Contemporary Hypnosis
22(4): 171–183 (2005)
DOI: 10.1002/ch.13

DIFFERING ROLES OF IMAGINATION AND HYPNOSIS IN SELF-REGULATION OF EATING BEHAVIOUR

Susan Hutchinson-Phillips[1], Graham A Jamieson[2] and Kathryn Gow[1]

[1]Queensland University of Technology, Australia,
[2]University of New England, Australia

Abstract

This study investigates the role of hypnosis-like and imagery processes in the self-regulation of eating behavior. Eighty participants were assessed on measures of eating behaviour (EAT), body image (CDRS), trait measures of hypnotic ability (HGSHS:A) and imaginative ability (CIS) as well as process measures (ICMI, SIPI and PCI) spanning both domains. Imagination and hypnosis measures show distinct patterns of relationships with eating behaviour and body image measures. Results emphasize the importance of assessing process as well as trait or ability measures and the utility of the Phenomenology of Consciousness Inventory (PCI) to this approach. Therapeutic implications are drawn for integrating hypnosis and imagination procedures in cognitive behaviour therapy (CBT) of eating disorders. Present findings should be confirmed in a larger sample and the emerging model tested utilizing Structural Equation Modelling. Copyright © 2005 British Society of Experimental & Clinical Hypnosis. Published by John Wiley & Sons, Ltd.

Key words: CBT, eating disorders, hypnosis, imagination, Phenomenology of Consciousness Inventory, self-regulation.

Introduction

Kirsch and colleagues (Kirsch, Montgomery and Sapirstein, 1995; Kirsch, 1996) conducted a careful meta-analysis of the treatment benefits of CBT weight loss studies either alone or when combined with hypnosis which demonstrated significantly enhanced outcomes for the combination of hypnosis and CBT over CBT alone. Kirsch (1996) reported that the benefit produced by hypnosis and CBT combined exceeded the benefit of 78% of clients who had received CBT alone. Furthermore, this additional benefit was even more evident over time. The core of cognitive behavioural therapy lies in the enhancement of effective self-regulation of behaviour. The enhanced efficacy of CBT in the control of weight loss when combined with hypnosis clearly suggests the possibility that hypnosis and related processes may play an important role, at least in some individuals, in the effective self-regulation of eating behaviour.

Several studies also suggest a corresponding role for hypnotic susceptibility (and thus hypnosis related processes) in the disordered self-regulation of some aspects of eating behaviour. Pettinati, Horne and Staats (1985) reported the first evidence for a link between hypnotizability and bulimia. Their subjects included 21 bulimics, 19 restricting anorexics and 46 vomiting/purging anorexics. They reported that hypnotizability, measured on the SHSS:C (Weitzenhoffer and Hilgard, 1962), was significantly higher in bulimics than in bingeing and purging anorectics ($p < 0.001$). Groth-Marnat and

Schumaker (1990) examined the hypnotic susceptibility scores of a college population (102 females) to investigate the possibility that non-patient subjects with high body shape and weight concerns might also be highly hypnotizable. Using the HGSHS:A (Shor and Orne, 1962), the Eating Attitudes Test (Garner and Garfinkel, 1979) and the Goldfarb Fear of Fat Scale, they found that students who were concerned with body shape and weight were more hypnotizable. Barabasz (1991) compared forty bulimics with the same number of controls using the SHSS:C and the BULIT (Bulimia Test). The mean hypnotizability score for the experimental group was significantly higher than that for the controls. Kranhold, Baumann and Fichter (1992), using the German translation of the HGSHS:A, revealed higher scores for bulimics than for controls. Vanderlinden, Spinhoven, Vandereycken and Van Dyck (1995) found that eating disordered subjects scored higher on the Stanford Hypnosis Clinical Scale (SHCS:A) than did controls.

Hypnosis, imagery ability and self-regulation of eating

Wybraniec and Oakley (1996) reported a positive correlation between the Creative Imagination Scale (CIS: Wilson and Barber, 1978), a measure of imaginative ability (McConkey, Sheehan and White, 1979; Hilgard, Sheehan, Monteiro and Macdonald, 1981) correlated with both hypnotic susceptibility (Sapp and Evanow, 1998), and 'cognitive restraint', the first factor of the Three Factors Eating Questionnaire (3-FEQ; Stunkard and Messick, 1985). They also found significant differences between the scores of restrained and non-restrained eaters on a modified CIS. The modifications involved the addition of two suggestions regarding increasing and decreasing body size respectively. Those who indicated that they practised restrained eating scored significantly higher on the increased body size suggestion. This ingenious experiment examined body image, one of the major aspects of dysfunctional eating, according to both cognitive behavioural and feminist viewpoints.

