

# CURRENT RESEARCH IN SOCIAL PSYCHOLOGY

---

Volume 8, Number 17  
Submitted: April 4, 2003  
First Revision: May 7, 2003  
Accepted: May 9, 2003  
Publication Date: May 9, 2003

## ANXIETY-INDUCED RESPONSE PERSEVERANCE AND STEREOTYPING CHANGE

Natalie R. Hall  
University of Birmingham

Richard J. Crisp  
University of Birmingham

### ABSTRACT

*This study examined anxiety as a potential moderator of stereotype change. Previous work has independently demonstrated an increase in stereotyping under conditions of high anxiety as well as following attempts to suppress stereotypic thought. The combination of these two antecedent conditions might thus be expected to produce an additive increase in stereotyping. In contrast to an additive pattern, however, we observed an interaction between anxiety and suppression task instruction. Whilst both the instruction to suppress (in the absence of anxiety) or anxiety (in the absence of the instruction to suppress) did independently increase stereotyping, when the two co-occurred, there was no change. We explain this interaction by considering work from neuropsychological domain on response perseverance: cognitive overload (one consequence of anxiety) may inhibit the ability to switch between modes of perception. These findings suggest a potentially important moderator for attempts to suppress social stereotypes, and point to the efficacy of integrating work from diverse domains for understanding the operation of executive processes in person perception.*

[242]

-----  
[243]

### INTRODUCTION

The suppression of stereotypical thoughts is a key element of self-regulation in societies with egalitarian norms. Successful suppression in the short run, however, can come at a cost. Following a period of conscious suppression, a "rebound" effect is commonly observed, whereby perceivers implicitly and explicitly demonstrate attitudes and behaviors consistent with heightened stereotype activation (Macrae, Bodenhausen, Milne, & Jetten, 1994). It is also apparent, however, that several conditions moderate the extent of this rebound effect (such as

self-salience, Macrae, Bodenhausen, & Milne, 1998; the normative sensitivity of the target groups, Wyer, Sherman, & Stroessner, 2000; compunction, Devine, Monteith, Zuwerink, & Elliot, 1991; and self-regulatory motivations to be non-prejudiced, Monteith, 1993). In this research we investigated a novel potential moderator of the rebound effect: induced anxiety.

### **Post-suppressional rebound**

The effects of thought suppression, whilst successful in the short run, have been found to be somewhat paradoxical (Wegner 1994; Wegner & Erber, 1992). Typically, perceivers instructed to engage in suppression are able to do so under normal processing conditions, but appear to experience hyperaccessibility of the suppressed thoughts under conditions of cognitive busyness (Wegner, Schneider, Carter, & White, 1987). Work into stereotype suppression has found similar effects on social category-related thoughts. In particular, a post-suppressional "rebound" effect is typically observed where the suppressed stereotypic thought inadvertently enters consciousness after the initial period of suppression has ended (Macrae et al., 1994; Macrae et al., 1998; Macrae, Bodenhausen, Milne, & Wheeler, 1996; Wyer, Sherman, & Stroessner, 1998, 2000; Forster & Liberman, 2001; Yzerbyt, Corneille, Dumont, & Hahn, 2001; see also Monteith, Sherman, & Devine, 1998, for a review). In Macrae et al.'s (1994) first study, the effects of suppressing stereotypic thoughts about a social category (skinheads) were examined. Participants wrote a more stereotypical account of a day in the life of a second skinhead target if they had been instructed to suppress stereotypic thoughts when writing about a skinhead target at an earlier phase. In two other experiments, a behavioral measure of social distancing and a response time measure of stereotype activation showed a corresponding rebound effect. This phenomenon has been explained in terms of a dual process model of suppression (Wegner & Erber, 1992). An automatic process monitors consciousness for the unwanted thought whilst a controlled component replaces the identified unwanted thought with distracters (Wegner et al., 1987). Rebound can thus be explained by a priming effect, such that following the cessation of controlled, intentional suppression, the automatic process of searching for stereotype-related thoughts, having primed the implicit representation of the suppressed stereotype, makes subsequent activation more likely.

