

**DOCTORAL THESIS**

**PERSONAL CONSTRUCTS IN SECONDARY HYPOTHYROIDISM**

**Submitted in partial fulfilment of the requirements of the University of  
Hertfordshire for the degree of Doctor in Clinical Psychology**

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## PERSONAL CONSTRUCTS IN SECONDARY HYPOTHYROIDISM

### ABSTRACT

Secondary hypothyroidism is caused by treatment for hyperthyroidism and is a chronic condition. After adequate treatment, people can continue to experience persistent physical and depressive symptoms. There is a lack of research into the psychological factors involved in the condition, such as how people adjust to hypothyroidism. The study used Kelly's (1955) Personal Construct Theory to explore the way in which patients construe (appraise) themselves with hypothyroidism and how this relates to coping, depression and hypothyroid symptoms. Twenty participants were recruited from an endocrinology clinic and online, through thyroid support organisations. Participants completed a semi-structured interview called a repertory grid and self-report measures of coping (Brief COPE), depression (HADS) and hypothyroid symptoms (ThySRQ). Repertory grid measures were extracted such as distances between different views of the self. The results showed that how unfavourably the self now was viewed compared to self before a thyroid disorder was positively correlated with depression, dysfunctional coping and hypothyroid symptoms. Identification with a negative view of hypothyroidism was associated with poorer mental and physical health and with dysfunctional coping. Polarized (i.e. black-and-white) construing and tight (i.e. rigid) construing were significantly and positively related to depression scores. Tightness of construing was also related to the number of hypothyroid symptoms experienced. Dysfunctional coping was positively correlated with depression and hypothyroid symptoms. Those with a history of depression experienced significantly more hypothyroid symptoms. Exploratory multiple regression analyses uncovered that how unfavourably the person viewed themselves now compared with before any thyroid problem, hypothyroid symptom frequency and dysfunctional coping accounted for 82.9% of the variance in depression. This highlights the importance of understanding how people construe the experience of hypothyroidism and their coping strategies and therefore psychological interventions may be helpful. Limitations include a small sample size and a correlational design, whereby cause and effect conclusions cannot be drawn.

## **1. INTRODUCTION AND LITERATURE REVIEW**

### **1.1 Introduction to Thyroid Disorders**

Thyroid conditions affect one in 20 people in the UK population (British Thyroid Foundation, 2011). Thyroid hormone imbalances can lead to physical difficulties, affective conditions such as depression, and cognitive disturbances. These difficulties can persist after treatment.

Depression can similarly affect many people, described as the 'common cold' of psychiatric problems (Seligman, 1988). Depression is a psychological problem characterised by low mood, cognitive impairments such as decreased attention and memory, decreased behavioural functioning and physiological symptoms such as changes to sleep pattern and appetite, fatigue and aches and pains (National Institute for Mental Health, 2008). It is the fourth leading cause of disability-adjusted life years due to the physical, social and mental effects this can have on the individual (Ustun, Ayuso-Mateos, Chatterji, Mathers & Murray, 2004).

In order to understand the link between thyroid disorders and persistent physical symptoms and depression, this paper will first address the nature, function and effects of thyroid hormones on mental health. The affective sequelae of hyperfunctioning of the thyroid called hyperthyroidism will be considered, as will low thyroid function known as hypothyroidism. Following this, the influence of psychological factors on the adaptation to thyroid disorders will be considered in the context of other chronic health conditions. The paper will highlight the way patients perceive or construe their illness as a measure of adjustment and whether this relates to depression and physical symptoms of their thyroid disorder.

### **1.2 The Thyroid Gland**

The thyroid gland produces the hormones thyroxine (T4) and tri-iodothyronine (T3), which are important in controlling metabolism in the body. The thyroid is part of the neuroendocrine system and hypothalamic-pituitary-thyroid (HPT) axis and therefore thyroid hormones can influence many areas of the body. T4 needs to be converted to

T3 to work in the body's cells and organs (British Thyroid Association, BTA, 2007). The levels of these hormones are regulated by the secretion of thyroid stimulating hormone (TSH) from the pituitary gland and TSH secretion is regulated by thyrotropin-releasing hormone (TRH). If the levels of T4 are within the normal ranges, the person is said to be euthyroid. However, if a person has elevated or suppressed TSH levels with normal T4 levels, they may be described as having a subclinical thyroid disorder. Increased or decreased production of thyroid hormones has important consequences on all cells of the body, including the brain and as a result can affect mental health (Bauer, Goetz, Glenn & Whybrow, 2008).

### **1.3 Thyroid Overactivity (Hyperthyroidism)**

The thyroid gland can be affected by different disorders and environmental factors, which in turn affects thyroid production and distribution. Diseases such as those that cause antibodies to stimulate the thyroid gland (i.e. Graves' disease) or benign tumours can lead to excess production of T4 and T3. Overactivity of the thyroid gland is called hyperthyroidism. It is prevalent in 1% of the population and is 6 times more common in women (BTA, 2007). The likelihood of developing the condition increases over the age of 60 years (Tremont, Stern, Westervelt, Bishop & Davis, 2003). Physical symptoms of hyperthyroidism can include fatigue, heat intolerance, weight loss, shakiness, hyperactive behaviour, palpitations, agitation, poor sleep, nausea and increased frequency of defecation and cognitive problems (BTA, 2007). Studies have also found psychological problems associated with untreated hyperthyroidism, especially anxiety and depression (Bunevicius & Prange, 2006; Demet et al., 2002; Sonino et al., 2004). A prospective cohort study of 2269 middle aged men found that higher levels of thyroxine were associated with increased risk of depression (Williams et al., 2009). Quality of life is also significantly impaired in untreated hyperthyroid patients (Elberling et al., 2004).

#### *1.3.1 Stress and hyperthyroidism*

It is important to note that, as well as being sequelae of hyperthyroidism, anxiety and mental health symptoms have been commonly reported before the onset or diagnosis

of Graves' disease (Bunevicius, Velickiene & Prange, 2005; Stern et al., 1996), as have stressful life events and daily hassles (Kung, 1995). Lidz (1949) found frequent threatened or terminated interpersonal relationships immediately preceding the onset of hyperthyroidism. However, it is not clear whether these are precipitating or predisposing factors or whether hyperthyroidism may be undiagnosed at this time and influence the termination of these relationships (MacCrimmon, Wallace, Goldberg & Streiner, 1979).