This finding was replicated by Frasquilho and Oakley (1997; but see Griffiths and Channon-Little, 1995), who reported that imaginative ability (CIS) was significantly correlated with only the cognitive restraint factor of the Three Factors Eating Questionnaire ($r = 0.66$, $p < 0.001$). These results suggest that high imaginative ability influences the internalization of socio-cultural body ideals and may (at least in some cases) be related to a tendency to restrict food intake. Further indication that this concept might be worth serious consideration and further investigation, was provided in the study by Frasquilho, Oakley and Ross-Anderson (1998) in which the CIS correlated significantly with two measures of dietary restraint. Again restrained eaters were more susceptible to body image modification, especially size expansion. Oakley and Frasquilho (1998) contend that disturbed body image, in which hypnotic and/or imaginative ability may be engaged, plays an important role in the disordered regulation of eating behaviour.

Hypnosis, imagination and dissociative symptoms

Using the Inventory of Childhood Memories and Imaginings (ICMI: Wilson and Barber, 1983) to assess life patterns of engagement in imagery and fantasy, Lynn and Rhue (1991) found as many as 80% of fantasy prone individuals tested as highly hypnotizable. However the overall correlation was modest (r = about 0.25) between hypnotizability and fantasy proneness. Although hypnotic and imaginative abilities are related the processes that engage them cannot be considered to be identical.

Rhue, Lynn and Sandberg (1995) emphasized that the majority of high fantasizers appear to be well adjusted. However, Lynn and Neufeld (1996) noted that instances of childhood abuse and lonely childhoods were over-represented amongst their subjects who were fantasizers. About 20–30% of habitual fantasizers exhibited significant signs of maladjustment, psychopathology or deviant ideation. Irwin (1999) found that fantasy prone subjects exhibited more symptoms of psychopathology.

The Short Imaginal Processes Inventory (SIPI: Huba, Singer, Aneshensel and Antrobus, 1982) has identified three daydreaming styles. A positive and constructive or happy daydreaming style (PCD) was marked by pleasant feelings and positive attitudes towards daydreaming. A guilty-fear-of-failure style (GFF) exhibited fear of failure typical of obsessional and neurotic individuals, and was associated with themes of guilt and sadness. A poor attentional control style (PAC) was marked by anxiety and a tendency towards distractibility. The latter two styles were more likely to be correlated with maladaptive behaviours.

Rhue, Lynn and Sandberg (1995) noted correlations ranging from $r = 0.43$ to $r = 0.63$ for imagination and dissociation scores. Lynn, Neufeld, Green, Sandberg and Rhue (1996) concluded that a person's control over fantasy, imagination and self-absorbed attention might well be the crucial factor that differentiates healthy imaginative tendencies from pathological variants such as dissociation.

Dissociative symptoms and disordered self-regulation of eating behaviour

Vanderlinden, Vandereycken, Van Dyck and Vertommen (1993) examined the relationship between traumatic life events, dissociation and eating disorders with 98 eating disordered patients using the Dissociation Questionnaire (DIS-Q; Vanderlinden, Van Dyck, Vandereycken, Vertommen and Verkes, 1993). They found that those experiencing more (and more serious) trauma scored higher on the DIS-Q particularly on the amnesia subscales. The highest scorers were those who had experienced sexual abuse. Their hypothesis was that trauma led to the development of a subgroup of patients with an eating disorder.

Vanderlinden, Spinhoven, Vandereycken and Van Dyck (1995) obtained the scores of 53 eating disorder patients on the DIS-Q, the Stanford Hypnotic Clinical Scale: Adult (Morgan and Hilgard, 1978–9), the Dutch Phenomenology of Consciousness Inventory (short form of PCI; Pekala, 1982) and found that both dissociation and hypnotizability scores were higher for bulimics than for mixed anorexics, who in their turn, scored higher than anorexics. The PCI importantly provides a window on the actual changes in cognitive processes engaged in hypnotic experience as distinct from the standard trait measures of hypnotic ability. Differences on the DIS-Q Loss of Control subscale were also significant. They found a low positive correlation between the DIS-Q and the SHCS:A, suggesting that these instruments are testing related, but different, capacities. Santonastaso, Favaro, Olivotto and Friederici (1997) also reported that scores on the loss of control scale (DIS-Q) were highest for eating disordered individuals with a history of sexual abuse.

Vanderlinden and Vandereycken developed the Dissociation Questionnaire specifically in the context of eating disorder research. Four subscales have been identified by factor analysis: identity confusion, loss of control, amnesia and absorption. Unlike other dissociation measures, it does not include fantasy or imagination content items. Instead the content clearly refers to failures of executive monitoring or control over ongoing cognitive processes. Conceptually these phenomena appear to share important features

with those described by Woody and Bowers' (1994) model of the hypnotic process as involving a (relative) functional inhibition of the influence of the Supervisory Attentional System (SAS: Norman and Shallice, 1986). Jamieson and Sheehan (2004) further extended that model to incorporate a relative dissociation between monitoring and control functions of the SAS. On this account, dissociative symptoms and hypnotic phenomena may both engage similar alterations in the processes of cognitive control.

This study seeks to explore the contribution of hypnotic and imaginative abilities to aspects of body image and the self-regulation of eating behaviour in a normal college sample, that is, to core components of cognitive behavioural models of eating disorders. Cognitive behavioural models (and interventions) focus on processes of self-regulation. In order to understand the role of such factors, this study will also assess the way in which these abilities have been incorporated in the life history, habitual coping strategies and current cognitive processes of participants and how they relate both to bodily self perception and the self-regulation of eating behaviour.

