systematic guidelines for conducting thematic analysis are not well-established and is an area

that requires development (Boyatzis, 1998; Braun & Clarke, 2006; Guest et al., 2012). Despite that, thematic analysis is widely used because it is regarded as the most useful, and easiest techniques to capture the complexities of meaning contained within textual data (Braun & Clarke, 2006; Guest et al., 2012).

As there are no systematic guidelines for thematic analysis, qualitative psychologists should be clear about the what they are doing and why (Attride-Stirling, 2001). I used the 6-phase guide outlined by Braun and Clarke (2006), which is summarized in Table 2.1.

Table 2.1

Phases of Thematic Analysis, from Braun and Clarke (2006)

Phase	Description
1. Familiarizing yourself with the data	Transcribing data, reading and re-reading the data, noting down initial ideas.
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic map of the analysis.
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definition and names of each theme.
6. Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Patterns in thematic analysis are classified and coded in two ways: first, an inductive coding approach where the collected data are not made to fit into existing coding framework and not directed towards the researcher's theoretical framework, but instead the themes arise from the data by themselves (Braun & Clarke, 2006). The second approach, theoretical or deductive analysis, is driven by the researcher's theoretical framework and research question (Braun & Clarke, 2006). When conducting thematic analysis, if themes emerge from anywhere, they emerge from

the interchange between the researcher and the data (Willig, 2001). For my research, I conducted the thematic analysis using the second method, theoretical, as I bring to the research a theoretical or analytic interest. This form of thematic analysis tends to provide less detailed analysis of the data (Braun & Clarke, 2006)

What is a Theme?

“A theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set” (Braun & Clarke, 2006, p. 82). There is also no hard-and-fast method to decide what constitutes as a theme, therefore it is up to the researcher’s judgement to determine what constitutes as a *theme* (Braun & Clarke, 2006). The results from Experiment 1 showed that participants in the Control group were both materialistic and anti-materialistic in terms of their BIRRs. This was perhaps due to the stimuli used in Experiment 1 not being compatible, or reflective of the anti-materialistic concept that I had in mind. The themes that may be generated from focus group discussion in Experiment 2 may shed some light on whether the stimuli used in Experiment 1 were reflective of *materialism* or *anti-materialism*, what replacement words could constitute as *anti-materialism*, and the thought process of the participants when they are asked to be materialistic or anti-materialistic.

Method

Participants

I sent an email invitation to 63 participants who provided an email address in the Consent Form (Appendix B) from Experiment 1 because they wished to receive a copy of the findings of the experiment. Of the 63, eight of those email addresses failed to deliver. Twelve participants responded to the invitation, agreeing to meet for a focus-group discussion. Participants were offered 1% course credit which they could apply to one of several psychology courses to improve their final mark for their participation.

Ethical consideration

My focus group research was approved by the School of Psychology Ethics Committee at the University of Waikato (#16:01).

Procedure

Two focus group sessions were held. Session 1 with 10 participants and Session 2 with two participants. I had given participants a choice of two time slots, 1-2pm or 2-3pm due to room booking availability at the University of Waikato, and 10 out of the 12 participants signed up for the 1-2pm time slot. With the remaining two participants, I had planned to cancel the 2-3pm session, but as the participants were very enthusiastic and eager, I ran Session 2 anyway. Participants responded by email to an agreed time, date and place for the focus group. At the scheduled times, the participants were invited to sit in a circle in one of the rooms, with a window, located at the University of Waikato, Faculty of Arts and Social Sciences. When all the participants had gathered, I introduced myself and explained the purpose of the focus group and told them that the session will be audio recorded. I provided the participants with copies of the consent forms (Appendix B), course credit forms, and a printout of Table 1.1 showing the stimuli used in Experiment 1.

A list of open-ended interview questions (Appendix E) was prepared as a prompt for the focus group discussion. The main questions asked were focused around what participants thought about the stimuli used in Experiment 1, whether or not they were reflective of materialism or anti-materialism, and what they thought about anti-materialism. Once the participants had filled out the forms, I began audio recording of the session. Each session lasted around 30-40 min. At the end of the session, I thanked the participants for their attendance and willingness to participate in the focus group. The recordings for both sessions were transcribed.

Findings/Discussion

In Session 1, not all the participants were actively participating in the discussion, a majority of the discussion was centred on five of the participants and the rest were quiet. Session 2 was a more active discussion, which could be due to the small number of participants. The written transcripts from Session 1 was 4622 words, and Session 2 was 3713 words. From those two transcripts, I extracted some common themes, grouped them and summarized them into a few themes: (a) *“The stimuli used do reflect Materialism”*, (b) *“The stimuli used do not reflect Anti-Materialism”*, with two sub-themes of *“replacement words that might reflect anti-materialism”*, *“happy words but not sad for the stimuli used”* and (c) *“MET training is too short”* with a sub-theme of *“awareness”*. I will describe these themes in more detail below.