Recent work has examined moderators of the rebound effect. Stereotyping against certain groups is not subject to any strong personal or social norms (e.g., Macrae et al.'s skinhead category), whilst other groups may be defined as "socially sensitive." Wyer et al. (1998) demonstrated that *spontaneous* suppression of racial stereotypes occurred when egalitarian non-prejudiced norms were made salient (a similar effect occurs when self-focus is increased, which in turn increases personal standards of egalitarianism; Macrae et al., 1998 [1]). This can be explained by the notion that whilst there are apparently no social sanctions against stereotyping a group such as "skinheads," openly stereotyping an African American may result in severe social sanctions. On this basis, Wyer et al. (2000) predicted that that for a socially sensitive racial stereotype a rebound effect may not occur [2]. This was indeed what was found: the absence of a rebound effect in line with the above notion of social sensitivity. Whilst for a race-unspecified target rebound occurred, for a race *specified* target (where activation of the racial stereotype was expected to be overridden by conscious application of egalitarian personal standards) there was no rebound effect. In a second experiment, Wyer et al. (2000) demonstrated that the absence of rebound was indeed attributable to spontaneous (controlled) suppression resulting from the

recognition of social sensitivity. When the race of the target was specified and the participants were cognitively busy, the rebound effect re-emerged. In essence, the extent to which social norms define the acceptability of stereotyping a particular group moderates rebound.

Considering the work above it is apparent that rebound effects for socially sensitive targets have been examined with and without cognitive load (Wyer et al., 1998; Wyer et al., 2000), and the suppression of non-socially sensitive stereotypes has been considered without load (Macrae et al., 1994). One of our aims was therefore to examine rebound when combining load with suppression of a non-sensitive stereotype. We also sought, however, to utilise an alternative (and ecologically interesting) method of manipulating cognitive resources.

[243]

[244]

## **Anxiety**

In information processing, anxiety narrows the focus of attention (Easterbrook, 1959; Kahneman, 1973) and this can lead to an inattention to peripheral details (Heuer & Reisburg, 1990). Ingram and Kendall, (1987) report that a characteristic of anxiety is that it reduces processing capacity (Mueller & Thompson, 1984), possibly because the arousal activates the autonomic nervous system and internal cues compete with task demands for processing capacity (Mandler, 1975). Stephan and Stephan (1985) suggest that high levels of anxiety will cause biases in information processing with much social information being processed minimally, therefore implying the use of cognitive shortcuts such as stereotypes. This is further supported by anxiety often causing increased reliance on automatic processing (Ingram & Kendall, 1987). High anxiety therefore seems to have the consequence of restricting cognitive resources, or, in other words, increasing cognitive load. Furthermore, high anxiety appears to increase the reliance on stereotyping as a means of guiding category-relevant processing (Wilder & Shapiro, 1989). In summary, high anxiety restricts executive processing capacity in person perception in apparently the same way as more direct manipulations of load (e.g., digit span rehearsal; Gilbert & Hixon, 1991; or random number generation; Macrae, Bodenhausen, Schloerscheidt, & Milne, 1999). Correspondingly the increased reliance on heuristic processing means stereotypes will have a greater influence on social judgement. Thus, not only does anxiety act as a means of limiting cognitive capacity, in so doing it can increase stereotyping (in line with the effortful nature of suppression; Gilbert & Hixon, 1991; Macrae, Bodenhausen, & Milne, 1995; Wyer et al., 2000).

## **Suppression and anxiety**

Based on the work outlined above, it seems that clear predictions can be made regarding the effects of suppression and anxiety on the rebound effect. When the targets are non-sensitive, suppression should increase stereotyping. High anxiety should also independently increase stereotyping. Together, then, we might expect an additive effect on stereotype change from an initial phase involving suppression/no suppression to a later phase following anxiety induction. With no suppression and low anxiety there should be the least increase in stereotyping from an initial judgement phase to a latter judgement phase (we may expect some baseline increase due to a priming effect of stereotype activation at phase 1). In comparison, with suppression and low

anxiety, or no suppression and high anxiety, a greater increase stereotyping would be expected (due to the rebound effect *or* the resource depleting effects of high anxiety). Suppression *and* high anxiety would be expected to show the largest increase stereotyping, due to the combined effects of rebound and high anxiety.

## **METHOD**

### **Participants and design**

Fifty-four non-psychology undergraduate participants (aged 17 to 19; 32 males, 22 females with equal proportions across conditions) were randomly allocated to a 2 (condition: control vs. experimental) x 2 (anxiety: low vs. high) between-subjects design. The target person featured at phases 1 and 2 was a Chinese female. We expected our participants to have no strong norms against using category-based expectancies in impression formation for this group since the Chinese stereotype appears to be predominantly positive in this context [3] (negativity seems an inherent pre-requisite for normative social sensitivity).

### **Procedure**

#### *Suppression instruction*

Participants were informed that the study was concerned with "graduate recruitment processes." All participants were given one of two photographs of a Chinese individual. They were asked to write about a day in the life of this person (cf. Macrae et al, 1994). Half of the participants were told nothing further, the other half were told that "other research has shown that people can be biased by thinking about the target in a stereotypic manner" and that they "should avoid using any language that may be construed as stereotypic." All participants were allowed five minutes to complete the task.