It is hypothesized that the trait of hypnotizability will be linked to the control of eating behaviour through the disruption of processes of executive control. By contrast the trait of imagery ability is expected be linked to the control of eating through the childhood development of habitual patterns of negative self-imagery and the construction of a self-regulating body image.

Method

Participants

Preliminary investigation of the interrelationships implicit in the proposed model was undertaken using a sample of undergraduate and postgraduate students involved in psychological studies in hypnosis at the Queensland University of Technology. Eighty students who were willing to be involved in the study were recruited by the chief researcher who addressed the groups involved explaining the nature of the study, and its advantage to their current educational programme by virtue of their completion of a number of activities which would help them learn about the essence of hypnosis and its correlates in a unique and practical way. Of these 80 participants, whose ages ranged from 18 to 57 years (mean = 30.3, SD, 11.1), 20 were males and 60 were females, which is the usual ratio of males to females enrolled in hypnosis units.

Assessment tools

A number of assessment instruments, which currently represent the best expressions of theorizing about the relevant concepts, were employed. These assessments were chosen because of their use in other studies to which this research owes its genesis and because of their potential utility for further research with clinical populations. For this reason, brevity in individual tests was preferred.

Assessment of eating behaviour and body image

Eating Attitude Test (EAT; Garner and Garfinkel, 1979): According to Garner, who developed this assessment, this is probably one of the most widely used standardized assessments of the concerns and symptoms characteristic of those with eating problems, and in particular, those with anorexic tendencies. This test is a short (26 item) self-report scale. A number of statements, such as 'I am terrified about being overweight' and 'I find myself preoccupied with food' are linked to categories ranging from Always to Never

(Always, Usually, Often, Sometimes, Rarely, Never).

The results from this scale are divided into three subscales. These include dieting, banned food preoccupation, and oral control (which reflects the subject's ability to restrict food intake). While this scale is not intended to be used as a diagnostic tool, it is useful as a screening device or to assess changes in behaviours as the result of treatment. However, a score of 20 or above usually indicates the need for further investigation of the possibility of the existence of an eating disorder. Diagnosis with the Eating Disorders Inventory – 2 (Garner, 1991, cited in Garner, 1997) is recommended for those who score above 20 on this brief, clinically efficacious scale.

Contour Drawing Rating Scale (Thompson and Gray, 1995): Intrinsic to the sociocultural interpretation of the aetiology and maintenance of self-defeating eating, is the centrality of objectification of the body and intense dissatisfaction with body image. Therefore, the inclusion of assessments which rate subjective impressions of various physical attributes, particularly of aspects which are indicative of concerns with weight and shape, would provide further information to that gained by using the EAT and the 3-FEQ. One method by which body image disturbance has traditionally been assessed involves using silhouette drawings of varying body weights, shapes and sizes, from which participants are required to identify those figures which most closely correspond to their actual body, their ideal body, and the body size that they currently feel. Thompson and Gray's (1995) groups of silhouettes are the ones most commonly employed for this purpose, and studies by Williamson, Davis, Bennett, Goreczny and Gleaves (1989) and by Williamson, Davis, Goreczny and Blouin (1989) have demonstrated that the choices made by respondents do reflect these differences. Body dissatisfaction was established as the reason for these discrepancies by Williamson, Gleaves and Watkins (1993).

Assessment of hypnotic susceptibility

Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A): The Harvard Group Scale of Hypnotic Susceptibility: Form A (Shor and Orne, 1962) consists of 12 items, which are scored by the participant, and which include ideomotor suggestions, challenge items and a number of requests for cognitive alterations, delivered after an initial relaxation induction. Scoring is pass/fail, and arranges the subject by scores into Low, Medium and High Hypnotizable categories. This scale has been widely used in research, and its validity and reliability are well established. Published norms have included Australian, German, Canadian, Spanish, Danish and Japanese samples. Internal reliability is high (> 0.90), and it correlates moderately well with the Stanford Hypnotic Susceptibility Scale: Form C (Weitzenhoffer and Hilgard, 1962) at around 0.60 (Register and Kihlstrom, 1986).

Phenomenology of Consciousness Inventory (PCI; Pekala, 1982, 1991) This is a 53 item scale on which the respondent is requested to rate subjective experience in relation to sensations, perceptions, feelings, thoughts, imagery and impressions on a 7- point scale ranging from one dipole of a continuum to the other, for example, 'My thinking was clear and understandable' (left dipole) to 'My thinking was unclear and not easy to understand' (right dipole). It is administered in relation to a 'sitting quietly' time of two minutes, which is embedded in the HGSHS:A, and the questionnaire is completed at the end of the HGSHS:A in relation to the experience of that period. Scoring is generated from measured intensity of experience in 26 dimensions of which the following are of interest in this study: sense of an altered state, imagery total, vividness of imagery, amount of imagery, perceived extent of absorption, altered experience, volitional control, time sense and body image.

