

## **Title**

### **Using implicit metrics to audit and reduce or manage unconscious bias in organisations**

## **Abstract**

The equality, diversity and inclusion (EDI) industry is at a watershed. Increasingly difficult fiscal conditions are directing scrutiny at traditional diversity interventions such as policy development and training. Despite a significant research effort and organisational spend, little appears to have delivered in terms of reducing the presence of prejudice in people's working lives (Paluck and Green, 2009). This paper argues that this is because traditional interventions make assumptions about the nature of prejudice as a conscious process. The paper explores the potential for tapping into our unconscious biases (prejudices) as a method of targeting interventions, and examines ways in which our unconscious biases can be measured with a new psychometric test called *Implicitly*. It uses neurological evidence and neuroplasticity methods, offering an alternative to traditional diversity training to make staff diversity literate and culturally intelligent (Hannum et al, 2010). The ethical and legal issues of implementation of unconscious bias metrics are discussed.

*Key words: Unconscious Bias, Prejudice, Implicit Association Test, Implicitly, Cultural Intelligence, Diversity Literate, Neurology of Bias, Diversity Training, Neuroplasticity.*

## Introduction

Exploring prejudice and prejudice reduction within an organisational context has the potential to be the longest, most depressing and most frustrating research paper at this event. It may be the longest because of the sheer volume of research already, and still being produced. It may be the most depressing because recent reviews (see Paluck and Green, 2009) suggest that despite this gargantuan research effort there is little or no evidence that researchers and organisations have been able to translate this knowledge into effective workplace practice in terms of attitude change. Finally, it may be frustrating because the cycle of *research-law-policy-intervention* continues to fail so spectacularly in addressing the underlying attitudes this cycle seeks to impact. This may be because the cycle assumes that the problem is like others encountered by researchers, legislators, policy makers, assessors, managers, trainers and coaches; one dealing only with the conscious domain and impacted by our directed intent, skill or awareness. This leads us to adopt methods which seek to change attitudes through conscious and logical processes, with spectacularly disappointing results. Entire equal opportunity and diversity strategies and policies are developed assuming people choose to be prejudiced, or at least can choose, be trained, coerced or forced not to be. This approach is based on a basic and faulty assumption: that we are in conscious control of our biased intentions and behaviours. Recently some prominent scholars (see Review by Tetlock and Mitchell, 2009) have challenged the conventional notion that anti-discrimination norms, backed by legal sanctions, can prevent or reduce unconscious prejudice. Objective inequalities continue to impress into our minds "*subjective associations that inevitably contaminate personnel judgments that require the exercise of discretion.*" (Tetlock and Mitchell, 2009).

There is an urgent need for those of us working in Equality Diversity and Inclusion (EDI) to do better. As workplaces and customers have become more diverse, as national boundaries have become less of a barrier to the movement of people, and as the legislative framework defending personal diversity and liberty has strengthened all employees need to be more culturally intelligent and diversity literate. Culturally intelligent in being able to understand and adapt to a myriad of cultural contexts (Van Dyne et al., 2010) and diversity literate in terms of being able to be alert to and able to read the behavioural drivers of themselves and others. This paper seeks to offer an alternative perspective in terms of the research, policy and intervention; that prejudice is largely unconsciously developed and driven, and that this

requires research methods, law, policy and interventions which recognise this more fundamental driver of our behaviour.

Research interest in prejudice (and prejudice reduction in particular) has accelerated and although this research has extended our knowledge of what prejudice is and how it may operate, when compared to the political and legislative impacts it appears to have delivered little in terms of supporting the real world change to address the impact of prejudice on people's lives, including their working lives. Even the progressive and pervasive influence of legislation and organisational policy have done little or nothing to address the underlying problem of prejudiced attitudes. Indeed one might argue that knee-jerk and poorly thought through laws and inept policy implementation have actually worsened the real problem and frustrated attempts to address the key issues by making the subject an organisational taboo.

In his 1954 book, *The Nature of Prejudice*, Allport (1954) noted that white people in the United States (US) lived in a state of conflict. On the one hand they were ideologically opposed to prejudice, but they also possessed the underlying tendency to think and act in racially biased ways. Living with a tension and dissonance between overt egalitarian beliefs and the reality of our prejudiced behaviour is thought to be possible because we have a social bias blind-spot; believing bias exists only in others and because many of our biases operate unconsciously, below the level of both our conscious attention and control (see Devine 1989). By not allowing our biases to be raised to our consciousness, through a lack of self insight and this bias blind-spot (Pronin, Yin and Ross, 2002) we avoid this dissonance. To date unconscious bias has received little attention and even less use as a tool in organisational intervention, as a method of making staff more diversity literate or in helping measure the impact of interventions. Unless we are able to measure our biases, we will always struggle to manage them and the need for a robust metric has held back the development of impactful prejudice reduction interventions.

This paper intends to look at traditional definitions of prejudice, but also at its neurological base within the structures and processes of the brain, drawing on Functional Magnetic Resonance Imaging (fMRI) and Event Related Potential (ERP) evidence. It will look at the nature of our unconscious biases and detail the development of a new metric to access our unconscious biases as a means of targeting bias reduction or management interventions.

## Defining and redefining prejudice

It is not the intention in this paper to discuss the many and sometimes competing definitions of prejudice and the underpinning theories. Indeed, in sections of this paper we recognise the emotive nature of even using the word 'prejudice' and use the word 'bias' instead. What the research tells us is that evocation of word such as 'prejudiced' in feedback activates the very prejudice we are seeking to measure, manage and reduce (Richeson et. al., 2003). In organisational settings, where the stakes are often high in terms of our jobs and careers, the word *prejudice* invokes historical, political and social connotations which do little to garner support for the work necessary to attempt prejudice management and reduction work. Prejudice has become something of an organisational taboo because;

1. The social stigma of being 'prejudiced' has led us to a place where nobody dare admit to themselves, let alone others, that they may have a prejudice
2. Nobody dare declare to their organisation that they have a personal prejudice for fear of sanction or censure
3. Policy makers and managers in organisations feel threatened by staff making this disclosure because they feel ill equipped to deal with it, recognise the risks this exposes for the organisation or recognise that any exploration may reveal their own social prejudices
4. Organisations are ill equipped to support staff making this disclosure (other than remedial diversity training)