[244]

-----  
[245]

#### *Anxiety manipulation*

After the suppression task, and before measuring phase 2 stereotyping, participants were told that the graduate recruitment experiment was completed and that they would now complete some ostensibly unrelated tasks which were being carried out for a colleague of the experimenter. This made it clear to the participants that the task involving suppression had finished and they were moving on to a new task which was unrelated to the previous instructions. Participants were told that they would read a short passage about a person after which they would be required to answer some questions and make some judgements. In the low anxiety condition these were the only instructions participants were given. In the high anxiety condition participants were also told that at some point in the following impression formation task they would be asked to give a presentation on a surprise topic. Furthermore, they were expected to talk spontaneously and continuously for five minutes on this issue. To strengthen the manipulation of anxiety, participants were also told that this speech would be used to assess their presentation skills and

as such would be recorded on video camera. To increase the believability of the cover story a camera was then brought into the room and set up.

Participants were then presented with a passage about a Chinese female where ethnicity was implied by the name of the target person ("Wei Ling.") The passage consisted of six behaviours, two were stereotypic (achieving a high mark in a test, sitting down to a family meal), two counter-stereotypic (going to a night-club, working in a supermarket) and two neutral behaviours (watching TV, socialising in a wine bar), all acquired from pre-testing [4]. After completing a measure of stereotyping, participants were then thanked, debriefed and dismissed.

## **Dependent measures**

Phase 1 descriptions written by participants were rated by two independent judges as to whether a number of pre-tested stereotypic personality attributes were applicable to the described person (not at all, —5; very, +5). The personality attributes were four stereotypic traits (*intelligent, family orientated, disciplined, and traditional*), four counter-stereotypic traits (*inconsiderate, offensive, lazy, and careless*), and four stereotypically neutral filler traits (*approachable, stern, defensive, and unsympathetic*) determined from pre-testing ( $N = 28$ )[5]. At phase 2, participants were asked to rate the person presented by the behavioral descriptions on the same scale as used by judges to rate the passage produced in phase 1 (i.e., to what extent is each trait applicable to the target person; not at all,—5; very, +5). This allowed a direct comparison between phase 1 and phase 2 judgements. At phase 1 only, there was an additional single item requiring the coders to provide a score for overall stereotypicality of the passage written by participants. This served as a manipulation check on the effectiveness of the suppression instructions (not at all, —5; very, +5).

Directly following the anxiety manipulation we measured participants' anxiety levels (adapted from the scale used by Wilder & Shapiro, 1989). This served as a manipulation check that those in the high anxiety condition had been made more anxious than those in the low anxiety condition. The scale consisted of four measures, "dull" to "jittery," "unaroused" to "aroused," "relaxed" to "stimulated", and "calm" to "excited". The scale was anchored from —3 with the non-anxious descriptor (e.g., "relaxed") to +3 with the anxious descriptor (e.g., "stimulated"). The "dull" to "jittery" scale was reverse-coded.

## **RESULTS**

### **Scale construction**

For ratings of the stereotypicality of the descriptions completed by participants at phase 1, Cronbach's alpha's for the four stereotypic traits were .659 and .581 for the two judges respectively. The four stereotypic traits were thus averaged to produce a single measure of stereotyping for each judge. There was a significant correlation between the two judges responses,  $r(54) = .718, p < .0005$ , so the indices were averaged to form a single measure of stereotypic ratings at phase 1. Cronbach's alpha's for the four counter-stereotypic traits were .821 and .811 for the two judges respectively. Thus the counter-stereotypic traits were also averaged. There was a significant correlation also between counter-stereotypic ratings,  $r(54) =$

.648,  $p < .0005$ , so a single index of counter-stereotypic attribute endorsement was created by averaging the two coders judgements as with the stereotypic traits. Finally, the index of counter-stereotypic ratings was subtracted from the index of stereotypic ratings to produce an overall stereotyping index for phase 1. This index indicated the extent to which stereotypic items were endorsed more than counter-stereotypic items (with the test valued of zero: indicating no difference in ratings of stereotypic versus counter-stereotypic; i.e., no stereotyping). The measure of stereotypicality for the second phase of the experiment was obtained from the participants' ratings of the Chinese female described by the behavioral sentences. After reading the passage, the target individual was rated on the same traits as the judges used in phase 1 (which allowed a direct measure of the change in stereotyping from phase 1 to phase 2 to be calculated). The same indices were created as in phase 1, except here instead of two judges ratings, there was only one measure of stereotypic versus counter-stereotypic trait endorsement provided by the participant: stereotypic alpha = .686; counter-stereotypic alpha = .659. As for phase 1, a stereotyping index for phase 2 was created by subtracting counter-stereotypic from stereotypic ratings. Finally, an index of stereotype change was created by subtracting the phase 1 stereotyping index from the phase 2 stereotyping index. This produced an index of the extent to which stereotyping increased (positive values), remained constant (zero) or decreased (negative values) following the experimental manipulations.