Assessment of imaginative/fantasy ability

The Creative Imagination Scale (CIS; Wilson and Barber, 1978, 1979): This scale, which can be used with or without an induction (and was delivered without an induction in the current study, to replicate administration in the Frasquilho research) consists of ten items, which are scored by the subject using a 5-point Likert scale comparing the likeness of each response to the suggested experience. Considering a total possible score of 40 points, subjects are classified into groupings of low, medium low, medium high and high. Test-retest reliability of 0.82 has been established, and correlations with the HGSHS:A (0.55) and the SHSS:C (0.60) have been found (Monteiro, MacDonald and Hilgard, 1980).

Short Imaginal Processes Inventory (SIPI; Huba, Singer, Aneshensel and Antrobus, 1982): This self-report assessment consists of 45 items, rated on a 5-point Likert type scale, for example, 'My fantasies usually provide me with pleasant thoughts' with responses ranging from 'very true of me' to 'strongly uncharacteristic of me'. Scoring identifies three different types of daydreams – positive constructive, guilt and fear of failure and a style marked by poor attentional control. This scale highlights the manner in which imaginings are utilized by the individual participant.

Inventory of Childhood Memories and Imaginings (ICMI; Wilson and Barber, 1983): The purpose of this self-report inventory, which requires true or false responses to 48 propositions, is to provide data regarding imaginative and fantasy activities remembered from childhood. The higher the score, the greater the proneness to fantasy and imagination, with groupings corresponding to low, medium low, medium high and high imaginative abilities. Lynn and Rhue (1986, 1988; Lynn, Green, Rhue, Mare and Williams, 1990) have used this test to establish high fantasy-prone subjects in relation to hypnotizability in an extensive study of imaginative abilities. Green, Kvaal, Lynn, Mare and Sandberg (1991) noted significant correlations between this instrument and dissociative experiences (measured by the Dissociative Experiences Scale).

Assessment of dissociative capacity

Dissociation Questionnaire (DIS-Q; Vanderlinden, Van Dyck, Vandereycken, Vertommen and Verkes, 1993): Of the large number of dissociation questionnaires available, that developed by Vanderlinden and his colleagues was chosen because it was developed by a team experienced in working with eating disorders. Factor analysis has identified four subscales – identity confusion-fragmentation, loss of control, amnesia and absorption – a division which has been satisfactorily replicated (Vanderlinden, 1993; Vanderlinden, Van Dyck, Vandereycken, Vertommen and Verkes, 1993). The DIS-Q can be useful for screening for dissociative disorders, as well as for use in a general (research) population.

Method of administration

Because of the nature of the recruitment process, the context was already defined as hypnosis related, which is acknowledged as a potential limitation of the study. Participants were students enrolled in hypnosis units who understood that the research related to hypnosis constructs, which could lead to heightened expectations and perhaps distort results. However, to lessen the possible contextual effects, the assessments were presented as early as possible in the courses of study. One group was presented first with the Creative Imagination Scale (n = 29), then the Harvard Scale was undertaken several weeks later. For the other group (n = 37), the Harvard Scale and the PCI were experienced initially, followed by the CIS at a later date. As no statistical differences were found, results from both groups were treated in the same manner.

Administration of the complement of tests took place over three sessions for each group. Consequently, some participants were absent for some sessions, or chose not to participate in some assessments. However, all available results have been included in the final statistical analyses.

Results

Eating behaviours and concerns with weight and shape

As expected significant correlations were obtained between overall EAT scores and those aspects of self-perceived body image assessed by the CDRS (see Table 1). Of particular interest was the pattern of correlation between the different EAT subscale scores and the weight and shape measures of the CDRS. Oral control stands apart from dieting and food preoccupation in not being significantly correlated with any of the CDRS body image measures. Oral control appears unrelated to the perceived need to restrain dietary intake as indicated by weight and shape concerns.

Table 1. Significant correlations between other CDRS weight/shape related scores, and eating behaviour scores on the EAT

	Ideal Body	Actual Body	Felt Body	Actual-Ideal
Dieting		0.339**	0.370**	0.407**
Food Preoccupation			0.304*	0.303*
Oral Control				
EAT	–0.246*	0.305*	0.346**	0.389**

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Phenomenology of Consciousness Inventory

Ideal body size (Ideal-B, see Table 2) was significantly negatively correlated withPCI process measures of Alteration in Experience ($r = –0.345$, $p < 0.01$), with AlteredBody Image ($r = –0.271$, $p < 0.05$), and with Altered Time Sense ($r = –0.313$, $p < 0.01$). Another set of relationships emerged around the correlations of the Oral Control factor of the EAT with the PCI intensity ratings for Amount of Imagery, Vividness of Imagery, Altered Experience, Alterations of Body Image, and changed Time Sense. Both Imagery and Vividness of Imagery intensities also had small, but significant, correlations with the full score of the Eating Attitudes Test. Those participants who reported themselves as higher in the control of food intake also reported larger amounts of vivid imagery and greater alterations in their sense of time and body image during hypnosis. These relationships between the PCI dimensions and the scores on body shape and eating inventories, are outlined in Table 2.