Although we must and will discuss the relationship of prejudice with stereotyping and behaviour a more important issue at this point in terms of practicality and the thrust of this paper is the distinction made by Devine in her seminal paper in 1989, between intergroup bias in two distinct forms: controlled and automatic. Controlled bias is conscious, intentional and deliberate. This is the default position underpinning much organisational intervention. Automatic bias is unconscious, rapid and often unintentional. This distinction is important because research, policy and law has tended to focus only on the concept of conscious controlled bias with much less regard for unconscious, uncontrolled bias. Yet compared to unconscious information processing, conscious processes are much smaller and much less efficient. Zimmerman (1989) and later Norretranders (1998) reported that human brains can consciously process around 45 bits of information (equivalent to a few words) per

second and just 30 bits when reading aloud. When two numbers are calculated by mental arithmetic, this falls to just 12 bits per second. The unconscious capacity dwarfs this. Unconsciously it is possible to process over 10 million bits per second, meaning the unconscious is 200,000 times more powerful (Norretranders, 1998).

The word *Prejudice* comes from the Latin noun *praejudicium*; to damage. By definition prejudice is a prejudgment or opinion formed before or without knowledge or examination of the facts. A prejudice can be positive or negative, as people can make prejudgments which are affirmative or disapproving. However, in practice, prejudice is more often seen as having a negative frame, in line with the original Latin noun:

*...an antipathy based upon a faulty or inflexible generalisation. It may be felt or expressed. It may be directed toward a group as a whole or toward an individual as a member of that group* (Stangor, 2000).

The strength of our negative feeling is important because it is suggested that while ambivalence or the lack of positive emotions are related to prejudice (Stangor 2000), stronger negative emotions are related to the behavioural component of the attitude: *discrimination*. Support for this is seen in Glick and Fiske (1996) who looked at benevolent versus hostile sexism. They suggested that hostile sexism is triggered when women occupy roles that challenge traditional gender roles, leading to hostile discrimination and that when sexism is more benevolent (for example when the roles were more traditionally congruent) hostile behavior is less evident.

Based upon a review by Nelson (2006) of the various attempts to define prejudice Nelson highlighted four key points in defining prejudice:

1. It occurs between groups
2. It is an evaluation ( + or -) of a group
3. It is a biased perception of a group
4. It is based on real or imagined characteristics of the group

Leading from this, Nelson (2006) suggested that prejudice should be defined as "*a biased evaluation of a group based on real or imagined characteristics of the group member*".

Prejudgments become prejudices when they are not impacted by new information or perspectives, and this alludes to one of the difficulties of prejudice; that it is resistant to change. Stangor's definition shows that people are mainly concerned with negative prejudices rather than positive prejudice, because the impact of negative prejudice is much more damaging. However, to complete the definition of prejudice it is necessary to add one more feature, involving two key components. Prejudice has both attitudinal and belief based components. A person has an attitude of favour or disfavour, and that is based on a set of beliefs. Beliefs have a tendency to change when confronted with counter evidence, but can often simply adapt to justify the continuing biased attitude, in order to remain congruent.

## **Categorisation**

Allport (1954) used the term "the normality of prejudice" to describe the process that occurs when an individual interacts with other people: the abundant information available to them is suppressed and placed into categories. Social psychologists call this phenomenon 'social categorisation', whereby people routinely sort single objects into groups rather than think of each as unique. The advantage of categorisation is that it allows people to save time and effort when processing information about others, thereby allowing them to pay attention to other tasks or information with their limited processing resources. Categorisation has a useful social function. For example, when a person goes to the doctor it is important that the patient recognises how doctors are likely to behave (ask questions, carry out an examination, make a diagnosis). The doctor expects the patient to answer questions, and to comply with directions (such as undressing when asked; this is one of the few occasions when most people do this without question). Without this prejudice social encounters would become very stressful and complex as both parties seek to establish roles and expectations of the other. Allport sees prejudice as both normal, and to be expected as the default position.

People form categories and expectations of others and of other groups of people based on their prior experience, but also from what they have seen and heard, some of which they absorb unconsciously during the course of their lives. They create thinking styles which are stereotypes of the group. The disadvantage is that this categorisation can then guide the actions of a person towards another on the assumption that the other person possesses traits included in the stereotype associated with the group under which they are

categorised. Often the stereotype is accurate (Nelson, 2006), but it can also be wrong. The ways in which each person's categories are formed are substantially influenced by what they have heard from their parents, been told by friends, or have encountered through limited experience with other groups. Quaflied et al (2009) showed that the brain's left amygdala is responsible for initiating the reaction to learned (experiential) responses and the right amygdala is responsible for the instructed (learned from others) response, a functional polarisation unique to humans.

Each person's categories give rise to their own personal set of values. These are categories which require very little thought and people are likely to affirm and defend them fervently. People protect their closely held values, which they share with others who are similar to them and which in turn shape their way of life. Each person's own identity is formed by their various group memberships, with whom they are likely to share values. An attack on the categories in which people group themselves is an attack on their values, and is therefore an attack on their intrinsic notion of who they are. The human instinct is to value, support and defend those who are like oneself. This is the 'love prejudice', which can lead to the rejection of those who are dissimilar. This process of affirming values and those who share them leads people, as Stangor (2000) says, "to the very brink of prejudice" and, as Fiske (1998) notes, in initial perceptions this categorisation or prejudgment is both "immediate and pervasive".

Once formed, these prejudgments (and in particular negative prejudgments) are fiercely protected against change. If a new situation or person is encountered that clearly does not conform to a particular prejudgment, people tend to 're-fence' or re-categorise the event or person as 'atypical' in order to protect their original categorisation from having to change. For example, if someone has a perception of older people as being frail and unintelligent but then meets an octogenarian who is physically strong and intellectually sharp, they may re-categorise that person as atypical of older people in order to protect their simpler categories, even though there are many people of that age who are fit and alert. Even memory works to protect these categories by recalling facts which support the categories, and conveniently forgetting or losing facts which contradict the category. The relationship between stereotypes, attitudes and discriminatory behaviour is integral to the conceptual framework. It is important to understand the processes by which a stereotype is formed or is driven by an attitude, and how that impacts on how people feel, and ultimately how they behave.