Stress can impact the immune system through the hypothalamic-pituitary-adrenal and HPT axes (Biondi & Picardi, 1999). Thyroid hormones can directly stimulate immune cells (Marques-Deak, Cizza & Sternberg, 2005), leading to an increase in antibodies stimulating the thyroid gland, which can reinforce this cycle. Indeed, stressful life events have been correlated with thyroid antibodies (Bunevicius & Prange, 2006; Fukao et al., 2003) and in turn these antibodies involved in Graves' disease have been found to be related to depression and anxiety (Bunevicius et al., 2005). Therefore, unmanaged stress from life events could be hypothesised to lead to low mood before the onset of hyperthyroidism. Depression may then be reinforced through the impact of the thyroid hormones on mood.

There is often a delay of 3-6 months in gaining a diagnosis of hyperthyroidism (Stern et al., 1996) possibly as Graves' disease can be misdiagnosed as stress related due to the similarity of symptoms (Tremont et al., 2003). However, stress before the onset of hyperthyroidism may make accurate diagnosis difficult and cognitive symptoms, which can also occur in anxiety and depression, can further complicate the picture. Treatment can include antithyroid drugs to reduce the production of thyroid hormones; surgery to reduce the size of the thyroid; and radioactive iodine treatment (RAI) to destroy thyroid tissue. RAI is the most cost effective treatment for thyroid overactivity (BTA, 2007).

### *1.3.2 Outcome of treatment for hyperthyroidism*

Studies have found that the treatments discussed above have led to recovery of psychiatric disorders in hyperthyroidism (Trzepacz et al., 1988; MacCrimmon et al., 1979). Kathol, Turner and Delahunt (1986) found that all hyperthyroid patients with

depression at the start of the study no longer met the diagnostic criteria for major depressive disorder at the 30 week post treatment assessment. However, this was a small sample size (n=9) and they excluded one patient who developed depression at 3 months post treatment.

However, there is some evidence that symptoms, including psychological symptoms, can persist after the person is euthyroid. For example, Bunevicius et al. (2005) conducted a study comparing women with hyperthyroidism and ophthalmological problems with women with gynaecological problems and found that hyperthyroid patients had significantly greater prevalence of depression and anxiety disorders. Seventy five percent of the euthyroid (treated hyperthyroid) subgroup had mood or anxiety disorders. However, this was a small group (n = 16) and it may be that the impact of ophthalmological problems was a confounding factor. Stern et al. (1996) conducted a large scale survey of 137 treated Graves' disease patients and found that respondents reported better current functioning than when they were hyperthyroid but this was significantly worse than pre-morbid functioning. However, this paper only focused on persistent cognitive complaints rather than psychological problems. Fahrenfort, Wilterdink & van der Veen (2000) also conducted a large scale survey of treated hyperthyroid patients. The authors found that euthyroid respondents continued to experience hyperthyroid complaints including emotional difficulties, albeit fewer than hyperthyroid patients. Over a third of the patients could not resume the same work after treatment.

Some of the mechanisms which have been proposed for persistent depression in treated hyperthyroidism suggest that prolonged hyperthyroidism may exhaust the neuroadrenergic system and that the autoimmunity involved in Graves' disease may persist after treatment (Bunevicius & Prange, 2006). Continuing to experience symptoms may be stressful, which may interact with the autoimmunity leading to ongoing depressive symptoms. However, psychosocial factors such as the loss of interpersonal relationships which may have preceded the onset of hyperthyroidism may be an ongoing source of stress and may also mean that the individual has less social support to cope with the health condition. Post (1992) suggests that prior depression may sensitise a person to later episodes of depression and Coyne, Pepper and Flynn (1999) highlight that a history of depression is the single biggest predictor of current depression.

A proportion of hyperthyroid patients treated with RAI develop underactivity of the thyroid gland called secondary hypothyroidism. This means that further physical and emotional symptoms may be experienced.

#### **1.4 Secondary Hypothyroidism**

As there is less thyroid tissue following RAI treatment, patients should be monitored for thyroid underactivity (hypothyroidism) and treated quickly with thyroid replacement hormone (TRH) if this occurs (BTA, 2007). Seven to 20% of patients develop secondary hypothyroidism following RAI treatment and the cumulative incidence rises to 72% within 24 years (Lundell & Holm, 1980). Hypothyroidism is more commonly caused by an autoimmune process which destroys thyroid tissue (primary hypothyroidism).

Once a person becomes hypothyroid, it is a lifelong chronic condition (McMillan, Bradley, Razvi & Weaver, 2008). Hypothyroidism occurs when too little T3 and T4 are secreted, which causes the body's metabolism to slow down. The physical symptoms include fatigue and lethargy, cold sensitivity, impaired concentration and memory and increased weight (BTA, 2007). Hypothyroidism is associated with a high psychiatric morbidity, in particular depression (Aslan et al., 2005; Whybrow, Prange & Treadway, 1969) and paranoia (Jain, 1972). However, cognitive difficulties such as memory impairment and difficulty concentrating are also common (Whybrow, 1995). Possible mechanisms for the link with mental health problems include the hypothesis that TRH is a neurotransmitter with properties of an antidepressant (Marangell & Callahan, 1998). Cleare, McGregor & O'Keane (1995) suggested that hypothyroidism is related to reduced serotonin activity in the brain. This can lead to complex changes in the hypothalamic-pituitary-thyroid (HPT) axis which may compensate for the reduced serotonin activity (Duval et al., 1999).

#### *1.4.1 Treatment for hypothyroidism and persistence of symptoms*

The treatment for hypothyroidism is synthetic T4 and annual blood tests are necessary to monitor T4 levels (BTA, 2007). A number of people still experience physical, psychological and cognitive symptoms of hypothyroidism when on the recommended replacement dosage (Bunevicius & Prange, 2006; Fava, Sonino & Morphy, 1993; Kaplan, Sarne & Schneider, 2003; Tremont et al. 2003). Saravanan et al. (2002) found that 48.6% of 397 patients with recent normal thyroid test showed significant psychological impairment. However, Ladenson (2002) highlights that many of the patients in the study have a history of depression. Panicker et al. (2009) compared people on T4 with those not on T4 in a large community study of people aged over 40 years. The results showed that there was a higher prevalence of depression and anxiety in females on T4 than those without a thyroid disease. It has also been found that quality of life is impaired in the long term in those with hypothyroidism (McMillan et al., 2008; Ladenson, 2002). These studies used both primary and secondary hypothyroid patients.

It has been suggested that a possible reason for persistent psychological impairment may be due to the type of treatment. Tremont et al. (2003) and Williams et al. (2009) suggest that treatment with T4 alone without treatment with T3 produces 'peripheral euthyroidism', which may mean that the brain is not euthyroid. However, there have been contradictory findings on whether treating with T4 and T3 improves psychological well-being (Bunevicius et al., 1999; Siegmund et al., 2004).