[245]

[246]

## **Preliminary analyses**

### *Social sensitivity*

We examined ratings on the stereotyping index (stereotypic minus counter-stereotypic ratings) at phase 1 to assess whether overall stereotyping had occurred. A one-sample t-test revealed mean stereotyping greater than the zero (i.e., endorsement of more stereotypic than counter-stereotypic attributes) under baseline conditions (no suppression),  $M = 2.23$ ,  $t(25) = 4.71$ ,  $p < .0005$ . Therefore, as expected, participants did not seem to regard it as normatively inappropriate, under control conditions, to use stereotypic expectancies to guide their judgements of the Chinese target person.

### *Anxiety*

The items formed a reliable scale (Cronbach's alpha = .738) so were averaged to form an overall index of anxiety. A t-test comparing anxiety scores for the low versus high anxiety manipulation revealed higher levels of anxiety in the high anxiety condition ( $M = .389$ ) compared with the low ( $M = -.426$ ),  $t(52) = -3.45$ ,  $p < .005$ . Participants in the high anxiety condition thus rated themselves as more anxious on the anxiety scale than those in the low anxiety condition.

### *Phase 1 stereotyping*

The single item assessing overall stereotypicality at phase 1 was highly correlated for the two coders,  $r(54) = .651$ ,  $p < .0005$ . The collapsed index, however, revealed no differences in

stereotyping as a function of condition. Although this measure of phase 1 stereotyping did not attain significance (making it difficult to conclude that suppression had, in fact occurred), we went on to include the condition factor in the main analysis below. This is because participants had nonetheless been exposed to different experimental conditions: Whilst this might not have affected suppression, it was still important to examine whether either the predicted effect would occur as a function of suppression instruction (suggesting that the measure of phase 1 stereotyping was a weak indicator of the effects of suppression), or, indeed, given no suppression had occurred we obtained a pattern of findings in line with this absence of suppression (i.e., no effect of task instruction on subsequent stereotyping).

### **Stereotype change**

A 2 (condition: control vs. experimental) x 2 (anxiety: low vs. high) between-subjects Analysis of Variance (ANOVA) revealed only a condition x anxiety interaction,  $F(1, 50) = 6.08, p < .05$ . There was no main effect of condition ( $F = .126$ ) nor anxiety ( $F = 1.47$ ). Despite the apparent ineffectiveness of the suppression manipulation on phase 1 stereotyping, subsequently the instruction to suppress did have an effect on stereotyping at phase 2. Instead of the predicted additive pattern, however, we obtained an interaction between condition and anxiety. Simple effects analysis revealed an interesting pattern of stereotype change following the varied combinations of condition and anxiety. Under conditions of low anxiety we might expect the standard increase in stereotyping (if the task instructions had had the intended effect). Indeed, stereotyping did increase following the instruction to suppress ( $M = 3.51$ ) compared to control ( $M = 2.00$ ), and although this difference only approached significance,  $F(1, 50) = 2.24, p < .15$  (which is understandable, given the weak effects of the initial suppression exercise). With relatively higher anxiety, however, there was the opposite effect. Following the instruction to suppress there was less of an increase in stereotyping ( $M = .879$ ) compared to control ( $M = 2.90$ );  $F(3, 50) = 3.96, p < .06$ . Focusing on anxiety differences, there was a trend in the predicted direction, high anxiety increase stereotyping ( $M = 2.90$ ) relative to low anxiety ( $M = 2.00$ ) under control conditions, although not significantly so,  $F(1, 50) = .757, p > .30$ . In the experimental condition, however, there was a reversal of the typical effect of anxiety on stereotyping,  $F(1, 50) = 7.03, p < .02$ : Following the instruction to suppress, despite the absence of demonstrable suppression at phase 1, low anxiety led to greater stereotyping ( $M = 3.51$ ) compared to when participants experienced a high level of anxiety ( $M = .879$ ). Clearly then, our experimental manipulation did have an (unexpected) effect on stereotype change. We discuss the possible explanation and implications of this finding below, in the context of two important caveats: The absence of demonstrable suppression in stereotyping at phase 1 and the relatively low magnitude of the effects.