## Stereotypes

The word 'stereotype' was first used in 1922 by the journalist Walter Lippman to describe the cognitive and behavioural patterns of humans (cited in Stangor, 2000). Until then it had been a term used in the printing industry to describe a process whereby fixed casts are produced. Today, 'stereotype' is used by social scientists and the public alike to describe the construction of a conventional, formulaic and over-simplified conception, opinion or image of other groups. This impression about a group or individual is often based on limited knowledge of that group or individual. Stereotypes are important because the associations which people may hold about, for example, other ethnic groups are often based on limited and restricted experience. Researchers examining stereotype believe that the two constructs of 'stereotype' and 'attitude' are closely related. There are three explanations as to why there is a close relationship between stereotypes and attitudes:

- 1 *Stereotype Primacy* puts forward the idea that a behavioural component of an attitude is an inevitable consequence of stereotyping (Billig 1985). In other words, the two are so closely connected that one drives the other. Nesdale and Durkin (1998) are of the opinion that negative feeling (affect) associated with the content of the stereotype effectively comprises or underwrites the prejudices.
- 2 *Attitude Primacy* postulates that stereotypes are cognitive accompaniments of the feelings toward the members of a particular social group. Research has shown that attitudes or prejudices are acquired by children prior to stereotypes (Aboud 1988) which suggests that the prejudice is more fundamental and that stereotypes arise from intrinsic underlying prejudice.
- 3 *The Component View* of attitudes. Here, attitudes are thought to have three components: behavioural, affective and cognitive. This theory goes back to the time of Plato and suggests that a stereotype represents the cognitive element of the attitude (what people think of another group). The other two components impact on behaviour more directly; the affective component is thought to be 'prejudice', and the behavioural component is seen as 'discrimination'. Attitudes are therefore comprised of cognitive (beliefs), affective (feelings), and behavioural (action). Some writers have conceptualised stereotypes as being the cognitive component of an attitude toward an

out-group, with attitude also consisting of affective and behavioural components (Eagly & Mladinic 1989). This third position is the one that most researchers now support.

Most social psychologists now regard stereotypes as an inevitable outcome of adaptive cognitive processes, as individuals seek to simplify and organise the abundance of information potentially available in a diverse and complex social environment (Allport, 1954; Dovidio & Gaertner 1993; Tajfel & Forgas 1981).

This idea of the three component model has become prevalent in attitude research. However, it is now seen as a hierarchical model that includes cognition, affect and conation (behaviour) as first order factors, and attitude as a single second order factor (Rosenberg and Hovland, 1960). The three components make up the single attitude construct. The basic assumption is that attitude is a second order factor of the three first order components. If that is the case, then the three components should be correlated, and research shows that they do indeed vary together.

Meta-analysis by Dovidio et al (1996) confirms that stereotyping and prejudice are strongly related. One explanation for this link offered by Dovidio et al is that people crave consistency. It is important to people that their behaviour, beliefs, how they feel and how they think are aligned, because if they are forced to behave in a way which conflicts with their beliefs, feelings or thoughts it makes them uneasy. People are disposed to be in balance, with their thoughts, feelings and behaviour supporting each other. To redress any imbalance, people either have to change the way they think or feel, or the way they behave in order to restore the balance ( so called 'balance theory' or 'cognitive dissonance'; Festinger, 1964). Therefore, if people are predisposed towards holding cognitive stereotypes (conventional, formulaic and over simplified conception, opinion or image, often of other groups) it is cognitively efficient to use these as the basis for making decisions about other people and to behave towards them in a way that is consistent with that stereotype.

Prejudice can be based on affective, cognitive or behavioural sources, but it is generally acknowledged that the affective domain and negative feelings about other groups are the main source of prejudice and the driving force of behaviour in the form of discrimination. The strength of feeling is important because it is suggested that while ambivalence or the lack of positive emotions are related to prejudice (Stangor 2000), stronger negative

emotions are related to the behavioural component of discrimination (a willingness to act against the other person rather than just feel or think).

When Abrams and Houston (2006) reanalysed data from UK Government research which asked confidentially and explicitly about our own prejudices towards other groups such as immigrant communities, other ethnic groups, disabled people and gender groups people still expressed a good deal of overt prejudice. For example, 10% of people admitted prejudice towards Black people and over 20% admitted bias towards Gay/lesbian people. Kandola (2009) suggests that this explicit bias may only be the tip of the iceberg, and that many of us may harbour unconscious prejudices which impact our daily behaviour and decision making, but which operate below the level of our consciousness such that we continue to see ourselves as 'fair' (Pronin et al., 2002). We see prejudice as vested in others but not ourselves as this protects our fundamental self perception of being 'fair'. This implicit social bias and our own bias blind spot is often not open to introspection, but act insidiously to impact our decision making.

There is plentiful evidence that associations are triggered with minimal cognitive demand (Bargh, Raymond Chaiken & Hymes, (1996); Cunningham, et al (2004) (2004)). Usually we are obliged to respond in the absence of both time and cognitive resources and this can lead to bias impinging upon our actions (McCrae and Bodenhausen, 2000). Although Devine (1989) sees implicit bias as inevitable and disassociated from our conscious processes there are individual differences in activations suggesting that either we can, or at least some of us can exert some control or that activation is not inevitable. Gilbert and Hixon (1991) suggested that when individuals are placed under cognitive load (for example with a counting task) that the stereotypes are not activated. However, Spencer et al (1998) showed that activation was likely to occur even when under load if the situation had social meaning for the actor. If focally relevant categories are activated such that people are motivated to care about a situation then the stereotype is activated (see also Bodenhausen and McCrae, 1998; McCrae, Bodenhausen and Milne, 1995 and Quinn and McCrae, 2005). Focusing attention to one aspect of a target tends to activate different stereotypes. For example whether an Asian female photograph showed the woman with chopsticks or applying make-up predicted whether they would use the 'Asian' or 'woman' stereotypes and showing young Black men in church or urban settings produced differential stereotype activation (Wittenbrink, Jude and Park, 2001). Even the roles within a context activate

different stereotypes, for example between when a Black male was shown as the lawyer or the prisoner.

### **Unconscious (implicit) bias**

The focus of this paper now shifts decidedly toward unconscious or implicit bias, distinct from conscious and explicit bias (Devine, 1989). Much of the research to date has been around explicit conscious bias, or at least an assumption of some degree of introspection and self awareness of being prejudiced. We turn now to the evidence that the processes of social categorisation are automated and drive our behaviour without our conscious or deliberate control. These automatic and uncontrolled biases are also known as implicit (as opposed to explicit) biases.