The stimuli used do reflect Materialism

This theme reflects that the participants who actively participated in the discussion agreed that the six stimuli used in Experiment 1 did reflect the values of Materialism. I asked if the six stimuli used in Experiment 1 was reflective of materialism, and while most of the participants agreed that it did, there was one

participant who pointed out that materialism has different values to it than just “obtaining branded stuff”. When asked to elaborate on it, that participant said:

Sometimes I think that materialism is like, just the accumulation of stuff whether it is considered designer stuff or not, do you know what I mean? If I go and buy a whole lot of clothes but from a second hand store, but because I bought a whole lot of clothes I could still see that as being materialistic

So essentially, the participants agreed that the stimuli used were reflective of “materialism”, despite the varying degree of value that they assigned to materialism. The general agreement was that materialism centres on obtaining material things, or more things.

The stimuli used do not reflect Anti-Materialism

This theme is more complicated and was the major part of the focus group’s discussion. So far, previous research has examined how materialistic participants are, but with the basic assumption that people are essentially materialistic to varying degrees. There has been no research that looks into anti-materialism, which is probably the opposite end of the materialistic spectrum – rejecting material products. I asked if the stimuli used in Experiment 1 was reflective of the concept of anti-materialism. As one participant has aptly pointed out:

I feel like these sorts of words are something that somebody who is materialistic would class. Like would class something as being basic or as being budget or plain and simple, but if you think that about something, and isn't that a materialistic mind-set or such?

Which would probably be true, as the first-world populations live in a materialistic world, the method of creating the six anti-materialistic stimuli was merely a

brainstorm session of coming up with words that were approximately the opposite of the six materialistic stimuli. It is perhaps this method of close approximation of opposites that led to six anti-materialistic words that can still pass as materialistic. As previously pointed out by a participant, being able to buy multiple *cheap* clothes is still materialistic, as they are now able to buy *more* clothes than if it was an expensive brand. In this context, therefore, *cheap* and *budget* has a more materialistic connotation than I thought, as two participants did reflect this sentiment

In addition, different participants have different thoughts about what constitutes as anti-materialism. For one of the participants, anti-materialism was about living within your means, the participant said, “Living within your means type of thing, not putting so much emphasis on material things. In this case, living within your means would still reflect materialism as it involves obtaining material wealth, but just enough to be within the participant’s earning power as well as to function well enough in today’s materialistic society. Another participant agreed and built upon that same idea,

like realistically, you only need like one pair of jeans until that pair of jeans have worn out and then you'd need another pair of jeans sort of thing, so...I suppose anti-materialism would be having that one pair of jeans rather than having multiple styles of jeans even if they were multiple budget styles and are cheap, and uh basic, but you still got it.

In the subject of living within one’s means, say you were to really only own one pair of jeans till the end of your life cycle. That could be seen as anti-materialistic, from a functional view, however, it could also be materialistic, as you would be buying that one pair of jeans. Essentially, that would probably be better classified as less materialistic rather than anti-materialistic. Going into finer details, for example, I

asked about the stimuli “budget brands” and how that is reflective of anti-materialism, and most of the participants mentioned that it was not. Participant 1 said “maybe instead of budget brands, you'd have uhm, grows own crops.” Participant 2 chimed in “Yeah, buying. That's one way of looking at it. Whereas uhm, growing your own veggies, that's anti-materialism”, with Participant 3 stating “But it's still stuff, just because something's cheap doesn't mean that you're anti materialistic. Like going to K Mart and buying a whole lot of stuff”.

Overall, this theme builds onto the next theme. As the participants mostly agreed that the stimuli used in the experiment were not reflective of anti-materialism. One of the participants said “I think that these words are...less materialistic, than these ones but not necessarily not the opposite.” Participant 2 mentioned:

Like, there's anti-materialism of that, but then the way I was looking at, I was looking at it of as opposite to materialism, like kind of how you made them opposite, I was just thinking of opposite, not like actual anti-materialism

To which, Participant 2 agreed, “Yeah, that's what I was thinking of too”. Participant 3 chimed in, stating “So, the words are like anti, but it's not really anti-materialism”. Participant 4 said “Because consumerism is everywhere, that it's just ingrained, that it kind of becomes second nature for everybody” and Participant 5 was unsure about how the stimuli were reflective of anti-materialism:

Uhm, I don't know, I feel like, yeah, most of them don't capture uh, but I think it's, I don't know like I was saying before, it comes down to people's definition of it, maybe they're just unsure of what it is.