There have been reports that patients can often become frustrated with doctors using only measures of thyroid function to judge whether the patient feels well, when patients are more likely to focus on the impact of the condition on their quality of life (Watt et al., 2007). This was highlighted in two qualitative studies. Turner (2006) conducted semi-structured interviews with hypothyroid women and found that participants reported that primary care physicians were often less knowledgeable and understanding of their difficulties with the illness. Similarly, Milliken and Northcott (1996) studied hypothyroid women's experience of seeking validation of their illness and that it can take time for all parties to recognise and understand the vague symptoms of hypothyroidism. Participants reported that they were not told about recurring symptoms and that blood test results took precedence over the patients'

account of their symptoms. It appears that patients feel they need more support for their condition.

There may be several reasons why depression may continue to be a problem for people with treated hypothyroidism, which will now be discussed.

#### *1.4.2 Mechanisms for relationship between treated hypothyroidism and depression*

##### *1.4.2.1 Biological mechanisms*

Depression is common in medical conditions per se and the prevalence can vary from 2-14% depending on the setting (Katon, 1996). Some of the biological mechanisms for the relationship between depression and health problems have been posited by researchers and include the direct physiological links between depression and health, through the altered autonomic system (Veith et al., 1994). It has also been suggested that small changes in thyroid hormones may account for some of the persistent depressive symptoms in hypothyroid patients. Jackson (1998) suggested that the majority of depressed patients may have slightly raised TSH levels although they would be classed as euthyroid (subclinical hypothyroidism). However, a history of depression before a thyroid disorder or during hyperthyroidism may be an important predictor of current depression (Coyne et al., 1999).

##### *1.4.2.2 Psychosocial and psychological factors*

In addition to biological mechanisms, there are a number of psychosocial factors which may also impact the relationship between treated hypothyroidism and depression. Stansfeld and Rasul (2006) highlight age, marital status, gender, social support, ethnicity and employment as important factors in depression and chronic illness. Factors such as alcohol use, social economic status and smoking have been suggested to impact the relationship between T4 and psychiatric problems (Williams et al., 2009). Kritz-Silverstein, Schultz, Palinkas, Wingard and Barrett-Connor (2009) found that thyroid hormones affected men differently from women in that TSH levels were inversely associated with depression in men and not women. Positive social

relationships were exceptionally important to the female patients in Turner's (2006) qualitative study and she suggested that this may have buffered the effect of mood and well-being. The author also reported a slight difference between the younger women (23-40 years old) and the older women (43-60 years old), where the older women reported a better quality of life. Turner suggested that this may be because these women have a higher degree of satisfaction in the important areas of their life. Therefore age of the patient may affect the impact of hypothyroidism on the patient's life. However, this study was qualitative and therefore statistical differences between ages could not be established. Individual psychological factors such as personality traits may also affect the relationship between hypothyroidism and depression. Frey et al. (2007) found that neuroticism, which is a marker for vulnerability to depression, was related to levels of thyroid hormones. However, the study was carried out with a sample of healthy volunteers rather than those with hypothyroidism.

#### *1.4.2.3. Perceptions of illness and symptoms*

McMillan et al. (2008) found that those with treated hypothyroidism who were euthyroid tended towards a more negative perceived impact of hypothyroidism on quality of life than those with subclinical hypothyroidism. It may be that treated patients had more severe symptoms in the past which still affect their perception of the condition. It may also be that biological mechanisms, such as peripheral euthyroidism, may be leading to persistent symptoms, which impact negatively on quality of life. The length of time with a treated thyroid disorder may also impact on the perception of symptoms as Engum et al. (2002) found that those with a known thyroid problem reported more symptoms of depression than those who were newly diagnosed or the general population. However, Panicker et al. (2009) suggested that patients with known hypothyroidism may be more aware of symptoms and depression may reduce the ability to tolerate these and patients therefore seek medical attention. Indeed, biased attention to bodily sensations has been found in people high in negative affectivity (Stegen, Van Diest, Van de Woestijne & Van den Bergh, 2001). However, in this study negativity was induced in students rather than a clinical population of those with depression or with a physical illness. In a study of a clinical population, Hou et al. (2008) found that patients with chronic fatigue syndrome (CFS) were more likely to attend to health-threat words than control words when they were

presented as pairs. Attentional bias to health information has been found in other chronic illnesses (Katon, Lin and Kroenke, 2007). These patients may then perceive themselves as ill and seek medical advice, leading to higher healthcare costs (Katon et al., 1990).

#### *1.4.2.4 Behaviour and Functioning*

Depression has been shown to have an impact on behaviour and functioning in chronic health problems, such as medication compliance. For example, patients with coronary artery disease who were depressed were less likely to take their medication compared to those patients without depression (Carney et al. 1995). Panicker et al. (2009) suggested that this mechanism may be a factor in patients with hypothyroidism, which may lead to worsening symptoms of hypothyroidism. However, medication compliance has not been researched in thyroid problems.

Both depression and hypothyroid symptoms may interfere with behaviour and functioning, which may reinforce depressive symptoms (Hays, Wells, Sherbourne, Rogers & Spritzer, 1995). Williamson (1998) found that restricted activity in those with chronic illness or injury accounted for significant amount of the variance in depressed affect after controlling for illness severity and psychosocial factors such as age, personality, social economic status and social support. However, it is important to note that the amount of variance accounted for by restricted activity was as small as 6% or 14% in some of the illnesses studied. Therefore, other variables must be considered.

#### *1.4.2.5 Stress and secondary hypothyroidism*

Stress has been found to impact on thyroid hormone levels. In a study of refugees who had undergone high levels of stress, Bauer, Priebe, Kurten, Graf and Baumgartner (1994) found that participants had reduced concentrations of thyroid hormones within the hypothyroid range, and that this was not related to psychiatric illness or severity of the stressor. Stress can impact the hypothalamic-pituitary-adrenal axis and HPT axis, leading to other changes in the body, which may increase

the risk for depression and physical illness (Kiecolt-Glaser, McGuire, Robles & Glaser, 2002). Experiencing a chronic health condition, such as a thyroid disorder, in itself can be stressful, leading to low mood. Consequently, it is important to consider how a person copes with stress is an important factor in adjusting to hypothyroidism. As Wells et al. (1989) highlight, depression may act as an additive effect to the burden of coping with a medical problem and indeed Milliken and Northcott's (1996) participants reported that the psychological difficulties of hypothyroidism were more upsetting than the physical symptoms. Therefore further research is needed into the psychological difficulties associated with hypothyroidism.

### **1.5 Criticisms of research**

Much of the literature regarding depression in health conditions consists of case control and small cross sectional studies, which makes it difficult to identify whether depression is a predictor or indicator of adjustment to the health problem (Sharpe & Curran, 2006). As Reus (1986) highlights, endocrine conditions may be caused, or exacerbated, by contextual factors in the person's life such as psychological problems, and psychiatric disorders may originate and be affected by neuro-endocrine disturbances. Katon et al. (2007) emphasize that depression is related to somatic symptoms, which makes it difficult to separate the medical condition symptoms from a psychological problem. The way in which depression is measured within the studies varies, which makes it difficult to compare a study that uses a diagnosis of depression and one that uses self report measures.