Both implicit and explicit measures can have a claim to predictive validity in that they predict action (Poehlman et al., 2007) but implicit and explicit measures do reflect distinct psychological processes ( Devine, 1989). For example, in Gawronski and Bodenhausen (2006) using an indigenous stereotype task, respondents showed stronger associations of *America* with *White Americans* compared to *Native Americans* on an implicit association test (Greenwald et al, 1998) . Explicitly, however, respondents reasoned that Native Americans should be considered more American, presumably because of historical knowledge, and explicitly made the opposite judgment. The associative (implicit) judgment and the proposition (explicit) judgment differ (Devine, 1989) and mental associations are triggered independently of any explicit conscious endorsement of the stereotype (Gawronski and Bodenhausen, 2006). Kandola (2009) suggests that this explicit bias may only be the tip of the iceberg, and that many of us may harbour unconscious prejudices which impact our daily behaviour and decision making, but which operate below the level of our consciousness such that we continue to see ourselves as 'fair' (Pronin et al., 2002). We may see prejudice as vested in others but not ourselves as this protects our fundamental self perception of being 'fair'. This implicit social bias and our own bias blind spot is often not open to introspection, but act insidiously to impact our decision making.

## **The neurology of unconscious bias**

The physiology and neurology of the cognitive processes of bias have, until recently, been inaccessible and much of the evidence we have gathered has been indirect; behavioural shadows of the cognitive processes which instigated them. Unconscious bias is based on the notion that categories are spontaneously activated and develop as a result of our exposure to the attitudes of others, images and stereotypes throughout our lives from an early age. They impact our behaviour because of associations we develop between groups (e.g. women or gay men) and evaluative constructs, for example 'women-dependent' or 'gay men-promiscuous'. Once we establish automatic biases they begin to function unconsciously, rapidly and without recourse to the resources required by the more demanding mental processes typified by our conscious control processes. Such unconscious bias acts whether or not we have any regard for the truth or validity of the association driving the bias. These associations and their contingent biases are likely to be activated every time we encounter a group member, even if we consciously think and state that most women are independent and most gay men are not promiscuous. Once activated, which happens with little cognitive load, they exert influence over our information processing in the direction of our association. For example, when we encounter a person with whom we have associations, any ambiguity in the encounter will be interpreted in line with those associations. They also produce spontaneous behavioural effects such as colder, less friendly nonverbal reactions ( e.g. Gawronski and Bodenhausen, 2007; Strack and Deutch, 2004). With the luxury of time and attention it may be possible for people to consciously consider their reactions but the speed and pervasive influence of the unconscious bias is such that the impulsive automatic reaction has often already become behaviour. The impact may not always be strong enough to be overt nor lead to legal censure but can often be 'micro-behaviours' (or micro-inequities) such as giving less eye contact, taking less interest in and feeling less comfortable with some groups of people (Thiederman, 2008).

The normality and automation of prejudice is particularly vigilant in situations when strong emotions are evoked, or where the behaviour and appearance of the people involved is very different to one's own. Stenner (2005) supports a view that the strongest responses, amongst people with an authoritarian perspective, are activated by the threat induced by any major difference and by a lack of group cohesion. Brain imaging scans have demonstrated that when people are shown images of faces that differ in ethnic origin to themselves, it activates an irrational prejudgment in the brain's alert system for danger; the

amygdale. This triggers the fight or flight response at a biological and chemical level. The brain is constantly alert to messages from the amygdale which are inconsistent with our egalitarian ideals, and these monitoring processes operate at about 100ms. They are supported by regulatory processes which, recognising the mismatch between intent and desire, are able to override or mitigate the response. It is thought that those who allow their instincts to become behaviour have poor regulatory processes feelings are not regulated to avoid an adverse reaction to a perceived threat. This reaction is thought to be mediated by spindle cells (von Economo neurons) in the Frontal Insular Cortex (FC) and the Anterior Cingulate Cortex (ACC) (see also Quadflieg et al, 2009 for an overview of the role of the anterior cingulate cortex). Research has shown that humans are unique in both the number and size of these neurons which predisposes humans to social interaction. These neurons facilitate the rapid social decisions about others and are part of what constitutes being human; an empathetic response. Their malfunction has been shown to lead to distortion in the processing of emotions, for example in autism.

Work by Davis (1992), Kapp, Pascoe and Bixler (1984) and LeDoux (1992) have shown that the brain's amygdale are critical for the instructed fear response that is unique to humans. We are able to learn by simply being instructed and without having our own experiences, which we do not see in other animals. fMRI scans have shown that although it takes around 300 milliseconds for the senses to perceive and process a new sight, unconscious processes are triggered at around 80 milliseconds, before the picture has even been consciously registered by the eyes. In fact this assessment is even more rapid for faces, and has been shown to start as quickly as two milliseconds (Murphy and Sajone, 1993; Niedenthal, 1990; Ohman, 1986). This data has converged with the behavioural research findings that automatic evaluation is spontaneous and incredibly fast.

It should be noted at this point that the vast majority of the research in this area has been directed at prejudice based on ethnic origin (race). Although there have been recent studies involving other types of social stereotyping ( e.g. gender by Quadflieg et al., 2009), much of the research on implicit attitudes is from the Project Implicit programme at Harvard University in the United States, where issues of race have been uppermost in researchers and research sponsors' minds since the 1950's. However, research looking at other categories (such as gender) is consistent with the findings on race including the recent evidence from Quadflieg et al (2009).

The idea that prejudices are disassociated from our conscious mental processes and operate automatically in our subconscious processes is supported by further functional magnetic resonance imaging ( fMRI) (Cunningham et al., 2004; Phelps et. al 2000). The activations of the amygdale are correlated with the strength of people's evaluative group-based associations. Further evidence from neuroscience confirms that that the medial prefrontal cortex has a role in mediating the effect of the amygdale, and also in the development of social stereotypes (Mitchell, McCrae and Banaji, 2006; Quadflieg et al., 2009).