While the materialism stimuli were effective in contacting the materialistic networks, when it came to anti-materialism, the words, despite being close

approximations of opposite to materialism, were still not reflective of anti-materialism. The following sub-theme will delve deeper into what anti-materialism is and which words could potentially reflect that concept.

Replacement of words that might reflect anti-materialism

I asked participants for suggestions of words that could replace the six stimuli used in Experiment 1, and which might reflect anti-materialism. Participant 1 suggested, “Hand-me-downs. Hand-me-down clothing. It's anti-materialism. That's reusing what is already there, instead of carrying on spending more money.”

Participant 2 agreed with that statement, “Hand-me-downs...sounds more anti. Yeah, true. I love hand-me-downs”.

Essentially, it is the value that participants place on objects which determines whether a word is reflective of materialism or not. Hand-me-downs were cited to reflect anti-materialism as it involved no monetary value, in the receiver of the items did not have to pay or exchange money for the item. Whereas, if it was second hand, as one participant said:

Cause you're still buying second hand, going into the shop and then still placing that materialistic value on the product instead of acquiring it free from an older brother or sister.

So, when money is involved in an exchange that would be reflective of materialism. To truly be anti-materialistic, no money has to be involved in a trade. For example, in the first focus group, the participants suggested words that were more on action, and away from the focus of monetary value; one of the participants said “Maybe like action words, those words are kind of like nouns, but like how we do things, to do some sort of anti-materialistic attitudes. We can describe it using verbs, action words”. Another participant suggested “Could it be volunteer work. We are aiming

at careers as psychologists probably would value like quality strengths more than money, so that's the counted as anti-materialistic.” To which another participant chimed in, “the sense of achievement.” Compiling all those, I asked the participants if “giving it away, and donation, are those words more anti-materialistic?”

Participants agreed, saying “Yeah. It does. Donation. Yeah”, “Yeah, charity work, giving time to charity, that's all anti-materialism.” And I asked if volunteerism could work as anti-materialism as well, which participants agreed that it did.

Apart from action, using verbs, the context at which a situation occurs is relevant to whether the action is classed as materialistic or not. One of the participant suggested that materialism is linked with personal image, and how others perceive your actions:

Yeah. And I think like, anti-materialism is kind of like, not, caring, what people think, sort of thing? Doing your own thing. Materialism is kinda like pleasing people. Like wanting people to think you're cool. That's kinda what's in my head.

Another participant said:

I feel like, uhm, materialism, like, it feels to act materialistic it means you'd be so concerned with, it's like an image. So I reckon sort of, say, you got people like Kanye West and such who wear all those flash clothes and flash and all that. You know, cool stuff. And then you think of that, anti-materialistic kind of like no, you know,

In light of that discussion, I raised the hypothetical question to participants in Session 1, if there was a hermit living in the wild, would that be anti-materialistic. One participant said “No.” Another participant argued “No. I don't think you can be

anti and have the experience of it, you know? You can't be a smoker if cigarettes don't exist in your world." It appears that the concept of materialistic and less materialistic is due to the existence of a consumerist culture. If that were to be absent, perhaps this view of "being materialistic" would not exist as well. The presence of a contrasting and strikingly opposite situation is what gives rise to the "anti-materialistic" mind-set.

With the other focus group in Session 2, the participants were focussing on the functionality of the object in use. The function of the object is what determines if the situation can be classified as materialistic or less. Participant 1 said "Like I've got a bag and a pencil case, but really I only need a bag. I can just put my pens in my bag, rather than put them in a pencil case. Participant 2 gave a different example of functionalism, "Getting things that enhance your status. Like getting an upgrade of a car, because you want an upgrade of the car but you don't actually need a new car because your old car is broken." In terms of functionalism, Participant 2 summarized it as "uhm, case-by-case study, like, depends what your using it for, like your using it for work or it actually has a strong function for you, and I don't think it's out of necessity. Like I think you'd need that."

In summary, words that could potentially reflect anti-materialism are verbs, or action words, as the proverb goes, "Actions speak louder than words". The act of giving up something could be viewed as anti-materialistic, be it a tangible material object, or something intangible like effort and time. On top of that, the context is important to note, such as the function of purchasing the object in the first place. If it was to impress others, or just to have minor improvements, that could be viewed as being materialistic. Additionally, the idea of using close approximates of the opposites towards materialistic stimuli is a reflection of the materialistic mind-set of the researchers as the words are suggested. To conclude, the lack of context

provided did not make it easier for the participants to see the anti-materialistic stimuli from the intended perspective – anti-materialism.