### **1.6 Summary of thyroid condition literature**

In summary, there are reports that individuals can experience persistent physical and depressive symptoms in hyperthyroidism and hypothyroidism. These symptoms may lead to impaired functioning and quality of life and in turn lead to higher health care costs. Understanding of the psychological factors which may influence the relationship between a thyroid condition and depression appears to be lacking (McMillan et al., 2008; Sonino, Tomba & Fava, 2007). Sonino et al. (2007) suggest that some aspects of chronic endocrine disorders may be irreversible, which may lead

to a personal set of responses based on the individual's resources and deficits. However, it is important to remember that not all patients with thyroid disorders develop depression. The discussion will now focus on individual variables in chronic illness, including the individual's meaning making and coping as ways of adjusting to the problem.

## **1.7 Adjustment in chronic health problems**

Sharpe and Curran (2006) define adjustment to illness as 'the process to maintain a positive view of self and the world in view of a health problem' (p. 1161). Stanton, Collins and Sworowski (2001) conceptualise adjustment as mastery of disease related adaptive tasks, adequate functioning, low negative affect, lack of psychological disorder and an adequate quality of life. Coping and appraisals have been hypothesised to affect adjustment in chronic illness.

### *1.7.1 Coping with chronic illness*

There has been a large amount of research into how people cope with physical illness and whether this acts as a determinant of adjustment and depression (de Ridder, Greenan, Kuijer & van Middendorp, 2008). Coping has been defined by Lazarus and Folkman (1984) as the way a person attempts to manage the difficulties created by stressful events that are perceived as surpassing a person's resources. Lazarus and Folkman (1984) highlight two sets of appraisal processes when someone encounters a situation: primary appraisal, which is the assessment of the degree of threat and challenge; and secondary appraisal, which is what the person thinks they can do about this threat with their resources. These appraisals are thought to affect choice of coping strategy.

### *1.7.2. Theories of coping*

The most prominent theory of coping was put forward by Lazarus and Folkman (1984), which distinguished problem-focused coping (where an individual attempts to do something about the stressor) and emotion-focused coping (where an individual

tries to reduce the emotional aspects of the stressor). However, these categories are too simplistic (Carver, Schier & Weintraub, 1989) and often they are interrelated (Lazarus, 2006 in Carver & Connor-Smith, 2010). Other classifications of coping include approach coping (active attempts to change or get rid of the stressor) or avoidance coping (passive styles which include strategies such as withdrawal or denial) (Suls & Fletcher, 1985). Generally, active problem focused coping strategies have been highlighted as a helpful style of coping for adaptation to physical health problems (Maes, Leventhal & de Ridder, 1996; Stanton et al., 2001) and avoidance styles of coping in relation to physical health have been associated with poorer outcomes (Taylor and Stanton, 2007).

### *1.7.3 Coping with fatigue*

Although there is a dearth of research in coping with thyroid disorders, it may be possible to use studies exploring coping in chronic fatigue syndrome (CFS) as the complaint of fatigue is also common in hypothyroidism. However, it must be remembered that these conditions have different underlying biological mechanisms and illness courses. Research has shown that CFS patients are more likely to use more avoidant styles of coping than chronic pain patients and healthy controls (Blakely et al. (1991). Afari et al. (2000) conducted a study exploring coping in individuals with chronic fatigue and CFS, matched with their non-fatigued twin. The authors used three increasingly stringent definitions of chronic fatigue including a category for individuals who had felt fatigued for at least 6 months; therefore hypothyroid patients with persistent tiredness could fall in this category. It was found that the fatigued twin used less problem-focused strategies and more avoidance strategies to cope with stress than the non-fatigued twin. The style of coping has also been shown to be related to functional impairment. Ray, Jefferies and Weir (1995) found that maintaining activity, which they suggested could be viewed as an active style of coping, was negatively correlated with functional impairment. However, active coping as measured on the COPE (Carver, Schier & Weintraub, 1989) was not related to functional impairment. Consequently, continued activity may be a specific coping strategy which is important in CFS. In line with the research evidence that avoidance styles of coping are related to worse outcomes, Ray et al. (1995) found that behavioural disengagement was positively related to fatigue, functional

impairment, anxiety and depression in CFS. However, the authors did not include emotion-focused coping scales within the analysis, which may mean that important information about types of coping in chronic fatigue may have been missed.

Only one study could be found that measured coping in thyroid disorders. Yoshiuchi, et al. (1998) explored the association between the outcome of treatment for Graves' disease and a number of factors including coping skills. These skills were grouped into problem-focused, emotion-centred and waiting-for-time-to-pass coping. The latter category was described as waiting for distress to disappear spontaneously. Patients were divided into three groups after 12 months of antithyroid drugs: those who had become euthyroid; those who were hypothyroid and those who were still hyperthyroid. No associations were found between thyroid disorder status and type of coping skills at 6 or 12 month follow-up although daily hassles were positively associated with hyperthyroid status in women at the follow-up assessment. However, the paper did not provide details of the individual items of the questionnaire and it is not clear if the 'waiting for time to pass' category is a theoretically derived construct. This questionnaire may have missed more dysfunctional styles of coping such as denial and avoidance.

All the participants in Turner's (2006) qualitative study reported efforts towards self care such as completing exercise, eating healthily and participating in favoured activities. This could be conceptualised as active planning. Younger women (25 to 40 years of age) also reported more spirituality and caring about valued others. Using Carver et al.'s (1989) proposed dimensions of coping, these strategies could be conceptualised as emotion-focused. There may also be a difference in the coping strategies used dependent on the age of the participant, although this relationship could not be tested empirically in this study.