There is also evidence from data gathered from Event Related Potential (ERP) measures which measure the electrical activity of the brain and uniquely afford insight to the ordering of temporal processes within the brain. ERP uses the average electrical activity at the scalp from synchronous and summated firing of neurons. It produces a function of voltage and time of the deflected waveform thought to represent discrete stages of information processing (Gehring, Gratton, Coles and Donchin; 1992). Convention names waves as either Positive (P) or Negative (N) dependent upon the direction of deflection, followed by a number indicating the approximate millisecond count at the point of appearance. For example a deflection of N100 is a negative wave appearing after 100ms and a P300 waveform is a positive deflection after 300ms. These waveforms can deliver measurement to the millisecond. Using these waveforms the sequence and duration of the various stages of processing in the social categorising process can be examined, from visual attention to group membership, through the activation of stored beliefs and to the integration of multiple information sources (decisions making) to drive behaviour. Crites et al. (1995) noted ERP wave forms were seen when people were trying to manage the impression they were giving, and thought they may be related to the regulatory processes. The seminal paper in this area is Mouchetant-Rostaing, Giard, Bentin Agurn and Pernier (2000). They noted an ERP waveform at 145ms related to gender identification ahead of a second P200 waveform at 180ms irrespective of the classification task attempted. A negative N100 waveform was seen in classifying other-group faces at 122ms suggesting the more rapid processing of socially salient or threatening groups. Subsequent studies have found the same patterns (e.g. Williadson-Jenson, Ito and Park, 2007) confirming this suggestion. Processing attention appears to be directed initially at any out group member, followed with a P200 waveform so that a group who pose a threat produce a N100, then a P200 waveform. There is a N200 waveform indicative of more in-depth processing of the initial N100 reaction and a further deflection 250ms after the N100 and P200 waves have disappeared. The Race waveform (invoked by a race out-group face) and Emotional wave

forms (for example invoked by an angry face) are independent of one another. Ambiguous race faces (not clearly an in or out group) are processed as if they were own group faces with a P200 and N200 wave suggesting an over-inclusion effect probably because there are some in group features. Ito et al (2004) suggests that a P300 wave is seen which is related to the desire to be seen as unprejudiced (correlating with the score on the Modern Racism Scale by McConhay, Hardee and Batts, 1981). P300 is sensitive to implicit evaluation and sensitive judgments and lasts around 500ms. The work around the ERP seen with prejudice (e.g. Botvinick, Brauer, Barch, Cater and Cole, 2001) has many similarities with the broader Bodenhausen and McCrae (1998) model of cognitive control and the overlap is thought to be the area of pre-conscious conflict detection. Behavioural regulation is generally thought to require higher order attentional resources but researchers using ERP and fMRI technology have noted a brain activity at about 100ms within the dorsal lateral pre-frontal cortex (DLmPFC), an area of the brain usually associated with the executive function and have named this activity Error Related Negativity (ERN) in the form of two waveform deflections, ERN in the DLmPFC, followed by reduced activity in the Costal Anterior Cingulate Cortex, an area of the brain associated with affect and awareness in error commission. Correll, Park, Judd and Wittenbrink (2001) noted a N200 deflection which appeared to have a part in behavioural control. The neural correlates of the perception of faces from different races were investigated by Yi, Johnson, Dovidio and McCarthy (2009). White participants performed a gender identification task in which Asian, Black, and White faces were presented while event-related potentials (ERPs) were recorded. Participants also completed an implicit association test for Black (IAT-Black) and Asian (IAT-Asian) faces. Implicit association tests are sorting tasks which explore the strength of association based on the speed of response. The study revealed that ERPs evoked by Black and White faces differed, with Black faces evoking a larger positive ERP that peaked at 168 ms over the frontal scalp, and White faces evoking a larger negative ERP that peaked at 244 ms. These Black/White ERP differences significantly correlated with participants' scores on the IAT-Black. ERPs also differentiated White from Asian faces and a significant correlation was obtained between the White-Asian ERP difference waves at 500 ms and the IAT-Asian. A positive ERP at 116 ms over the occipital scalp differentiated all three races, but was not correlated with either IAT. In addition, a late positive component (at around 600 ms) was greater for the same race compared to either other race faces, suggesting potentially more extended or deeper processing of the same race faces. Taken together, the ERP/IAT correlations observed for both other races indicate the influence of a race-sensitive evaluative process that may

include early more automatic and/or implicit processes and relatively later more controlled processes.

As exciting and revealing as these fMRI and ERP studies are, practically psychologists need a way of tapping into the physiological and cognitive processes without use of fMRI or ERP technology for use in an applied setting. If we can identify our prejudices, we can as Kandola (2009) suggests act as; *"..critics, editors and managers of the stream of impressions, associations and ideas generated by our senses and our first line recognition and categorisation machinery"*. Although implicit prejudices operate in the unconscious, they can have significant real-world effects. Empirical research shows that automatic prejudice plays an important role in producing discriminatory behaviour and judgments, and that measures of implicit prejudice are significant predictors of the level of discriminatory behaviours and judgments. McConnell and Liebold (2001) and Dovidio Kawakami & Gaernter (2002) found that people high in implicit prejudice are unfriendly towards black people with whom they are asked to interact (for example, they make more prejudiced remarks after the black people have left the room). Dunton and Fazio (1997) found that people with stronger negative implicit attitudes form negative and stereotypical impressions of other groups.

### **Conscious and unconscious bias control**

Kelman (1958) had noted that people were able to exert some control through simple compliance if told not to carry out a prejudiced act such as declining a job application. Plant and Devine (2009) extended this notion by noting that conformity was often motivated by a desire not to be the subject of censure or sanction but also to avoid others seeing them as prejudiced. These 'costs' to the individual motivate them to want to manage or change their prejudices. Often this is contextually driven, and they may for example only wish to exert control in some settings (e.g. at work, at social gatherings or specifically during work decision making such as in appraisals). Plant and Devine (2009) often refer to this situational or business case for control as being 'Externally Motivated'. Plant and Devine also outline the motivation to act in an unprejudiced manner based on the 'moral case' where the subject is less concerned with the personal costs and more concerned with the egalitarian desire to be unprejudiced across situations; 'Internally Motivated'. The Plant and

Devine (2009) model can therefore be represented such that the internal and external motivation to manage or change an individual prejudice may be either Low or High.