Happy works but not sad for the stimuli used

The interaction plot from the results in Experiment 1 showed that there was a significant interaction between sample and target such that materialistic and anti-materialistic D-IRAP scores for “happy” and “sad” differed but those for the word “sad” did not. I therefore asked participants on their thoughts about using “happy” and “sad” when paired with the stimuli used in Experiment 1. One participant responded, “I’ll be fine and happy with just non-materialistic things.” and another participant mentioned:

Uhm, well, I think for me like, the words sad made it confusing, cause I think even not-materialistically I wouldn't be sad if I had wealth, I just wouldn't, like, define myself by that wealth or like, they wouldn't be happy but wouldn't be like, sad.

Essentially, participants mention that they will not be sad if they did not have material objects or are able to fulfil their materialistic tendencies, but they won’t be happy either. To put it in another sense, participants are saying that if they are unable to be materialistic (e.g., purchase item of desire), they won’t be happy, but they won’t be sad either. It was an assumption that participants who cannot fulfil their materialistic needs will be sad. In a different example, if one was poor and hungry, finding and consuming food would satiate that hunger and that could lead to feeling “happy”, however, if one could not find food to consume, one would not necessarily be “sad”. There could be the possibility that the person would just accept that hunger and just carry on, neither happy nor sad about the feelings of hunger. Going back to materialism, being able to purchase items would indeed elicit “Happy”, and that could explain why participants are more readily to react when the

word “Happy” is paired with materialistic or anti-materialistic stimuli as opposed to the word “Sad”.

MET training effects are too short

Participants agreed amongst themselves that the 10 min of training from MET, or lack of training for those in the Solitaire group, was not sufficient. I asked participants what they felt after 10 min of training, one participant identified themselves for doing 10 min of Solitaire instead, so that participant is from the Control group. These were the responses of participants from the Materialistic or Anti-Materialistic group:

Participant 1: *I only found that, when I walked away, I started, remembering that the sad side didn't make sense.*

Participant 2: *The uh, consistent did make sense. I don't whether that's because, that's, screamed at me through my television screen or radio all day and night. So you kind of clip on to those words and go...*

Participant 3: *in 10 minutes, when you know, they got this whole perspective that they've been developing for 18-20 years.*

Materialistic messages have been reinforced through media for many years, and therefore 10 min of training was not sufficient to change those networks. It is also not sufficient to reinforce anti-materialistic networks, which was also compounded by the issue that the stimuli used were not reflective of anti-materialism.

Awareness

During the experimental debriefing sessions, participants have reported on a type of “awareness” when they were completing the MET and IRAP, especially in the inconsistent, or anti-materialistic portion of the experiment. Participants speak of

the “awareness” as them considering other meanings when doing the IRAP and when filling out the MVS. For example, when doing the inconsistent block (be anti-materialistic), participants reported on thinking about materialism. This was again present when participants were filling out the MVS, they were considering other interpretations of the questions in the MVS, and whether they were or were not materialistic. In an attempt to get participants to discuss this “awareness” they reported, I first asked them if they thought the IRAP captured materialism and anti-materialism, or just materialism alone. One of the participant responded, and another agreed, “Captures materialism really well.” Participants all agreed that “Like materialism is so obvious, stand out.” With that premise established, I asked if they felt it was the same for anti-materialism, and one participant responded, “I think it has the same effect, just like, you don't react the same way to materialism as you do anti-materialism.” Another participant clarified that “I think we're just more aware of materialism than we are anti-materialism.” To summarize this theme, I put out the statement “There's no words to really describe anti is there?” and a participant responded with, “No. there isn't.”

From here, it was observed that the participants reported more strongly regarding this type of “awareness” when they were performing the anti-materialistic portion of the experiment. This awareness could have been present as well when they were filling out the MVS form at the end. To put it into the REC model's perspective, this “awareness” that participants report on could be them contacting the EERRs. While the MET and the IRAP was training the BIRRs, the participants are still free to contact the EERRs a few seconds later as they reflect through the process of them performing the experiment. When it came to completing the MVS form, given that it is an external measure and no time-pressure was given, participants would be contacting their EERR networks as they complete the MVS

form. In other words, putting this into a different perspective, for example, say the participant was doing the consistent block of the IRAP, which requires immediate responding, would be training their materialistic BIRRs, and during the feedback screen, participants will have time to reflect and look back at the trials they just completed. This looking back, or reflecting upon what happen would be participants contacting their EERRs, which can either be the materialistic or anti-materialistic networks, or even both of them. At the end of the experiment, when the participants are filling out the MVS form, they will be accessing the EERR networks more often as they are not under pressure to respond quickly, along with the lack of context to what constitutes as “anti-materialism”, participants will be thinking a lot harder when they answer the questions in the MVS, whether or not they are materialistic and this accessing of EERR networks could be the “awareness” that participants reported on.