[246]

[247]

**Table 1: Mean stereotype change and rated anxiety as a function of condition and anxiety manipulation**

Condition

	Control		Experimental	
	Low anxiety	High anxiety	Low anxiety	High anxiety
	N = 14	N = 12	N = 13	N = 15
Anxiety	-.429	.688	-.423	.151
	(.600)	(.833)	(1.04)	(.925)
Stereotype change	2.00	2.90	3.51	.879
	(2.43)	(1.97)	(3.00)	(2.87)

*Note:* Standard deviations are shown in parentheses.

## DISCUSSION

In this experiment we intended to test anxiety as a novel moderator of post-suppressional stereotype change. Based on work that has shown a clear resource-depleting effect of anxiety on information processing, and a corresponding increase in the reliance on heuristic processing, we predicted that anxiety would function in a similar manner to cognitive busyness in this context. We expected an additive effect on stereotype change such that both high anxiety and suppression would increase stereotyping more than either independently. Our findings, however, tell a rather different story, and one which we believe may suggest some interesting new processes at work with respect to stereotyping phenomena. Before we discuss this further, however, there are two cautionary caveats to these findings that we should note.

First, the experimental manipulation did not appear to produce suppression in participants' impression formation. On one level it could be argued that our measure was simply not sensitive enough to fully tap the effects of suppression (it was a single item of overall stereotyping, compared to the main anxiety and stereotyping measures that were constructed from multi-item scale). Thus, whilst we cannot be sure that participants were not suppressing stereotypical thoughts as a result of the manipulation, we can equally not be sure that they were. Future work on this issue should certainly attempt to find a more robust measure of suppression, but in terms of interpreting the effects of anxiety and our experimental manipulation on stereotyping here, we will not assume that participants suppressed stereotypical thoughts at phase 1. Rather, all we can conclude is that the *instruction* to suppress had demonstrable effects on stereotype change, perhaps without actually causing suppression at phase 1. Whilst this precludes us from making any strong statements with respect to internal psychological processes at phase 1, it does not negate the fact that the instruction given to suppress did have an effect on participants' perception of the target in conjunction with anxiety at a later phase, and it is this interaction that we believe may provide some useful and potentially fruitful avenues for future work.

Second, whilst participants did not demonstrate any suppression at phase 1, the instruction to suppress did affect the subsequent influence of anxiety on stereotyping. Whilst independently

high anxiety and the instruction to suppress significantly increased stereotyping, when they co-occurred there was no increase in stereotyping. The magnitude of the effects for both stereotyping and anxiety were, however, a little low (possibly due to error introduced into the indices by using aggregates of independent coder's assessment of participant's use of stereotypes, or perhaps simply due to relatively low power), but we believe we have uncovered an important effect that may warrant further investigation. The unexpected interaction effect could not have been predicted from previous work, but it may be indicative of an interesting processing implication with specific relevance to research on stereotype change. Specifically, we suggest the interaction may be a unique consequence of the timing of the anxiety manipulation, and furthermore, that this may reflect a highly realistic person judgement situation. We elaborate on this in the context of previous work in the anxiety and suppression domains below.

[247]

[248]

The key finding of interest here is the condition in which participants have been given an instruction to suppress at phase 1 and who are also experiencing, in relative terms, high levels of anxiety (compared to our low anxiety participants). Here, instead of an additive effect of task instruction and anxiety (which would be predicted from work in either domain), there appeared to be a smaller increase in stereotyping compared to both control/high anxiety and experimental/low anxiety conditions. We suggest the cause of this interaction may lie with the onset of the anxiety manipulation. Anxiety was induced following phase 1, and just prior to the judgement task in phase 2. This was at the same time as participants were informed that the second task was unrelated to the first (and so, by implication, the instruction to suppress was no longer applicable). If induced anxiety narrows attentional resources, it may, however, also prevent adequate processing of the task requirements. In other words, participants may not be able to implement the instruction that suppression is no longer required at phase 2 relative to phase 1. The consequence of this would be no increase in stereotyping at phase 2. Of course, our manipulation check revealed that participants were not demonstrably suppressing at phase 1. We argue, however, that this does not mean that the instruction to suppress (task instructions) had necessarily no effect on their (subsequent) judgements. Apart from the possibility that our manipulation check simply did not adequately tap the participant's mental attempts at suppression, it remains possible that across the full *time course* of the experiment that the instructions had a particular effect for participant's subject to relatively high anxiety. Participants who had been told to suppress at phase 1 showed no increase in stereotyping (under high anxiety) compared to similarly instructed participants experiencing less anxiety who stereotyped *more*. Across the two phases of the experiment, participants in the experimental condition who experienced higher levels of anxiety did show significant suppression *at phase 2* compared to participants in the experimental condition who experienced lower levels of anxiety than at phase 1. Higher levels of anxiety led to consistent suppression of stereotyping (no stereotype change) *relative* to participants with lower levels of anxiety who appeared to show increased stereotype use when task instructions changed. The task instructions appeared not to have an effect at phase 1, but rather, a more protracted effect across both phases of the experiment as a function of anxiety. It appears that high anxiety in some way led to a perseverance of low stereotyping, which did not occur for low anxiety participants. Is there any previous work that might support the notion that anxiety may cause "behavioral perseverance" in this way?