Prejudice does not take place within a social vacuum. Indeed, prejudice requires a social context. Many of the studies of prejudice have been removed from any real social encounter where this reality can give prejudice a very different effect where the encounter is high-stakes, for example in interacting with colleagues, in selecting people for jobs or conducting performance reviews. Concerns about appearing prejudiced, especially in a organisational setting, can trigger new effects not seen in laboratory settings (Vorauer, Hunter, Main and Roy, 2000). Even the use of words like prejudice and bias can trigger this concern amongst majority groups (Vorauer et al, 2000) and lead to more avoidance behaviour (Snyder, Kleck, Stenta and Mentser, 1979). Plant (2004) suggests that those concerned with being seen as prejudiced (externally motivated) are more likely to try to avoid the person or situation. This may include complete avoidance but also micro-behaviours such as sitting further away from someone, especially when the subject matter is sensitive to the aspect of individual difference (e.g. race, disability or gender); Goff, Steele and Davies (2008). Being told to avoid being prejudiced increases reported anxiety but leads to less anxious non-verbal behaviour and reports that from the other partner in the interaction that the subject was more liked (Shelton, 2003). This suggests that under direction we can exert some control over our prejudices but that it induces an overt sense of anxiety which we are less able to control non-verbally. These deliberate attempts to control have individual differences in terms of behaviour. Those already skilled in the process find attempts to consciously control actually inhibit their regulatory performance, whereas those usually unable to control find monitoring and control enhances their control performance. Richeson and Shelton (2007) found that providing negative feedback to someone around their prejudices impeded their cognitive ability and in turn their capacity to self regulate.

The control of our prejudices is thought to be part of the executive function of self regulation. Psychologists will be familiar with the notion of the executive function controlling higher order cognitive demands (see Baddeley, 1986; Norman and Shallice, 1986) but it is now finding a place in the study of social processes. Self regulation is thought to take place within the brain's medial pre-frontal cortex and studies with brain damaged patients have confirmed this (e.g. Shallice and Burgess, 1991). A highly proficient executive function can act as a buffer against the adverse effect of our automatic biases (Payne, 2005) but the executive function is impaired by other cognitive and emotional load (Norman and Shallice,

1986). Some control is achieved through social norms. Where egalitarian values are evident overt behaviour such as handing out job applications forms or inviting people to interview may be controlled but less overt micro-behaviours such as avoidance, less eye contact and spending less time with the individual persist (King, Hebl, Shapiro, Singletary and Turner, 2006). Worryingly, Miller (2001) suggests that asserting a non bias position actually leads to an increase in the likelihood of prejudiced behaviour (known as the ironic rebound effect). Plant and Devine (2001) showed that for those with an external motivation to control, pressure to be non biased led to anger and a feeling of threat which invoked a negative reaction (the 'backlash effect'). This was supported by Lambert et al (2003) who reported that public pressure to respond without bias led to greater bias arising from an arousal which invoked the dominant group response to act against the minority group and more pronounced stereotyping. This response undermines the ability to act in a more egalitarian fashion.

### **Measuring unconscious bias**

Cognitive psychologists' attempts to understanding our neurological processes have been going on since the 19<sup>th</sup> century, notably with the groundbreaking suggestions by Dutch physician F C Donders in 1868 that the way to examine the cognitive processes was by examining the speed at which those processes took place. Donders developed elaborate items of timing equipment in his quest but it was over 100 years later that new neuro-imaging techniques helped us understand how 100 billion neurons, each with thousands of inter-dependant connections to other neurons comprising 100,000 kilometers of neural connections co-operate to perceive, represent and act on the world. With these advances in Functional Magnetic Resonance Imaging (fMRI) and Event-Related Potential (ERP) technology to explore the physical neural processes underpinning behaviour we finally have a window on those processes and this arena has taken on a whole new impetus. These more recent technological developments make it possible to 'see' the brain in action, to watch it engaging in the cognitions and emotions that are such an essential part of our mental life.

Attempts to measure our prejudices and our unconscious prejudice in particular must start with an understanding of the psychological and physiological processes which underpin the

condition. Most psychometric tests tap into conscious thinking. They require that test takers respond consciously to requests for information. However, this approach assumes that all test takers are capable of introspection and want to reveal the information requested. Measuring unconscious bias requires a different approach.

Enter, stage right, the Implicit Association Test. Implicit Association Tests (IAT) (Greenwald et al, 1998) have seen an explosion in use over the past few years as the body of evidence around their predictive capability (see a recent meta-analysis by Greenwald et al., 2009) and capacity to overcome issues around a respondent's lack of self insight or desire to distort responses has grown. The implicit association test methodology involves the accurate timing of stimuli responses in a simple sorting task as a measure of the underlying, often unconscious attitude towards a target (often a group of people). IAT methodology has been used to measure unconscious attitudes towards other groups of people, towards the self and even towards politicians and marketing brands. The most high profile and prolific use has been in the measurement of prejudiced attitudes, and in particular racial prejudice.

In recent years the applied use of IAT methodology has been hindered by lingering questions, and a fierce academic disagreement ignited with the publication of a paper in *American Psychologist* by Blanton and Jaccard (2006). In this paper Blanton and Jaccard argued that IAT metrics were essentially arbitrary: they mean very little, because of the way they are constructed. In particular, Blanton and Jaccard argued that the normative scoring of Greenwald et al's IAT meant that the scores had no real meaning, led test takers to be given feedback which had no real basis in behaviour and which made people think they were prejudiced or may be behaving in a discriminatory way. The paper triggered a number of papers from the Greenwald team, and reciprocal responses from Blanton and Jaccard. Eventually Tetlock and Mitchell (2009) outlined a suggested methodology for the two factions to follow to develop and present evidence, although to date there is no sign of this bearing fruit. Blanton and Jaccard (2006) had a number of specific criticisms of IAT:

**Meter reading; physical metrics.** Blanton and Jaccard's key criticism of IAT metrics was that they had no real world meaning. This quote is taken from their 2006 paper:

*"The arbitrary nature of many psychological metrics often is readily apparent. When told that someone has a self-esteems core of 8 on a multi-item scale that ranges from 0 to 10,*

*most psychologists would know not to draw any conclusions regarding the person's absolute level of self-esteem. Although an 8 is relatively high on the range of possible scores, this value may not indicate high self-esteem in any meaningful sense. The arbitrary nature of this metric is obvious and the fallacy of interpreting it as such is apparent. At times, however, psychological inventories are designed in ways that their surface features seem deceptively informative."*

The IAT uses time (milliseconds) as a proxy measure of the underlying construct (in this case prejudice). Blanton and Jaccard argued that although time itself is not an arbitrary measure, that the Greenwald et al (1998) IAT developers took the fact the test used time as the unit of measurement to bestow upon IAT a belief that the IAT itself was therefore not arbitrary. By treating time as the unit of measurement test developers were also able to apply log transformations and other algorithms to the data including the development of a number of algorithms which used the standard deviation of a respondents' scores to account for the base-line response speed of the respondent. In doing this Blanton and Jaccard argued that these transformations were based on the notion of getting a better measure of the unit of measurement in time, and had nothing to do with getting a better measure of the underlying attitude. Blanton and Jaccard felt researchers were actually getting further and further from that goal by applying transformations of this sort.