Conclusion

In summary, participants agreed that the stimuli used in Experiment 1 were not fully reflective of Anti-Materialism, but agreed that they did reflect Materialism. Anti-materialism is not as clear cut as the “opposite of materialism”. The lack of context provided also compounded the participant’s interpretation of anti-materialism and therefore was not directly training the anti-materialistic BIRRs that was intended to be the target. Care is required when discussing what constitutes *anti-materialism* as there are many more variables at play in the interpretation of anti-materialistic scenarios. The results also showed that 10 min is not sufficient to override decades of materialistic training, but it did manage to raise “awareness” towards materialism and anti-materialism. This, in turn, caused participants to re-evaluate their EERRs regarding materialism as a whole and perhaps form new EERR networks about anti-materialism.

General Discussion

One of the concerns was whether the MVS had been used in a New Zealand population and there have been two previous studies that used MVS in New Zealand (Smith Speck & Roy, 2008; Watson, 1998).

Future studies could expand the population to include more participants from different walks of life, such as retirees, working-adults, teenagers, or younger children. Another possible future research would be to replicate this experiment with some changes, such as having participants fill out an MVS before and after the experimental procedure and compare the MVS scores to allow for a more precise measure of within-subject change in attitude.

As I have mentioned before, the IRAP D-score may be a better predictor of behaviour than IAT scores, and so far three studies, to my knowledge, (Carpenter, Martinez, Vadhan, Barnes-Holmes, & Nunes, 2012; Leech, Barnes-Holmes, & Madden, 2016; Nicholson & Barnes-Holmes, 2012) have investigated this. Two materialism studies have looked at correlating materialism with behavioural outcomes, such as observing children becoming more selfish after watching TV advertising (Goldberg & Gorn, 1978), and a lower score in the Prisoner Dilemma Game (Sheldon et al., 2000). A suggestion for future studies would be to correlate these D-IRAP scores with observable materialistic behaviours, such as changes in purchasing behaviour, credit reports or volunteering. In addition to that, it would be interesting to see if extended periods of MET training could potentially change the BIRR networks, such as across weeks or months. Cassidy, Roche, and Hayes, (2011) has shown that BIRR networks can change significantly after extended period of training.

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Appendices

Appendix A: Participant Information Sheet

Materialism and Implicit Attitudes

Information Sheet

My name is Stefan Lim and I am enrolled in the Masters of Applied Psychology (Applied Behaviour Analysis) course at the University of Waikato. It is my pleasure to invite you to participate in my experiment, designed to test the implicit attitudes around materialism using a computer-based assessment tool, the IRAP!

The Implicit Relational Assessment Procedure (IRAP) is a computer-based assessment tool that has been used extensively to measure pre-existing implicit attitudes (understood in this context as being implicit relational responding) which have been acquired through historical learning processes. Watching advertising throughout your life would have created extensive and implicit relations regarding material objects and the goal of obtaining them or how you view them will reflect as how materialistic you are. This research study aims to see if those implicit attitudes can be temporarily changed with a simple 10-minute training.

As an undergraduate, your participation may allow you to receive up to 1% of course credit (if available to you); those participants the experimental session and do not wish to receive course credit can opt to go into the draw to win one of three \$20 Warehouse vouchers instead.

As a participant you will be asked to:

- Attend one experimental session that lasts between 40-60 minutes.
- In the session, you will be tasked with a 10-minute training program.
 - After completion of the training program, you will be asked to undergo testing through the IRAP.
 - After the IRAP test, you will complete a Materials Value Scale (MVS)

As a participant your data will remain anonymous:

- After the experimental session any of the contact details used to schedule the time and date of your participation will be safely discarded along with your name and any other identifying information.
- Upon arrival at the computer lab you will be given a participant identifier – this identifier will be attached to your data report with no other form of identification being used.
- Consent forms and data sheets will be kept with the researcher for a period of one year after completion of the thesis – they will then be securely destroyed.
- If you opted to receive a summary of research findings, your email address will be stored on a file separate from your results.

As a participant your involvement is totally voluntary:

- You may withdraw from this experiment at any time.
- There is no academic requirement (or otherwise) for you to participate in this study.

If you have any questions regarding your involvement in this research please contact either the researcher, Stefan Lim, or his supervisor, Dr Timothy Edwards.