Interestingly, consideration of work in the apparently disparate neuropsychological domain may offer some support for the notion that behavioral perseverance is involved in the observed interaction. If anxiety acts in a similar way to direct manipulations of cognitive load (Mueller & Thompson, 1984; Stephan & Stephan, 1985; Wilder & Shapiro, 1989), and restricts executive functioning (Macrae et al., 1999), then it may have some effects similar to executive deficits observed in the cognitive neuropsychological literature. Executive function consists of executing, controlling, changing and monitoring all mental activities (Pineda, 2000), and has been broadly located in the frontal lobe region of the brain (Norman & Shallice, 1986; Shallice, 1988; see also Stuss & Alexander, 2000, who found that affective responsiveness has a significant role of the frontal lobes). Furthermore, frontal lobe damage can lead to a phenomenon called "behavioral perseverance" (Humphreys & Forde, 1998). Behavior perseverance is the repetition of an action or behaviour, potentially because the action cannot be switched off, or inhibited (Knight & Grabowecy, 1995). So, frontal damage can cause deficits in executive functioning which include behavioral perseverance. Executive functioning is disrupted by cognitive busyness, which can influence social perception (Macrae et al., 1999). It is not (too much) of a leap to suggest that induced cognitive load (in this case via high anxiety) may have effects analogous to damage to the area responsible for normal executive functioning. It is therefore possible that the decrease in executive capacity following induced anxiety (i.e., cognitive load) may thus promote some level of behavior perseverance in non-brain-damaged perceivers. In the context of suppression, this may mean that following an initial suppression phase, but prior to a second social judgement phase where suppression is normally relaxed, executive deficits caused by induced anxiety may lead to an inability to "switch off" suppression. On this basis, high anxiety and suppression combined should lead to a continuation of suppression at a second judgement phase, when normally it would have abated (leading to a rebound effect), and as such lead to no increase in stereotyping. In essence, the narrowing of attentional focus (Easterbrook, 1959; Kahneman, 1973; Stephan & Stephan, 1985) created by high anxiety may prevent the implementation of the instruction that the phases are unrelated. In the absence of anxiety, participants are thus able to change their mode of perception, whilst under anxiety-provoking conditions, they are unable to switch from regulating their stereotypic responses.

Again, we acknowledge that the effects obtained were of low magnitude, but if indeed there are additional processes at work in this context, such as response perseverance, then we suspect that with further investigations that are specifically designed to assess such processes, that a more robust effect along the lines suggested by the current research may be observed. This explanation for the effect we observed is admittedly post-hoc, but it is also entirely consistent with the absence of an increase in stereotyping in the experimental/high anxiety condition.

[248]

[249]

These findings may point to important considerations with respect to the time course of events in many real instances of stereotype suppression. Spending time adhering to egalitarian norms of suppression, and then being about to encounter one of those stereotyped groups (which may induce anxiety) may lead to perseverance of suppression when actually meeting the member of that group, rather than a rebound effect. Of course, if anxiety (and load) was induced during (rather than before) the second "phase," when suppression had already ceased, then no perseverance would be expected. In this case the additive effect of heightened stereotyping may

occur consistent with a combined post-suppressional rebound and reliance on heuristic (stereotype) processing due to anxiety. When anxiety precedes a judgement task post-suppression, however, perseverance of suppression may occur.