**Unit measurement.** Blanton and Jaccard suggested that the Greenwald et al team were unable to say what a unit movement in IAT scores meant in terms of the unit of the underlying construct (in this case group preference and behaviour). As well as being a technical objection, this is an important question for test users in applied settings. When such tests are used to measure change (for example in the evaluation of an anti-prejudice programme or in a personal coaching setting) it is necessary to know what a point score reduction on the test means in terms of the behaviour that is being acted upon. How much change is enough to indicate that we have impacted on real world behaviour?

**Score interpretation.** Blanton and Jaccard (2006) used by way of an example the Greenwald et al (1998) race preference IAT which used White and Black ethnic groups. This test had been available online for unproctored completion for a number of years and had a very large database of scores. Preference for one group over the other was determined by computing the mean latency between the condition where test takers are asked to assign an ethnic group with 'good' constructs against the mean latency when asked to make the

opposite assignment with 'bad' words. These latencies then have a log transformation applied to manage the baseline response speed of the respondent, called *d scoring*, to arrive at a final test score. Visitors to the Greenwald et al web sites were provided with feedback about the magnitude of any preferences they possessed as either a "slight," a "moderate" or a "strong" preference. Overall, 73% of respondents were given feedback indicating that they have at least some degree of preference for White people and 43% being told that they have a "*strong automatic preference for White people.*" Blanton and Jaccard pointed out that these results have been interpreted by some in the research community, in psychology textbooks, and in the popular media as evidence that the majority of people in our society possess a degree of unconscious prejudice against people who are Black. This is not the case, as the Greenwald IAT is simply norm scored and is a comparative measure. Online blogs suggest that the lay person further interprets this to mean that that they are 'racist'.

The challenge for this study was to harness the methodology of the IAT to access our unconscious processes, whilst dealing with the criticisms of Blanton and Jaccard (2006).

## **Methodology**

In response to the Blanton and Jaccard's (2006) concerns a new IAT metric was developed based on a criterion, rather than a normative scoring algorithm; *Implicitly*. The 'Implicitly' scoring and labeling algorithm was concerned only with predicting the criterion, which was based on a self-report measure developed from the work of Allport but also from the web sites of far right wing groups in the UK such as the BNP, BPP and Stormfront. These included beliefs about own group superiority in terms of intelligence, trustworthiness, cleanliness and competence, and having acted negatively towards the target group by telling derogatory jokes, criticising them as a group, avoiding them and abusing them. Use of an explicit measure of self report as a criterion measure will often under represent the predictive power of an implicit measure because of a lack of self insight or willingness to disclose on the part of the respondent. Even so, in two studies with 1065 people a correlation of .45\*\* ( Jones 2008a) was seen between the explicit self reports and the new implicit measure. By anchoring the metric to the behaviour this enabled test scores, score labels, unit-unit correspondence and a zero point to be established. Although based on the same Greenwald et al (1998) concept of using response time measures the new metric differed significantly from the Greenwald IAT, not only in using criterion scoring but also in

structure. It used a five stage rather than a seven stage process, used no log transformations of scores and used the specific categorisation words evident in the literature and right wing web sites rather than less evaluative 'good' and 'bad' words used by Greenwald and his Harvard University based team. It also used a series of pre-test practices to reduce any practice effects which led to an improvement in test-retest reliability to .83. The scoring algorithm included a balancing for the cognitive inertia of test direction (which groups are first paired with 'good' words). The development of Implicitly is well documented in Jones; 2008, 2008a, 2009, 2009a, 2009b, 2010, and 2010a.

Using the revised test development methodology a range of the new criterion referenced IATs were developed looking at; Age, Disability, Ethnicity (x3), Gender (x3) and Sexual Orientation (x2). The tests were based on the diversity 'fault lines' (Lau and Murnighan, 1998; Kandola, 2009; Hannum et al, 2010). In addition to these validated tests a large number of 'beta' tests were developed ready for use including versions looking at bias towards specific ethnic groups (Black Males, Asian Females,) religions and nationalities. Country specific tests were also developed (e.g. Black Males and Females in South Africa) and are available for use in low risk settings awaiting validation.

The tests report on a scale between -100 and +100 depending upon the direction of the unconscious bias but assign a label at the point where the strength of the implicit association becomes strong enough to impact behaviour (as indicated by the criterion measure). The scaling aligns with the criterion measure such that one point on the scale equates to around one point on the criterion measure, and each test has a zero point at which the behavioural impact is believed to be close to none (which is typically not at zero on the test scale). The test identifies the levels of risk of an individual's unconscious bias becoming behaviour. During development, issues around faking, test order, repeated exposure and the factor structure of multiple biases were addressed (Jones; 2008, 2008a, 2009, 2009a, 2009b, 2009c, 2010, and 2010a.)

With Implicitly, employees may be able to gain self insight to their own biases, and gain a better understanding of the motivations and behaviour of others, making them more diversity literate. This supports the wider aim to have culturally intelligent staff in a workplace and business environment which is getting increasingly diverse.