Hypnotizability (HGSHS:A) and Imagery Ability (CIS)

One-way analyses of variance suggested that there were no significant differences in scores as a result of order of administration of the CIS and the HGSHS:A. As previously mentioned, scores from both groups were subjected to the same statistical testing.

Table 2. Significant correlations between PCI dimension intensities and other variables in this study

	Alt Exp	Alt Stat	Absorp	Vol Con	Time	Bod Im	Imag	Im Viv	Im Amt
CIS		0.330*					0.344*	0.294*	0.315*
HGSHS	0.491**	0.470**	0.296*	–0.386**	0.580**	0.383**			0.257*
DIS-Q	0.282*				0.449**				
DIET									
F PRE									
OC	0.330*				0.300*	0.293*	0.329*	0.333*	0.286*
EAT							0.274*	0.267*	
ICMI							0.324*		0.389**
Ideal-B	–0.345**				–0.313**	–0.271*			

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Note: The following are all measures of intensity of the indicated PCI dimension; Alt Exp (altered experience), Alt Stat (altered state), Absorp (absorption), Vol Con (voluntary control), Time (time sense), Bod Im (altered body image), Imag (imagery total), Im Civ (vividness of imagery), Im Amt (amount of imagery).

There was a significant relationship between the HGSHS:A ($r = 0.266$, $p < 0.01$) and the Oral Control factor of the EAT, which again suggests that hypnotic susceptibility and the control of food intake may be linked. Neither the Harvard Group Scale of Hypnotic Susceptibility or Creative Imagination Scale was significantly related to any other aspect of eating behaviour (EAT) or of body image (CDRS) measured in this study. Further the CIS and the HGSHS:A were themselves not significantly related in this sample ($r = 0.263$). The HGSGS:A and the CIS were however clearly differentiated by distinct profiles of association with the processes measures on the Phenomenology of Consciousness Inventory (see Table 2).

The CIS was significantly related to each of the PCI dimensions: Altered state, Imagery total, Imagery Vividness and Amount of Imagery. By contrast the HGSHS:A correlated significantly with every PCI process measurement included in this study apart from Imagery total and Imagery Vividness intensities. It would seem that the PCI robustly measures many of the facets of the change in cognitive processes elicited by the HGSHS:A. However, it also reflects the distinctively different processes (fantasy and imagination) that are tapped by the CIS when it is administered without a hypnotic induction.

Process Measures of Fantasy and Imagination

The ICMI has a significant relationship with both Positive Constructive Daydreaming ($r = 0.284$, $p < 0.05$) and Guilt and Fear of Failure ($r = 0.243$, $p < 0.05$) daydreaming styles. There is no significant relationship between the CIS and either ICMI or any of the SIPI daydreaming styles confirming the distinction between ability and process based imagery measures.

See Table 2 for a comparison the relationship of the ICMI and CIS with various facets of the PCI, particularly with the measures of total imagery, vividness of imagery and amount of imagery generated. There were no significant correlations between SIPI daydreaming styles and imagery processes tapped by the PCI. The SIPI in particular

seems to be measuring the way in which imagery is employed in the life of the person rather than how often, or how vividly, it is employed. A significant correlation was found between Positive Constructive Daydreaming (PCD) and hypnotic susceptibility ($r = 0.330$, $p < 0.05$).

Importantly the ICMI was found to have significant negative correlations with several elements of body image measured on the CDRS: actual size ($r = –0.250$, $p < 0.05$); felt size ($r = –0.278$, $p < 0.05$); and ideal size ($r = –0.288$, $p < 0.05$). ICMI scores appear to be related to a smaller perceived and desired body image.

Dissociative symptoms

DIS-Q scores of dissociative symptoms (disruptions in executive control) were significantly positively correlated with both Food Preoccupation ($r = 0.344$, $p < 0.05$) and Oral Control ($r = 0.301$, $p < 0.05$) factors of the EAT. DIS-Q scores were even more significantly negatively correlated with CDRS body ideal ($r = –0.383$, $p < 0.01$). Significant correlations were also found between DIS-Q (dissociative symptoms/lapses of executive control) and measures of fantasy and imagination process measures of the ICMI ($r = 0.392$, $p < 0.01$) and GFF daydreaming style ($r = 0.280$, $p < 0.05$). It has been suggested in the literature that most of the dissociation scales appear to measure fantasy capacities, and that the DIS-Q is notable for the absence of such a factor. Memories of using fantasy and imagination in childhood may share a common pathway with a tendency to have (or to report) dissociative symptoms in adulthood.

Discussion

Hypnotic susceptibility (at least as measured by the HGSHS:A) was significantly related to the Oral Control factor of the EAT questionnaire of eating disorder related behaviours. Susceptibility was unrelated to other aspects of disordered eating behaviour such as dietary restraint and food preoccupation; nor was it related to CDRS measures of body image used in this study.