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This research project has been approved by the School of Psychology Research and Ethics Committee of the Faculty of Arts and Social Sciences, University of Waikato. Any questions about the ethical conduct of this research may be sent to the convenor of the Research and Ethics Committee (currently Dr James McEwan, phone 07 838 4466 ext. 8295, email: jmcewan@waikato.ac.nz)

Appendix B: Consent Form

CONSENT FORM (Appendix B)

A completed copy of this form should be retained by both the researcher and the participant.

Research Project: Materialism and Implicit Attitudes

Please complete the following checklist. Tick (✓) the appropriate box for each point.	YES	NO
1. I have read the Participant Information Sheet (or it has been read to me) and I understand it.		
2. I have been given sufficient time to consider whether or not to participate in this study		
3. I am satisfied with the answers I have been given regarding the study and I have a copy of this consent form and information sheet		
4. I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without penalty		
5. I have the right to decline to participate in any part of the research activity		
6. I know who to contact if I have any questions about the study in general.		
7. I understand that my participation in this study is confidential and that no material, which could identify me personally, will be used in any reports on this study.		
8. I wish to receive a copy of the findings If yes, provide email address:		

Declaration by participant:

I agree to participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Psychology Research and Ethics Committee (Dr James McEwan, Tel: 07 838 4466 ext 8295, email: jmcewan@waikato.ac.nz)

Participant's name (Please print): _____

Signature: _____

Date: _____

Declaration by member of research team:

I have given a verbal explanation of the research project to the participant, and have answered the participant's questions about it. I believe that the participant understands the study and has given informed consent to participate.

Researcher's name (Please print): _____

Signature: _____

Date: _____

Appendix C: Experimenter's Script

Experimenter's Script

Materialism and Implicit Attitudes

For all participants (regardless of condition): When participant arrives, greet them, introduce myself and ask them what their name is. Check the timetable to determine the participant's experimental condition and to confirm their details. Sit the participant in front of the desktop PC and give the participant their identity card and a consent form. Advise the participant that they are about to receive a consent form and an information sheet and there is no time limit to read and sign the consent form. If the participant is unwilling to sign the consent form, thank them for their attendance, remove all materials from the desk and show the participant the exit from the laboratory room. For participants who agree and want to continue with the experiment, load the training program relevant to the group (materialism/anti-materialism training/solitaire). Present the participant with verbal instruction regarding the training program and they should summon the experimenter if they require further assistance.

The written instructions for each condition are as follows

Multiple Exemplar Training (MET)

Materialism

You are about to take a computer-based training task which involves a combination of two words that are presented simultaneously on the screen. Your task is to state whether the words are true or false according to the given rule.

I'm going to train you how to do this task in stages, and when you've shown that you've learned how to do the task, I'll leave you to practice it.

In this study, we're interested in **materialism**. So, what is going to happen is that, at the top of the screen, you will see "**Happy**" and in the middle of the screen you will see a word such as "**trendy**", "**wealth**", "**basic**" and so on. This is called a trial.

You've got two response options at the bottom of the screen, one on the left and one on the right. Those response options are going to be "**True**" and "**False**", but will switch sides randomly. Whatever is on the left of the screen will always be the "D" key and whatever is on the right of the screen is always the "K" key.

You'll be given a series of trials one after another in what we call a block. After each block, you'll be given a break and some feedback on how you're doing.

What I'd like you to do is put a finger on the "D" key and a finger on the "K" key. The rule here is to respond AS IF **you are materialistic**. This task is essentially a pairing task where you have to follow this rule. Although this might sometimes feel odd or may be something you disagree with, following the rule is how this training is conducted. Let's do a few blocks for 10 minutes.

First error: The task will give you a red X if you get an answer wrong and will not proceed until you choose the correct answer. The goal of this program is to train you to respond as accurately as you can AS IF you are materialistic.

After first block: You can see here at the end of a block of trials, the program gives you some feedback. Here is the graph that shows your accuracy and a time record of your average response speed across the block. I'd like to concentrate on your accuracy, the goal is to follow the rule accurately on every trial.

After second block: Here you can see the graph changed and again the time trial is displayed. The goal here is to respond as accurately as possible.

Anti-Materialism

You are about to take a computer-based training task which involves a combination of two words that are presented simultaneously on the screen. Your task is to state whether the words are true or false according to the given rule.

I'm going to train you how to do this task in stages, and when you've shown that you've learned how to do the task, I'll leave you to practice it.

In this training, we're interested in *anti-materialism*. So, what is going to happen is that, at the top of the screen, you will see "**Sad**" and in the middle of the screen you will see a word such as "*trendy*", "*wealth*", "*basic*" and so on. This is called a trial.