#### *1.7.4 Criticisms of the coping literature*

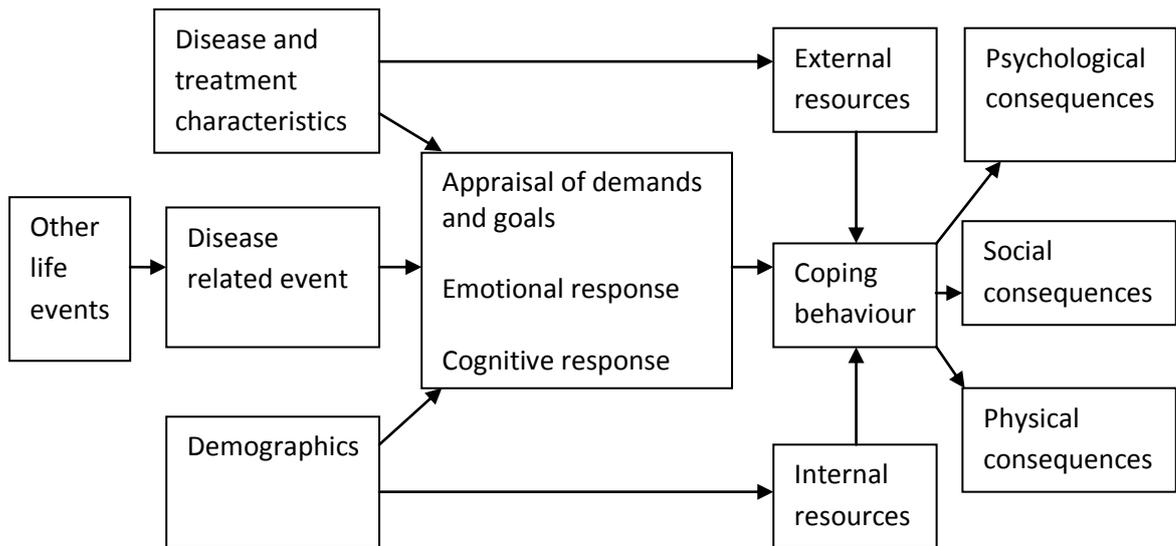
Schwarzer and Schwarzer (1996) highlight methodological problems in distinguishing helpful and unhelpful styles of coping. These include the difficulties in measuring whether coping strategies change over time and in different contexts. However, viewing active styles of coping as always helpful and avoidance coping as unhelpful

does not allow for differences within the illness and the situational factors that are involved. For example, it was found that avoidance styles of coping can be helpful in temporary and uncontrollable situations (Suls and Fletcher, 1985) and problem focused coping is only helpful if there are aspects amenable to change (Park, Folkman & Bostrom, 2001). The specific changes within an illness for each person may also mean that usual coping styles are no longer suitable (de Ridder et al., 2008) and therefore the individual person's journey is important to consider (Ettore, 2006).

#### *1.7.5 Factors affecting coping*

It has been suggested that choice of coping strategies is also dependent on individual personal factors such as personality traits. Extraversion, conscientiousness and openness traits relate to perceiving a stressful incident as a challenge rather than a danger (Penley and Tomaka, 2002), which can then lead to the use of engagement coping (Connor-Smith and Flachsbart, 2007). However, Connor-Smith and Flachsbart (2007) suggest that relationships between coping and personality traits are modest. Therefore, other variables may be influencing this relationship. Taylor and Stanton (2007) suggest that there are other individual factors which mediate coping including a sense of mastery over the stressor, optimism, high self esteem, social support and the individual's cognitive appraisals of the stressful event.

Maes et al. (1996) proposed a model to include a number of variables related to coping and adjustment in chronic illness. This included demographic details such as age, gender; the external resources such as social support, and life events; and appraisals of the illness as shown in Figure 1.



**Figure 1. Model of coping with chronic illness (Maes et al., 1996, p 229)**

The model shows that coping may be a mediator between cognitive appraisals of the illness and adjustment to the illness. Therefore, the chapter will now focus on the individual's cognitive appraisals and perceptions of chronic illness

### 1.7.6 Cognitive appraisals

As shown in the above model, appraisals of the disease are a factor affecting coping in chronic illness. There is little research looking at how people appraise or make sense of their thyroid condition but conditions that may have similar symptoms will be discussed to make predictions of how the person might appraise having secondary hypothyroidism. The different theories relating to cognitive appraisals in physical health conditions will be discussed.

#### 1.7.6.1 Causal attributions

Roesch and Weiner (2001) conceptualise cognitive appraisals as causal attributions. In a meta-analysis of a wide variety of health related problems, the authors found that individuals whose causal attributions of their illness were related to internal, unstable, and controllable factors used more approach forms of coping. This indirectly led to better adjustment as opposed to individuals who had stable and uncontrollable causal

attributions of their illness, who were more likely to use avoidance coping and had difficulties with adjustment. However, the authors note that attributions account for a small amount of variance in coping and adjustment. Milliken and Northcott (1996) highlight that the common initial meanings hypothyroid patients attributed to symptoms were that they thought that they were overtired, sick, stressed or lazy, which may be seen as internal, unstable and to some extent controllable. Conversely, these attributes led to undermining their self esteem and attempts to address these did not lead to relief of symptoms. However, it appeared that most of the participants had primary hypothyroidism whereas in secondary hypothyroidism, the cause may be attributed to external factors e.g. RAI treatment.

#### *1.7.6.2 Illness representations*

Illness representations are another way of conceptualising cognitive appraisals (Leventhal, Meyer & Nerenz, 1980). These representations are beliefs about the cause, identity, time-line, consequences and control of an illness derived from personal experience of the illness, information from medical systems and cultural perspectives. However, unlike causal attributions, representations can operate either cognitively or emotionally. Moss-Morris, Petrie and Weinman (1996) studied illness representations in CFS and found that patients believed their illness had a strong identity, that the illness had serious consequences in their lives and was a long term problem. These representations accounted for 37% of the variance in psychological adjustment and therefore appear to be an important aspect to consider. Illness representations have also been found to influence a person's reaction to the progression and variability in rheumatoid arthritis and multiple sclerosis (Schiaffino, Shawaryn and Blum, 1998). Therefore, these specific aspects of an illness may be important for assessing how someone views the change in thyroid status after RAI treatment.

Only one study was found which examined perceptions in hypothyroidism. Dickson, Toft and Carroll (2009) used a group of patients with treated primary hypothyroidism as a comparison group for CFS patients. The study found that the hypothyroid patients believed that their condition was long-term, but they had greater control over and were less concerned about their condition than the CFS group. These

perceptions were not accounted for by mood, indicating that how the patient viewed their illness may have important consequences for adjustment. These results could be different for patients with secondary hypothyroidism, as the experience of change in thyroid status from hyperthyroid to hypothyroid could affect how much control they perceive to have about their condition. Representations concerning identity were not reported by Dickson et al. (2009) but identity of the illness was found to be important in a study of illness representations in another endocrine disorder, Addison's disease (Heijmans, 1999). In Addison's disease, the adrenal glands do not produce enough of the hormones cortisol and aldosterone, which can lead to fatigue, low mood and weight loss. Heijmans (1999) found that a strong illness identity, a more chronic time line perception, less perception of control and a view that there are significant consequences all correlated positively with cognitive avoidant coping. Illness representations were a stronger predictor of outcome than coping. However, Addison's disease is rare and this may be why there is a strong identity belief attached to it.