In contrast to the findings of Oakley and colleagues, the Creative Imagination Scale was unrelated to any aspect of disordered eating behaviour or body image measured in the non clinical sample used in this study, nor was it significantly related to hypnotic susceptibility. The profile of correlations of the HGSHS:A with PCI experience dimensions (rated for a period during hypnosis) did not include Imagery total or Imagery vividness, however numerous other alterations in experience were consistently related. This contrasts almost diametrically with the pattern of associations of the CIS where significant relationships with ongoing changes in the processes of consciousness were found for all imagery related dimensions (Imagery Amount, Imagery Vividness and Total Imagery), but only for one other process dimension – altered experience. This clearly supports the interpretation of the CIS specifically as an imagery ability measure and not as an alternative measure of hypnotic susceptibility. Likewise hypnotic susceptibility does not appear as an alternative measure for imagery ability. This study then found no evidence that imagery ability per se plays a direct role in the development of disordered eating behaviours.

By contrast, the ICMI assesses the life history of habitual imagery use and the SIPI assesses the affective style of personal imagery use in daydreaming and imagining. These measures assess aspects of the person's imagery processes, rather than their imagery ability (although the two may be related). The ICMI is significantly (negatively) related to several aspects of body image central to cognitive behavioural models of self-

regulation of eating behaviour. The Guilt and Fear of Failure daydreaming style is significantly related both to the ICMI and experiences of disruption in executive control (control of memory, control of attention, sense of self and sense of reality). These dissociative symptoms (the Dis-Q) are also directly related to Food preoccupation and Oral control and negatively related to ideal body size. These findings point to the role and nature of imagination in the person's habitual coping strategies, rather than to imagery ability in itself (although, of course, a certain amount of ability will be necessary) as contributing factors to the development and maintenance of disordered eating behaviours.

In this study, the PCI measured changes in the dimensions underlying the construction of experience during hypnosis. That is, rather than measuring the trait of hypnotic susceptibility it measured the experience of processes evoked by hypnosis. Significant positive correlations were found between the dimensions of Altered Experience, Time Sense, Body Image, Imagery Vividness, Imagery Amount and Imagery Total and the Oral Control factor of the EAT. In addition, significant negative relationships emerged between Altered Experience, Time Sense and Body Image and the perception of ideal body size on the CDRS. The PCI clearly distinguished between measures of hypnotic susceptibility and imagery ability and a significant relationship was found between Altered Experience and Time Sense dimensions during hypnosis and the dissociative symptoms tapped by the Dis-Q.

Processes engaged by hypnosis and tapped by the PCI were found to be directly related both to aspects of the control of eating behaviour and to perceptions of ideal body size. In addition, PCI dimensions were also related to other variables (ICMI and DIS-Q), which were themselves related to these and other aspects of body perception and eating behaviour. The utility of process related measures (the PCI, ICMI and SIPI), in addition to more traditional ability measures, in understanding the role of hypnosis and imagination in the regulation (or disregulation) of eating behaviour is perhaps the most important finding of this study.

Although preliminary, present results begin to suggest an outline of the distinctive contributions of hypnosis and imaginative processes to the disordered control of eating behaviour. Imagination is a part of adaptive activity that contributes to organizing the meaning of events, planning for the future and in general assists to guide individuals through their world and help them to achieve their goals. Patterns of imagining develop over time, which reflect personal concerns, incorporate self-appraisals, regulate mood, and bias learning and decision making. Imagination, habitually engaged as a coping mechanism in the form of negative self-images and fantasies, may well contribute to the internalization of negative perceptions of body image and identification with an unrealistic socially based 'thin ideal' with subsequent consequences for behavioural self-regulation. Therapeutic interventions targeted at this pathway may include the identification and awareness of dysfunctional patterns of imagination and their replacement by positive alternatives (see, for example, Lynn, Rhue, Kvaal and Mare, 1993).

Hypnosis results in a relative inhibition of at least some aspects of executive control. In healthy adaptation, this process is temporary, reversible and ultimately under self-control. Release from executive inhibition may facilitate the emergence of a free flowing primary process like stream of consciousness which may be employed by the individual for the purposes of creative adaptation (regression in the service of the ego). However, when engaged for defensive purposes, the executive control of attention, memory, thought and behaviour may be periodically or chronically disrupted (giving rise to dissociative symptoms) by the same processes evoked in the hypnotic context. In the context of eating behaviour, this may result in disruption of attempts at self-regulation, impulsive

and compulsive behaviours and a distressing sense of personal disintegration and being out of control. In this case, therapeutic interventions would target the strengthening of executive control, personal identity and boundaries and the adaptive mastery of trance processes (see, for example, Nash and Baker, 1993).

Of course, these pathways are not mutually exclusive and they may even interact. Clearly they are not the only pathways to disordered eating, but they may be important for some individuals. They may also suggest specific strategies for the incorporation of imagery and hypnosis procedures into the cognitive behavioural treatment of dysfunctional eating behaviour.

While richly suggestive, the findings of the present study are of a most preliminary nature. They are based on an entirely correlational analysis and multiple comparisons may have inflated the type 1 error rate. In the first instance, they require replication on a larger sample. More precise relational hypotheses, derived from the present study, require to be tested incorporating a multiple regression approach with an adequate subject to variable ratio in order to control for the effects of multiple comparisons. In the next step, specific causal models suggested above may be directly tested using Structural Equation Modelling. Finally, this research must be extended from normal to appropriate clinical samples.