You've got two response options at the bottom of the screen, one on the left and one on the right. Those response options are going to be "**True**" and "**False**", but will switch sides randomly. Whatever is on the left of the screen will always be the "D" key and whatever is on the right of the screen is always the "K" key.

You'll be given a series of trials one after another in what we call a block. After each block, you'll be given a break and some feedback on how you're doing.

What I'd like you to do is put a finger on the "D" key and a finger on the "K" key. The rule here is to respond AS IF *you are anti-materialistic*. This task is essentially a pairing task where you have to follow this rule. Although this might sometimes feel odd or may be something you disagree with, following the rule is how this training is conducted. Let's do a few blocks for 10 minutes.

First error: The task will give you a red X if you get an answer wrong and will not proceed until you choose the correct answer. The goal of this program is to train you to respond as accurately as you can AS IF you are anti-materialistic.

After first block: You can see here at the end of a block of trials, the program gives you some feedback. Here is the graph that shows your accuracy and a time record of your average response speed across the block. I'd like to concentrate on your accuracy, the goal is to follow the rule accurately on every trial.

After second block: Here you can see the graph changed and again the time trial is displayed. The goal here is to respond as accurately as possible.

Control

You are about to take a computer-based task which involves sorting cards into their respective piles in ascending order. This game is called *Solitaire*. If you are familiar with the task, you can proceed to play the game.

If you are unfamiliar with the game, we can do a few trials together until you get the hang of it. Then you will proceed to play the game on your own.

IRAP

From MET: Okay. Now you will take a computer-based task that is similar to what you have done previously. The rules are the same, respond as accurately and as quickly as you can. Let's start with a few more training trials and I'll explain the difference as we go through.

Here we have is an inconsistent block. In this block of trials, you have to respond opposite to what you have learned. As a reminder, like the previous blocks, you have to respond as accurately as possible.

Second pair of practice blocks: Here you have are a new pair of practice blocks. You now have an added element, to respond quickly. **An exclamation mark** will appear at the bottom of the screen if you take more than **2 seconds** to respond on any trial. Remember though that accuracy should not be sacrificed for speed; you will find that you will naturally be quick when you are accurate and not the other way around.

If you see a few consecutive red Xs, this means that you are going too fast. Slow down and get the rhythm of responding correctly.

From Control: You are about to take a computer-based training task which involves a combination of two words that are presented simultaneously on the screen. Your task is to state whether the words are true or false according to the given rule.

I'm going to train you how to do this task in stages, and when you've shown that you've learned how to do the task, I'll leave you to complete it.

In this study, we're interested in **materialism**. So, what is going to happen is that, at the top of the screen, you will see "**Happy**" or "**Sad**" and in the middle of the screen you will see a word such as "**trendy**", "**wealth**", "**basic**" and so on. This is called a trial.

You've got two response options at the bottom of the screen, one on the left and one on the right. Those response options are going to be "**True**" and "**False**", but will switch sides randomly. Whatever is on the left of the screen will always be the "D" key and whatever is on the right of the screen is always the "K" key.

You'll be given a series of trials one after another in what we call a block. After each block, you'll be given a break and some feedback on how you're doing.

What I'd like you to do is put a finger on the "D" key and a finger on the "K" key. The rule here is to response AS IF **you are materialistic**. This task is essentially a pairing task where you have to follow this rule. Although this might sometimes feel odd or may be something you disagree with, following the rule is how this training is conducted

First error: The task will give you a red X if you get an answer wrong and will not proceed until you choose the correct answer. The goal of this program is to train you to respond as accurately as you can AS IF you are materialistic

After first block: You can see here at the end of a block of trials, the program gives you some feedback on how you're doing. I'd like to concentrate on your accuracy, the goal is to follow the rule accurately on every trial.

On this next block is an inconsistent block. In this block of trials, you have to respond opposite to what you have learned. So the rule now is to respond AS IF **you are anti-materialistic**. As a reminder, like the previous blocks, you have to respond as accurately as possible.

Second pair of practice blocks: Here you have are a new pair of practice blocks. You now have an added element, to respond quickly. **An exclamation mark** will appear at the bottom of the screen if you take more than **2 seconds** to respond on any trial. Remember though that accuracy should not be sacrificed for speed; you will find that you will naturally be quick when you are accurate and not the other way around.

If you see a few consecutive red Xs, this means that you are going too fast. Slow down and get the rhythm of responding correctly.

When participants meet the criteria

Great! You've shown that you have learned how to do the task. I'll let you complete this task now. The task itself is exactly the same as the practice was. The program will remind you what the new rule is before each block and you'll do 6 blocks in total. You will need to respond with **>80%** accuracy and faster than **2000ms**. You'll still be given feedback after each block so that you can see how you're doing. If you find your scores have dropped, you can take a break and try to get your accuracy up to **>80%** and speed up to **<2000ms**.