Hagger and Orbell (2003) conducted a meta-analysis of 45 studies of physical health problems and found that strong illness identity was related to avoidance coping and expression of feelings; perception of control was related to problem focused coping and reappraisal of the problem; and perceiving the illness as having many symptoms, being serious and long term was associated with avoidance and expression of emotion focused coping styles. Poorer psychological well-being was related to viewing the illness as being serious, long-term and having a strong identity. Sharpe, Sensky and Allard (2001) conducted a prospective study with patients suffering with rheumatoid arthritis, which found that illness representations are related causally to the development of depression. However, depression has been found to impact perceptions of health, social status and performance activities. Wells et al. (1989) reported that patients with major depressive disorder perceived their health as poorer and perceived their social and vocational activities as more limited compared with patients with chronic medical conditions. Beck (1975) highlights the negative cognitive bias towards the self, others and the world when someone is depressed. Therefore, illness perceptions may predict depression and depression may impact the view of the illness.

Although most models assume that the more negative the belief about the illness the more likely the person is to experience a psychological disorder, there have been exceptions. The goodness-of-fit hypothesis (Park et al, 2001) suggests that maladaptive outcomes occur when reality and the belief do not match. This incorporates the context of the illness into the person's belief system. Therefore, people who believe they have control over their illness (internal locus of control) when the condition is very serious and out of their control may experience depression (Christensen, Turner, Smith, Holman and Gregory, 1991).

#### *1.7.6.3. Post-traumatic growth and benefit finding*

Finding meaning is important in relation to chronic disease and is related to how a person perceives or appraises their condition. In relation to trauma, Janoff-Bulman and Frantz (1997) suggest that meaning relates to whether an individual can make sense of an event and the importance of the experience to the individual. This can create an opportunity for creating meaning in life, such as using the opportunity to strengthen important relationships. Sprangers and Swartz (1999) also discussed that when people are confronted with ill health, they have the opportunity to amend their values and beliefs about what is important to them. This means that people can maintain an acceptable level of quality of life. They called this the 'response shift' phenomenon. However, benefit finding does not always result in positive outcomes. Tomich and Helgeson (2004a) found that women with advanced breast cancer who tried to find benefits in their illness had greater distress. This may be employed as a way of ignoring important information. However, Affleck and Tennen's (1996) review highlights that much of the research is cross sectional, and so a causal relationship cannot be established as improved quality of life and less psychological distress may reduce the bias towards negative information and more benefits will be found.

#### *1.7.7 Illness and self identity*

The loss of a self identity is important to consider in chronic illness in relation to adjustment (Charmaz, 1993). Asbring (2001) studied women with CFS and fibromyalgia and suggested that chronic illness may be perceived as a disruption in

the biography of a patient's life and lead to the construction of identity transformations. Leventhal, Leventhal and Cameron (2001) explored the perceived relationship between disease and the self. They suggested that the relationship may be viewed as either 'total', when the self and disease are merged together; 'encapsulated', where only parts of the self are seen as diseased; or 'at risk', where the self faces danger from the disease. They discuss that when the individual has a well-differentiated self system, they are able to recognise that the chronic disease may restrain their activities and life goals, but that the daily life is for the most part unaffected. Adams, Pill and Jones (1997) found that patients, who accepted that they were asthma sufferers, and therefore this was part of their identity, were clearer in their need to take medication. Therefore, seeing the illness as part of an identity could be helpful. However, if this condition is also seen as having serious, possibly negative aspects, accepting the condition as part of the identity could lead to lower mood.

In summary, there is a gap in the literature on how people with secondary hypothyroidism may appraise and make sense of their illness. Given the research with other chronic health disorders, it may be that these appraisals could be related to depression and coping strategies. Further understanding of how a person views him or herself with hypothyroidism could be gained by using a Personal Construct Theory approach.

### **1.8 Personal Construct Theory (PCT; Kelly, 1955)**

The fundamental assumption of PCT is that we continually try to anticipate events in the world based on our previous experiences (Kelly, 1955). Each person has individual constructs, which form hypotheses that are continually revised based on how the person makes sense of an event (constructive alternativism), such as having a chronic illness.

Kelly (1955) put forward 11 corollaries which concern 1. Construction (our attempt to find repeated patterns in our lives) 2. Individuality (each person constructs or make sense of the world differently) 3. Organisation (there are relationships between constructs and these are organised in a hierarchical system) 4. Dichotomy (the

construct system is made up of bipolar constructs to find similarities and differences in our experiences) 5. Choice (people will choose the construct pole which best helps them to expand their system) 6. Range (constructs may be applicable to a limited range of events) 7. Experience (constructs may be validated or invalidated when confronted with an event and therefore the system may change as a result) 8. Modulation (constructs may be permeable which allows new events to be incorporated into the system) 9. Fragmentation (there may be subsystems of constructs which may not be compatible) 10. Commonality (groups or cultures of people may use similar constructs to view the world) and finally 11. Sociality (being able to make sense of the way in which another person may anticipate an event will help the person to relate to them). The main assessment tool of PCT will be briefly presented and relevant aspects of the theory will be discussed in relation to psychological and physical health problems.

### **1.9 Repertory grids**

One of the tools Kelly developed to examine an individual's predictions about the world is the repertory grid technique. It is an assessment measure that can provide details about an individual's construct system. It has been used in approximately 90% of PCT research studies (Walker & Winter, 2007). Grids consist of constructs and elements, which can be different themes such as events, people or the self. Combinations of elements are compared for distinctions and bipolar constructs are elicited. Constructs become a bipolar scale on which elements can be rated. This allows the data to be quantified and mathematical analyses can be conducted. The assumption is that constructs are statistically and hierarchically related as are elements. Those constructs or elements higher on the hierarchy are said to be superordinate and more salient for the person (Fransella, Bell & Bannister, 2004). Fransella et al. (2004) highlight the reliability and validity of repertory grids in providing a measure of the way a person construes. Repertory grids have been used to investigate a variety of psychological problems (see Walker & Winter, 2007 for a review).

## **1.10 Psychological disorders and PCT**

Within PCT, psychological difficulties are viewed as an individual being unable to alter their constructions when there has been invalidation (Winter, 1992). For instance, Kelly (1955) described depression as a constriction of the person's perceptions in order to avoid invalidation of the core self construction and Bannister and Fransella (1980) suggest that emotions are a sign of change in the construct system. Kelly (1955) described transition constructs, which look at change within the construct system that might occur when we construe an event and may help explain some of the psychological difficulties associated with adjustment. Those transition constructs which seem most relevant to adjusting to a chronic illness are threat, anxiety and guilt.