## **Conclusions**

In contrast to an additive effect predicted on the basis of independent suppression and anxiety work, on a measure of stereotype change, we observed an interaction between these two factors. Whilst anxiety and the instruction to suppress separately increased stereotyping, when combined we observed no stereotype change. We tentatively suggest that this may be due to some form of response perseverance caused by resource depletion (via induced anxiety), such that the instruction to suppress continues to have an influence on stereotyping even when it is no longer a task requirement. These findings expand on the range of potential influences on suppression effects and importantly may point to cognitive load onset as being a crucial moderator of whether stereotyping will increase or not following suppression. On a broader level, the potential explanation for the perseverance of suppression gleaned from the literature in cognitive neuropsychology may be indicative of the efficacy of drawing on diverse areas of psychology in attempts to understand the processing determinants of attitudes and social behaviour.

## **REFERENCES**

- Devine, P. G., Monteith, M. J., Zuwerink, J. R. & Elliot, A. J. (1991). Prejudice with and without compunction. *Journal of Personality & Social Psychology*, *60*, 817-830.
- Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organisation of behaviour. *Psychological Review*, *66*, 183-201.
- Forster, J. & Liberman, N. (2001). The role of attribution of motivation in producing postsuppressional rebound. *Journal of Personality & Social Psychology*, *81*, 377-390.
- Gilbert, D. T. & Hixon, J.G. (1991).The trouble of thinking: activation and application of stereotypic beliefs. *Journal of Personality & Social Psychology*, *60*, 509-517.
- Heuer, F. & Reisburg, D. (1990). Vivid memories of emotional events: The accuracy of remembered minutiae. *Memory & Cognition*, *18*, 496-506.
- Humphreys, G. W., & Forde, E. M. E (1998). Disordered action schema and action disorganisation syndrome. *Cognitive Neuropsychology*, *15*, 771-811.
- Ingram, R. E. & Kendall, P. C. (1987). The cognitive side of anxiety. *Cognitive therapy and Research*, *11*, 523-536.
- Kahneman, D. (1973). *Attention and Effort*. Englewood Cliffs, NJ: Prentice Hall.

Knight, R. T. & Grabowecky, M. (1995). Escape from linear time: Prefrontal cortex and conscious experience. In M. S. Gazzaniga (Ed.) *The cognitive neurosciences* (pp1357-1371). Cambridge, MA: MIT Press.

Macrae, C. N., Bodenhausen, G. V. & Milne, A. B. (1995). The dissection of selection in person perception: Inhibitory processes in social stereotyping. *Journal of Personality & Social Psychology*, 69, 397-407.

Macrae, C. N., Bodenhausen, G. V. & Milne, A. B. (1998). Saying no to unwanted thoughts: Self-focus and the regulation of mental life. *Journal of Personality & Social Psychology*, 94, 578-589.

[249]

[250]

Macrae, C. N., Bodenhausen, G. V., Milne, A. B., & Jetten, J. (1994). Out of mind but back in sight: Stereotypes on the rebound. *Journal of Personality & Social Psychology*, 67, 808-817.

Macrae, C. N., Bodenhausen, G. V., Milne, A. B. & Wheeler, V. (1996). On resisting the temptation for simplification: Counterintentional effects of stereotype suppression on social memory. *Social Cognition*, 14, 1-20.

Macrae, C. N., Bodenhausen, G. V., Schloerscheidt, A. M. & Milne, A. B. (1999). Tales of the unexpected: Executive unction and person perception. *Journal of Personality & Social Psychology*, 76, 200-213.

Mandler, G. (1975). *Mind and emotion*. New York: Wiley

Monteith, M. J., Sherman, J. W. & Devine, P. G. (1998). Suppression as a stereotype control strategy. *Personality & Social Psychology Review*, 2, 63-82.

Monteith, M. J. (1993). Self-regulation of prejudiced responses: Implications for progress in prejudice-reduction efforts. *Journal of Personality & Social Psychology*, 65, 469-485.

Mueller, J. H. & Thompson, W. B. (1984). Test anxiety and distinctiveness of personal information. In H. M. Ploeg, R. Schwarzer & C. D. Spielberger (Eds.), *Advances in test anxiety research* (Vol. 3, pp 21-37). Hillsdale, New Jersey: Erlbaum.

Norman, D. A. & Shallice, T. (1986). Attention to action: Willed and automatic control of behaviour. In R. J. Davidson, G. E. Schwartz & D. Shapiro (Eds.), *Consciousness and self regulation*. New York: Plenum Press.

Pineda, D. A. (2000). Executive function and its disorders. *Revista de Neurologia*, 30, 764-768.

Schallice, T. (1988). *From neuropsychology to mental structure*. Cambridge: Cambridge University Press.

Stephan, W. G. & Stephan, C. W. (1985). Intergroup Anxiety. *Journal of Social Issues*, 41, 157-175.