NOTE: THINGS PARTICIPANT SHOULD NOT BE TOLD.

In order to maintain task integrity, participants are not to be told which blocks they might find easier or more difficult. This means to not let them know which blocks are consistent and which are inconsistent with their biases.

- Should a participant raise this issue, respond by telling them some participants do report that one or more blocks are easier/harder but the important thing is to go as accurately and as quickly as possible on all blocks.

When participants do not meet the criteria

Participants who do not meet the **>80%** accuracy and speed faster than **2000ms**, the researcher will close the IRAP program and reopen it and allow the participant to jump directly into the 6 test blocks. When the participants are done with the task, they proceed to taking the MVS scale.

MVS

Great. Now that you've completed the IRAP, one final task for this session is to fill out this questionnaire. Here is a pen, and once you've completed it, summon me and you are free to go.

Thank you for your time.

Appendix D: Materials Values Scale (MVS)

MATERIAL VALUES SCALE (MVS)

Citation:

Marsha L. Richins (2004), The Material Values Scale: Measurement properties and development of a short form, *Journal of Consumer Research*, 31, 209-220.

See also: Marsha L. Richins and Scott Dawson (1992), "A Consumer Values Orientation for Materialism and Its Measurement: Measure Development and Validation," *Journal of Consumer Research*, 19 (December), 303-316.

Scoring:

Scoring values are: SA=5

A = 4

N = 3

D = 2

SD=1

except for reverse scored items, which are items 3, 6, 7, 10, 14, and 15

Subscales:

Success – items 3, 5, 9, 12, 13

Centrality – items 2, 4, 7, 10, 15

Happiness – items 1, 6, 8, 11, 14

For further information about subscales, short versions of the scale, and the psychometric properties of the MVS, see Richins (2004).

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ATTITUDE SCALE

Indicate how much you agree or disagree with the following statements by circling the answer that best represents your feelings.

Strongly Agree SA	Agree A	Neutral N	Disagree D	Strongly Disagree SD
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- | | | | | | | |
|-----|--|----------|---|---|---|----|
| 1. | I'd be happier if I could afford to buy more things. | SA | A | N | D | SD |
| 2. | I like a lot of luxury in my life. | SA | A | N | D | SD |
| 3. | I don't place much emphasis on the amount of material objects people own as a sign of success. | SA
SD | A | N | D | |
| 4. | Buying things gives me a lot of pleasure. | SA
SD | A | N | D | |
| 5. | The things I own say a lot about how well I'm doing in life. | SA | A | N | D | SD |
| 6. | I have all the things I really need to enjoy life. | SA
SD | A | N | D | |
| 7. | I put less emphasis on material things than most people I know. | SA
SD | A | N | D | |
| 8. | My life would be better if I owned certain things I don't have. | SA
SD | A | N | D | |
| 9. | I admire people who own expensive homes, cars, and clothes. | SA
SD | A | N | D | |
| 10. | The things I own aren't all that important to me. | SA
SD | A | N | D | |
| 11. | It sometimes bothers me quite a bit that I can't afford to buy the things I'd like. | SA
SD | A | N | D | |
| 12. | Some of the most important achievements in life include acquiring material possessions. | SA
SD | A | N | D | |
| 13. | I like to own things that impress people. | SA
SD | A | N | D | |
| 14. | I wouldn't be any happier if I owned nicer things. | SA
SD | A | N | D | |
| 15. | I try to keep my life simple, as far as possessions are concerned. | SA
SD | A | N | D | |

Appendix E: Focus Group Prompts

Focus Group Prompts

Part 1: Show the participants the stimulus used in the IRAP

- 1) What does *materialism* mean for you
 - a. Do these stimuli encapsulate materialism for you?
 - b. What comes to mind for you that reflects materialism?
- 2) What does *anti-materialism* mean for you
 - a. Do these stimuli encapsulate anti-materialism for you?
 - b. How else might you think about anti-materialism?
- 3) What are your thoughts for the stimulus during the consistent blocks
- 4) What are your thoughts for the stimulus during the inconsistent blocks
- 5) Do you have any insights, or comments, to make about your experience of completing the IRAP on materialism? Is there anything that stood out as being particularly difficult? Easy? What was the easiest thing? The hardest thing?

Part 2: Reveal that the data shows MET training predicts opposite effects (ie: Mat MET = anti-materialism and Not MET = materialism).

- 1) What are your thoughts regarding the data?
- 2) Do you think that the IRAP captures materialism/anti-materialism?
Elaborate.