Acknowledgement

The authors would like to thank Catherine Kumar for her assistance in the preparation of this paper.

References

Barabasz M (1991) Hypnotizability in bulimia. International Journal of Eating Disorders 10(1): 117–20.

Frasquilho F, Oakley D (1997) Hypnotizability, dissociation and three factors of eating behaviour. Contemporary Hypnosis 14(2): 105–11.

Frasquilho F, Oakley D, Ross-Anderson D (1998) Hypnotizability and body image malleability in restrained and non-restrained eaters. Contemporary Hypnosis 15(2): 84–93.

Garner, DM (1997) Psychoeducational principles in treatment. In: DM Garner, PE Garfinkel (eds) Handbook of Treatment for Eating Disorders, 2nd edn. New York: Guilford Press.

Garner DM, Garfinkel PE (1979) The Eating Attitudes Test: An Index of the Symptoms of Anorexia Nervosa. Psychological Medicine 9(2): 273–9.

Green JP, Kvaal MS, Lynn SJ, Mare MS, Sandberg MS (1991) Cited in SJ Lynn, H Sivec, The hypnotizable subject as creative problem-solving agent. In: E Fromm, MR Nash (eds) (1992) Contemporary Hypnosis Research. New York: The Guilford Press, 305.

Griffiths RA, Channon-Little LD (1995) Dissociation, dieting disorders and hypnosis: a review. European Eating Disorders Review 3(3): 148–59.

Groth-Marnat G, Schumaker JF (1990) Hypnotizability, attitudes toward eating, and concern with body size in a female college population. American Journal of Clinical Hypnosis 32(3): 194–200.

Hilgard ER, Sheehan PW, Monteiro KP, Macdonald H (1981) Factorial structure of the Creative Imagination Scale as a measure of hypnotic responsiveness: an international comparative study. International Journal of Clinical and Experimental Hypnosis 29(1): 66–76.

Huba GJ, Singer JL, Aneshensel CS, Antrobus JS (1982) The Short Imaginal Process Inventory. Port Hurson, MI: Research Psychologists Press.

Irwin HJ (1999) Pathological and nonpathological dissociation: the relevance of childhood trauma. Journal of Psychology 133(2): 157–64.

Jamieson GA, Sheehan PW (2004) An empirical test of Woody and Bowers' dissociated-control theory of hypnosis. International Journal of Clinical and Experimental Hypnosis 52: 232–49.

Kirsch I (1996) Hypnotic enhancement of cognitive-behavioral weight loss treatments – another meta-reanalysis. Journal of Consulting and Clinical Psychology 64(3): 517–19.

Kirsch I, Montgomery G, Sapirstein C (1995) Hypnosis as an adjunct to cognitive-behavioral psychotherapy: a meta-analysis. Journal of Consulting and Clinical Psychology 63(2): 214–20.

Kranhold C, Baumann U, Fichter M (1992) Hypnotizability in bulimic patients and controls: a pilot study. European Archives of Psychiatry and Clinical Neuroscience 242: 72–6.

Lynn SJ, Green JP, Rhue JW, Mare C, Williams B (1990) Cited in SJ Lynn, H Sivec, The hypnotizable subject as creative problem-solving agent. In E Fromm, MR Nash (eds) (1992) Contemporary Hypnosis Research. New York: The Guilford Press, 292–333.

Lynn SJ, Neufeld VA (1996) Fantasy styles, hypnotic dreaming and fantasy proneness. Contemporary Hypnosis 13(1): 4–12.

Lynn SJ, Neufeld V, Green JP, Sandberg D, Rhue J (1996) Daydreaming, fantasy, and psychopathology. In RG Kunzendorf, NP Spanos, B Wallace (eds) Hypnosis andImagination. New York: Baywood, 268–306.

Lynn SJ, Rhue JW (1986) The fantasy prone person: hypnosis, imagination, and creativity. Journal of Personality and Social Psychology 51(2): 404–8.

Lynn SJ, Rhue JW (1988) Fantasy proneness: hypnosis, imagination, and creativity. American Psychologist 43(1): 35–44.

Lynn SJ, Rhue JW (1991) Fantasy proneness: hypnosis, developmental antecedents and psychopathology. American Psychologist 43: 35–44

Lynn SJ, Rhue JW, Kvaal S, Mare C (1993) The treatment of anorexia nervosa: a hypnosuggestive framework. Contemporary Hypnosis 10(2): 73–80.

McConkey KM, Sheehan PW, White KD (1979) Comparison of the Creative Imagination Scale and the Harvard Group Scale of Hypnotic Susceptibility: Form A. International Journal of Clinical and Experimental Hypnosis 27(3): 265–77.

Morgan AH, Hilgard ER (1978–9) The Stanford Hypnotic Clinical Scale for Adults. American Journal of Clinical Hypnosis 21: 134–47.

Monteiro K, MacDonald H, Hilgard E (1980) Imagery, absorption, and hypnosis: a factorial study. Journal of Mental Imagery 4: 63–81.