## Implicit intervention

Now that we have a method of measuring our personal biases, it affords the opportunity to intervene, and to target interventions to enable individuals to reduce or manage their biases, and to know how successful those interventions have been. Traditionally in organisations intervention has involved some sort of training. Diversity training in organisations can be seen as being divided into three broad categories (Kandola, 2009); *Awareness raising/managing risk Interventions, Behavioural Interventions* and *Attitudinal Interventions*. *Awareness raising* seeks to impart information on legislation, policy, the nature of prejudice and of particular groups. It seeks to protect the organisation in the event of complaint by passing some of the responsibility for actions to avoid discrimination to the employee. An evaluation of one well designed programme by independent consultants outlined by Kandola (2009) indicates that the knowledge obtained in such programmes may not be well retained by participants. Kandola reported that after 3 months knowledge levels had fallen back to pre-training levels. *Behavioural training* looks to develop skills sets including the demonstration of certain values by training for employees (usually managers) in dealing with diversity issues. Kandola (2009) suggests that such interventions can enhance confidence in dealing with situations involving diversity. Over a third of manager trainees reported own behaviour change as a result of behavioural training although this confidence in personal development was not shared by those staff reporting to the manager. It is the third area; *Attitudinal training* to address issues around biases and prejudices where psychologists should have the most to say, yet attitude change is very rarely directly sought in traditional organisational interventions. A review by Paluck and Green (2009) of 985 prejudice reduction interventions revealed a startling lack of rigor in the way in which prejudice intervention and prejudice reduction programmes and initiatives were carried out and evaluated. Amongst the 985 studies published in the five years to Spring 2008, 72% were published studies. Nearly two-thirds of all studies (60%) were non-experimental, of which only 227 (38%) used a control group. The preponderance of non-experimental studies was smaller when they look at published work; nevertheless, 55% of published studies of prejudice reduction use non-experimental designs. Paluck and Green concluded that;

*"The causal effects of many widespread prejudice-reduction interventions, such as workplace diversity training and media campaigns, remain unknown. Although some inter-*

*group contact and cooperation interventions appear promising, a much more rigorous and broad-ranging empirical assessment of prejudice reduction strategies is needed to determine what works. Entire genres of prejudice-reduction interventions, including diversity training, educational programs, and sensitivity training in health and law enforcement professions, have never been evaluated with experimental methods."*

Despite decades of development in diversity training the outcome of an observation study of training content by Pendry, Driscoll and Field (2008), and the views of Kandola (2009) are that often diversity interventions use poorly thought through, often emotionally confrontational methods. As Kandola notes, some diversity trainers judge success by the number of people they have made to cry during the day's training. Paluck and Green (2009) indicated that often interventions are not driven by the psychological theory, the evaluation methodologies are very frequently flawed and importantly, they often assume that self-report measures such as interviews and questionnaires are valid measures of the construct under examination.

With Implicitly the previous inertia and methodological problems reported by Paluck and Green are beginning to shift and new models of prejudice intervention are emerging ( see for example Tarr, 2007, Crisp & Turner , 2009, Olson and Fazio, 2006). The shift is from a conscious norm based awareness and sanction training model towards one involving psychological models underpinned by the new neurological methods and neuroplasticity. These models recognise the processes of unconscious bias and provide unconscious interventions which seek to 'rewire' the cognitive processes by rehearsing new automatic processing routines in recognising faces, de-activating or creating new more positive associations and re-categorising target groups. In addition, a body of method and knowledge is developing which enables organisations to tailor and to target interventions around the specific unconscious biases of an individual or organisation, and the individual differences in the motivation to change or manage prejudiced attitudes ( Plant and Devine, 2009; Stenner, 2005; Fishbein and Ajzen, 2010). These research led interventions give a promise of utility in organisations as an alternative to traditional diversity training.

## **Practicalities and discussion**

**Implementation of IAT methods.** At first glance implicit measurements through Implicitly are attractive; a reliable method of identifying and measuring our personal and organisational biases for intervention largely free of the effects of social desirability, self awareness or impression management. The potential for use in staff selection, staff development, organisational audit, research and in intervention evaluation is enormous. Implementation has proved to be a more complex affair. The very sensitive nature of the subject matter and the raft of organisational policies and practices which adopt a conscious and pejorative response to personal bias acts as barriers. Leaders, managers researchers and psychologists themselves often come from a background where personal agency is prominent. They tend to be reticent and cautious about processes and methods which suggest we do not have an internal locus of control.

### **Legal issues of IAT methods**

The most evident legal issue is around data protection: who owns and has access to test data? Protocols for other test data can apply but the experience has been that users of Implicitly have been very sensitive around data retention and have wanted data to be retained for very short periods (less than a month but sometimes less than a week). Retaining test results on employee or applicants' personal files or organisational databases for any longer period has been resisted, even if they have a continuing use within the HR function. Lawyers in the US (see Bielby, 2005 for example) have outlined the barriers and potential for IAT to be used in legal settings to help settle discrimination cases, but we are some way from adopting that approach in Europe.

### **Ethical issues of IAT methods**

The fact that the IAT methodology is less susceptible to faking or distortion than many explicit measures has led some to question whether the right to privacy of an individual is violated by the use. The response has been to ensure that test takers are absolutely clear about the purpose of testing, and how the data will be used, so that an informed consent is obtained. This does not differ from other psychometric tests where best practice is outlined by the British Psychological Society. Just like personality questionnaires, employees and job applicants have the right to decline to be tested. The Implicitly test system insists that test users outline to test takers the purpose of testing, how the data will be used, and the

arrangements for feedback. Feedback is designed to be as non-pejorative as possible and to give advice on effecting change.

## **Conclusions**

The equality, diversity and inclusion (EDI) industry is at a watershed. Increasingly difficult fiscal conditions within both the public and private sectors are directing scrutiny at relatively expensive and traditional diversity interventions such as training and coaching. The time is right to challenge the conventional notion that anti-discrimination norms, backed by legal sanctions, can prevent or reduce unconscious prejudice. This is supported by research around existing interventions which Paluck and Green (2009), Pendry et al (2008) and Kandola (2009) suggest show little evidence of real world success. The evidence from emerging neurological methods such as fMRI and ERP, and developments in psychometrics afford a unique opportunity to move forward the EDI industry at a time when the returns from traditional research, legislation, law, policy and intervention seem to have diminished. The industry has to offer organisations something new, something with a much stronger research base than what has gone before and something which shows promise in making strides towards the goal of managing and reducing bias in the organisation.

Many of the technical barriers for use of the IATs have been addressed. In the context of staff development, organisational audit and the evaluation of interventions, IAT and intervention methods which recognise and harness the neurology of unconscious bias offer an exciting opportunity. It is the responsibility of psychologists, researchers, leaders and managers to take that opportunity. Any reticence to embrace implicit methods may be because implicit methods often run counter to our personally held beliefs that we are very much in control of our behaviour and our destiny. This paper presents evidence, whether we like it or not, that our unconscious processes still have a very strong influence over our behaviour towards others at work and that by acknowledging this we may open the door to more effective bias reduction and management processes.

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