Stuss, D. T. & Alexander, M. P. (2000). Executive function and the frontal lobes: A conceptual view. *Psychological Research-Psychologische Forschung*, 63, 289-298.

Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review*, 101, 34-52.

Wegner, D. M. & Erber, R. (1992). The hyperaccessibility of suppressed thought. *Journal of Personality & Social Psychology*, 63, 903-912.

Wegner, D. M., Schneider, D. J., Carter, S. R. & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality & Social Psychology*, 53, 5-13.

Wilder, D. A., & Shapiro, P. (1989). Effects of anxiety on impression formation in a group context: An anxiety-assimilation hypothesis. *Journal of Experimental Social Psychology*, 25, 481-499.

Wyer, N. A., Sherman, J. W. & Stroessner, S. J. (1998). The spontaneous suppression of racial stereotypes. *Social Cognition*, 16, 340-352.

Wyer, N. A., Sherman, J. W. & Stroessner, S. J. (2000). The roles of motivation and ability in controlling the consequences of stereotype suppression. *Personality & Social Psychology Bulletin*, 26, 13-25.

Yzerbyt, V. Y., Corneille, O., Dumont, M. & Hahn, K. (2001). The dispositional inference strikes back: Situational focus and dispositional suppression in causal attribution. *Journal of Personality & Social Psychology*, 81, 365-376.

[250]

[251]

## ENDNOTES

[1] Providing that the participant is low in prejudice, if the participant is highly prejudiced, then increasing self focus will increase expression of stereotypic thoughts (Macrae, et al., 1998).

[2] This is in line with other work demonstrating that stereotype activation does not ensure its expression (Gilbert & Hixon, 1991) and that rebound effects are not inevitable (simply telling participants that suppression is a difficult process eliminates the rebound effect, Forster & Liberman, 2001). Forster & Liberman suggested that the knowledge that suppression isn't easy, prevented participants from attributing the hyperaccessibility of the suppressed concept to a motivation to express that concept.

[3] For instance, Macrae, Bodenhausen, & Milne (1995) in this cultural context found the Chinese stereotype to consist of attributes such as "gracious," "calm," "trustworthy," and "considerate."

[4] Stereotypic: Achieving a high mark in a test  $t(27)=15.40, p < .001$ , sitting down to a family meal  $t(27)=11.67, p < .001$ . Counter-stereotypic: Going to a night-club  $t(27)=-2.78, p < .02$ , working in a supermarket  $t(27)=-2.52, p < .02$ . Neutral: Watching TV  $t(27)=1.71, p = ns$ , socialising in a wine bar  $t(27)=-.92, p = ns$ .

[5] Stereotypic words were intelligent:  $t(27)=9.78, p < 0.001$ ; family orientated:  $t(27)=10.83, p < .001$ ; disciplined:  $t(27)=14.40, p < .001$ ; and traditional:  $t(27)=11.74, p < .001$ . Counter-stereotypic words were inconsiderate:  $t(27)=-4.64, p < .001$ ; offensive:  $t(27)=-5.24, p < .001$ ; lazy:  $t(27)=-5.97, p < .001$ ; and careless:  $t(27)=-6.17, p < .001$ . Filler (neutrally stereotypic) were approachable:  $t(27)=-.095, p = ns$ ; stern:  $t(27)=1.37, p = ns$ ; defensive:  $t(27)=1.18, p = ns$ ; and unsympathetic:  $t(27)=-.58, p = ns$ .

**APPENDIX A. CORRELATIONS BETWEEN ANXIETY AND STEREOTYPE CHANGE BY CONTROL AND EXPERIMENTAL CONDITIONS (\*' INDICATES P < .05)**

**Control**

	Stereotype change	Anxiety
Stereotype change		-.073
Anxiety	-.073	

**Experimental**

	Stereotype change	Anxiety
Stereotype change		-.403*
Anxiety	-.403	

[251]

-----  
[252]

**AUTHORS' NOTE**

We would like to thank Wendy Allen, Peter Byers, Jennifer Mills and Alex King for their help in conducting this research.

## **AUTHORS' BIOGRAPHIES**

Natalie R. Hall is currently a doctoral student at the School of Psychology, University of Birmingham, UK. Her research is focusing on integrating of social cognitive and social identity effects in person perception. E-mail: [nrh873@bham.ac.uk](mailto:nrh873@bham.ac.uk)

Richard J. Crisp is a lecturer at the School of Psychology, University of Birmingham, UK. His research focuses on social identity and social cognitive models of social categorization and intergroup relations. E-mail: [r.crisp@bham.ac.uk](mailto:r.crisp@bham.ac.uk).

[252]

-----  
[253]