### *1.10.1 Constructs of transition*

In PCT, 'threat' occurs when a person's core constructs about themselves and the world are called into question. Within a thyroid condition, there may be core constructs related to the self being seen as 'slim'. Developing hypothyroidism might threaten this view, and weight gain as part of the condition might lead to negative self-construing. O'Malley, Hickey and Nevens (2000) found that 39% of hypothyroid patients surveyed believed that weight gain contributed to their low mood. This could suggest that the change in their weight has led to a negative view of the self. 'Anxiety' is thought to occur when an experience is encountered which a person's construct system is unprepared for. During the period where patients were hyperthyroid, this could have included attending a radiology department for treatment. Both anxiety and threat may be difficult for the person to deal with and Dalton and Dunnet (1992) suggest as a result the individual may avoid this by narrowing their view of the experience. As a result, this narrowing would lead to tighter construing. Dalton and Dunnet (1990) describe someone who uses tight construing as holding steadfast views, which result in a rigid view of life and allow the individual to make the same predictions time and time again. The opposite of this would be someone using loose construing, who changes their view of the world quickly and frequently. Dalton and Dunnet (1990) suggest that if the extreme of either position is held, this could cause difficulties for the person. The flexibility of constructs is important as this allows

for new information to be incorporated into an individual's construct system, which could help with adjustment to unknown events. Button (1983b) suggests that a person may hold on to parts of the system which can provide any certainty. This may mean that the role of being ill provides self validation, structure and predictability (Winter, 1983, 1992). Fransella (1972) found that for stutterers, the symptom of stuttering became a way of life and that they found it difficult to elaborate or expand the view of themselves as non-stutters. Therefore, the symptoms of having hypothyroidism, whilst undesirable, may provide some level of predictability in the world as patients may be less able to elaborate a self without the effect of symptoms. Button (1983a) found that tighter construing was related to poorer prognosis in anorexics. Therefore, tightness of construing may be related to how much the person can adjust to a new event, such as developing hypothyroidism. Kelly's (1955) transition construct 'guilt' may also be an important concept in adjusting to hypothyroidism. In PCT, guilt occurs when a person believes that they are not interacting with others in ways that are important to them (Kelly, 1955). For example, an individual may have a core construct of 'being sociable'. However, the symptoms of fatigue may lead to missing social events, which may dislodge the person from a core role of 'being social'. This could lead to a loss of an authentic self.

### *1.10.2 Structure of construct system in psychological disorders*

Repertory grids can be analysed to uncover the structure of a construct system, including the tightness of construing. Various computer packages have been designed to obtain specific data. One of the main analyses includes a principal component analysis (PCA), the variance accounted for by the first component from which is seen as measure of cognitive simplicity, or tightness, of the grid (Bieri, 1955). Therefore, the higher the percentage, the more the constructs are related around the same focus (monolithic construing).

Sheehan (1981) compared a group of patients with depression to a matched group of non-depressed individuals. It was found that the depressed group had more tightly organised construct systems than the control group. However, the group sizes were small (n=16), which may have biased the results. Feixas, Erazo-Cacedo, Lewis-Harter and Bach (2008) studied unipolar depression in a much larger sample and

failed to find more monolithic construing in depressive disorders. However, the sample was heterogeneous and included other psychological difficulties such as personality disorder.

In addition to the tightness of the construct system, another feature of the construct system is the polarization of the construing (i.e. the tendency to use the extremes of the construct). Depression is also characterised by extreme (polarized) construing (Neimeyer, 1985d), which can be compared to black and white thinking (Beck et al., 1979). Neimeyer, Klein, Gurman and Griest (1983) found that symptom severity correlated with this tendency to construe in this dichotomous way. Dingeman, Space and Cromwell (1983) also found that this style of construing discriminated between people with schizophrenia and a control group with mental health difficulties. Polarization may be likely in secondary hypothyroidism as these patients have experienced extremes of symptoms such as weight gain/weight loss, hyperactivity/lethargy which could affect whether they have extreme views of the self.

The percentage sum of squares that they account for in a repertory grid indicates the superordinancy of constructs and salience of elements (Bannister & Salmon, 1967; cited in Winter, 1992). Therefore, a salient element related to the self may be considered to be an important identity in the person's construct system. Rosenberg and Gara (1985) hypothesised that disruption of the superordinate identities would threaten an individual's sense of continuity. It was suggested that individuals may move, possibly for a temporary period, to another superordinate identity if one is threatened. This would allow the person to maintain an elaborated sense of self. However, if an individual has only one main identity, then disturbance to this identity would be a strong threat to the person's sense of reality. Therefore different aspects of the self should be considered.

### *1.10.3 Constructions of self in psychological disorders*

The distances between elements can also be computed from repertory grids. Neimeyer (1985d) highlights that individuals with depression have negative or ambivalent self constructions, which can be studied by comparing a self element with a positive element such as an 'ideal self'. Feixas et al. (2008) looked at how the

person construes the self and others when suffering with depression. They found that depressed individuals viewed their current self as different from their 'ideal self' i.e a negative self construal, indicating low self esteem (Moretti and Higgins, 1990). Larger distances were also seen between self and others (indicating perceived social isolation) and others and ideal self (indicating a negative evaluation of others) (Feixas et al., 2008).

#### *1.10.4 Inconsistencies in the construct system in psychological disorders*

In line with Kelly's fragmentation corollary, parts of the construct system may not be logically linked and may allow for inconsistencies. Feixas and Saul (2004) and Feixas, Saul and Avila-Espada (2009) discuss cognitive conflicts that can also be related to mental health difficulties. Their research has looked at whether changes in undesirable self-constructions would be resisted as they may mean a threat to personal identity and imply changes in areas of their construct system which the person is happy with. For example, someone with an underactive thyroid may have the construct pole 'energetic' as the opposite of 'tired'. However, becoming energetic might be related to becoming 'irritable' (as their experience may have been when they were hyperthyroid). Therefore, it may be easier to experience the symptoms as this provides a predictable way of viewing the world and does not lead to change in an area in which they are happy. They found that these conflicts, termed implicative dilemmas, appeared in 52.4% of psychotherapy patients (Feixas & Saul, 2003 in Feixas and Saul, 2004) and that the clinical group had almost twice the number of implicative dilemmas as the control group. Feixas et al. (2009) found that participants with implicative dilemmas had higher levels of symptom severity. Feixas, Montebruno, Dada, de Castillo and Compan (2010) found that 71.9% of bulimic participants had implicative dilemmas compared with 18.8% of non-clinical groups and that the presence of implicative dilemmas, lower self esteem and high polarization (extreme view of the self) seem to distinguish bulimic participants from non-clinical participants.

Conflict and inconsistencies in how an individual views him or herself and others may also be important in psychological difficulties. Bell (2004a) studied the relationship between an element and two constructs and whether they follow a logical pattern i.e. an individual who wants to be 'slim' but does not want to be 'overly hyperactive'.