Nash MR, Baker EL (1993) Hypnosis in the treatment of anorexia nervosa. In: JW Rhue, SJ Lynn, I Kirsch (eds) Handbook of Clinical Hypnosis. Washington, DC: American Psychological Association, 383–532.

Norman DA, Shallice T (1986) Attention to action: willed and automatic control of behavior. In: RJ Davidson, GE Schwartz, D Shapiro (eds) Consciousness and Self-regulation, Vol, 4. New York: Plenum, 1–18.

Oakley D, Frasquilho F (1998) Hypnotic susceptibility or F-bias: its relevance to eating disorders. Contemporary Hypnosis 15(1): 40–51.

Pekala RJ (1982) The Phenomenology of Consciousness Inventory. Thorndale, Pennsylvania: Psychophenomenological Concepts.

Pekala RJ (1991) Quantifying Consciousness: An Empirical Approach. New York: Plenum Press.

Pettinati HM, Horne RL, Staats JM (1985) Hypnotizability in patients with anorexia nervosa and bulimia. Archives of General Psychiatry 42(10): 1014–17.

Register PA, Kihlstrom JF (1986) Finding the hypnotic virtuoso. International Journal of Clinical and Experimental Hypnosis 34: 84–97.

Rhue JW, Lynn SJ, Sandberg D (1995) Dissociation, fantasy and imagination in childhood: a comparison of physically abused, sexually abused, and non-abused children. Contemporary Hypnosis 12(2): 131–6.

Santonastaso P, Favaro A, Olivotto MC, Friederici S (1997) Dissociative experiences and eating disorders in a female college sample. Psychopathology 30(3): 170–6.

Sapp M, Evanow M (1998) Hypnotizability: absorption and dissociation. Australian Journal of Clinical Hypnotherapy and Hypnosis 19(1): 5–7.

Shor RE, Orne EC (1962) Harvard Group Scale of Hypnotic Susceptibility: Form A. Palo Alto,

Published by John Wiley & Sons, Ltd

CA: Consulting Psychologists Press.
Stunkard A, Messick S (1985) The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. Journal of Psychosomatic Research 29(1): 71–83.
Thompson MA, Gray JJ (1995) Development and validation of a new body image assessment scale. Journal of Personality Assessment 64 (2): 258–69.
Vanderlinden J (1993) Dissociative Experiences, Trauma and Hypnosis: Research Findings and Clinical Applications in Eating Disorders. Delft: Eburon.
Vanderlinden J, Spinhoven P, Vandereycken W, Van Dyck R. (1995) Dissociative and hypnotic experiences in eating disorder patients: an exploratory study. American Journal of Clinical Hypnosis 38(2): 97–108.
Vanderlinden J, Van Dyck R, Vandereycken W, Vertommen H, Verkes RJ (1993) The Dissociation Questionnaire: development and characteristics of a new self-report questionnaire. Clinical Psychology and Psychotherapy 1: 21–7.
Vanderlinden J, Vandereycken W, Van Dyck R, Vertommen, H (1993) Dissociative experiences and trauma in eating disorders. International Journal of Eating Disorders 13(2): 187–93.
Weitzenhoffer AM, Hilgard ER (1962) Stanford Hypnotic Susceptibility Scale, Form C. Palo Alto, CA: Consulting Psychologists Press.
Williamson DA, Davis CJ, Bennett SM, Goreczny AJ, Gleaves DH (1989) Development of a simple procedure for assessing body image disturbances. Behavioral Assessment 11(4): 433–46.
Williamson DA, Davis CJ, Goreczny AJ, Blouin DC (1989) Body-image disturbances in bulimia nervosa: influences of actual body size. Journal of Abnormal Psychology 98(1): 97–9.
Williamson DA, Gleaves DH, Watkins PC (1993) Validation of self-ideal body size discrepancy as a measure of body dissatisfaction. Journal of Psychopathology & Behavioral Assessment 15(1): 57–68.
Wilson SC, Barber TX (1978, 1979) The Barber Suggestibility Scale and the Creative Imagination Scale: Experimental and Clinical Applications. American Journal of Clinical Hypnosis 21(2): 84–108.
Wilson SC, Barber TX (1979) The Creative Imagination Scale as a measure of hypnotic responsiveness: applications to experimental and clinical hypnosis. American Journal of Clinical Hypnosis 20(4): 235–49.
Wilson SC, Barber TX (1983) The fantasy-prone personality: implications for understanding imagery, hypnosis, and parapsychological phenomena. In: A A Sheikh (ed.) Imagery, Current Theory, Research and Application. New York: Wiley, 340–90.
Woody E, Bowers K (1994) A frontal assault on dissociated control. In: SJ Lynn, W Rhue (eds) Dissociation: Clinical and Theoretical Perspectives. New York: Guilford, 52–79.
Wybraniec A, Oakley D (1996) Dietary restraint, hypnotizability and body image. Contemporary Hypnosis 13(2): 150–5.

Address for correspondence:
Dr Kathryn Gow
School of Psychology and Counselling
Queensland University of Technology
L Block, Carseldine Campus
Beams Road
Carseldine Q 4034
Australia
Email: k.gow@qut.edu.au