However, they may associate being 'slim' with being 'overly hyperactive'. Therefore, conflict related to a self element, may highlight difficulties people face with making sense of an element. Bell, Winter and Watson (2004) suggest that conflict in the self may occur after the person experienced traumatic life events. It may be that some people construe developing a chronic health condition as a traumatic life event.

PCT can and has been applied to help understand how people make sense of physical illnesses and how this may relate ongoing psychological and physical difficulties the person may experience.

### **1.11 Physical illness and PCT**

Making sense of the experience of ill health has been researched by Viney (1989), who suggests that people interpret symptoms and develop illness images as a frame of reference for how to act. Viney (1989) studied over 800 people with chronic health conditions of at least 6 months duration or causing permanent disability, between the ages 18-95 years old. Open-ended questions were used and the responses were categorised with content analysis. The results showed that depression images were frequent. Viney (1989) suggested that people felt that depressive feelings were all consuming but that physical problems could be dealt with. The depressive images were dominated by the themes of hopelessness, deprivation, embarrassment and guilt.

The way a disorder is viewed in a given culture or society is also important. In hypothyroidism, it seems that there is a dominant medical model which assumes that people are well when the blood tests are 'normal'. This may be a form of 'pre-emptive' construing, where a construct pigeonholes an element and it cannot be seen as anything different (Kelly, 1955/1991). Therefore, pre-emptive construing may lead doctors to pre-empt that treated hypothyroid patients are symptom-less and inadvertently dismiss people's experiences of persistent symptoms.

The idea that constructs may be a form of illness representation was considered by O'Connor et al. (2009). One of the groups they interviewed were heart transplant patients and they elicited themes, from which constructs were derived. The results

showed that the heart transplant patients used the construct of 'giving help to others' and the opposite pole was 'being ungrateful', which led to the use of an active coping strategy. There was a tendency for patients to not see themselves as ill after transplant. This may be a helpful way of making sense of the world if there are no difficulties after treatment. However, if a person then experiences symptoms, this may invalidate this view. O'Connor et al. (2009) suggest that the representations of self as an ill person, the representation related to the impact of the illness on relationships and the representations of how others view the person as ill may all interact and are important in the adaptation strategies of patients.

#### *1.11.1 Repertory grids used in physical injury and illness*

Repertory grids have been used to study the meaning attributed to the illness and construct systems in patients with a range of different physical problems although not with thyroid disorders. The following discussion will highlight the construal of the self and the structure and content of the construct systems in physical illnesses.

#### *1.11.2 Self construal in physical illness*

The way in which an individual construes his or herself in comparison to his ideal self or self before a physical illness has been found to be important in adjustment. Turpin, Dallos, Owen and Thomas (2009) used repertory grids and Interpretative Phenomenological Analysis to study patients with head and neck cancers and found that the ideal self was closely related to the pre-cancer self. The authors suggested that this negative shift in self perception from before the illness is important to address for adjustment purposes. Charmaz (1995) suggested that people may separate their view of their body from the self view as a normative stage in the adjustment process. Skelley (2002) used repertory grids with patients after stroke and found that there was a significant difference between how the person viewed the self now as opposed to before the stroke and larger distances were related to depression. This may represent a loss of a self identity, which was important for the person.

Repertory grids have also highlighted how constructs may influence coping and treatment outcomes. Large (1985) explored pain patients' construct systems before and after a pain management treatment programme. He found that a greater difference between how a person with chronic pain construes the self now and how they construe their ideal self led to a greater change in pain scores after a treatment programme. It was suggested that a large discrepancy was a measure of self-dissatisfaction and that these patients were more open to the self-responsibility in learning pain control techniques. Therefore, construing of the self in physical illness could be suggested to be linked with active coping styles. Large and Strong (1997) found non-patients with chronic low back pain construed coping as a 'necessary evil' but that those people who construed themselves as similar to a person who can cope were not in constant pain. Therefore, how people construe their actions in relation to a condition can result in fewer experiences of the symptoms. However, this sample used non-patients, which might indicate less severe problems than a clinical sample.

An important part of an illness is the effect it might have on the person's identity. In PCT terms, this would relate to the core constructs the person holds about themselves (Kelly, 1995) and also the elements which relate to the self e.g. self now, ideal self. As discussed previously, Leventhal et al. (2001) suggested that aspects of the illness can be integrated into a person's identity. This is similar to Pincus and Morley's (2001) 'Schema Enmeshment Model', which suggests that if the person uses negative parts of the disorder to understand themselves, then they will become depressed. Morley, Davies and Barton (2005) developed a method for exploring how much the pain symptoms were related to the self. They asked participants to give adjectives to describe a future self and then asked participants to judge how much the future self was dependent on the presence or absence of pain, which they called self-pain enmeshment. The authors found that the greater the degree of self-pain enmeshment, the greater the depressive symptoms. In PCT, the way the person construes the self currently could be conceptualised as their identity. If this self construal is similar to the way they construe the self with hypothyroidism (i.e. a closer distance between these elements), then the illness could be hypothesised as part of their identity. If hypothyroidism is construed negatively (i.e. different from their ideal self) then this may be related to depression.

It is important to look at all the self identities related to thyroid disorders as Linville (1987) suggests that multiple self aspects may be more superordinate at different times. She found that more self aspects and greater distinctions between these helped buffer against stress-related illness and depression. However, this research was carried out with undergraduate students and with non-chronic illnesses e.g. flu and headaches. Linville (1987) also used a different measure of self rather than repertory grids.

### *1.11.3 Structure and content of construct systems in physical illness*

Viney (1989) pointed out that the images of illness she found were often constricted, conveying a sense that demands on themselves needed to be reduced. Pessimism and rigidity can often follow this restriction. Turpin et al. (2011) found that cancer patients had tightly organised constructs systems as eight out of the 10 participants had over 60% of the variance accounted for by the first and second principal component factors. Benasayag, Feixas, Mearin, Saul and Laso (2004, as cited in Feixas & Saul, 2004) studied people with Irritable Bowel Syndrome (IBS) using repertory grids. The study showed that sufferers experienced more psychological distress than the non-clinical group and had more implicative dilemmas. The group with IBS and somatisation also had more tightly organised construct systems and higher levels of polarization (extremity of ratings). However, the group sizes were too small for statistical comparisons.

Drysdale (1989) found that in chronic pain patients, there was a tendency to associate having pain with being sensitive compared to acute pain patients. This could be a cognitive conflict as the person may construe not having pain as being insensitive. Conflicts have also been studied in a group of women with fibromyalgia by Compan et al. (2011). There was more psychological distress and 76.7% had at least one implicative dilemma in the clinical group compared to 46.7% in the control group, of women without fibromyalgia. Further details, such as where this control group were recruited from, were not stated in the study. Compan et al. suggest that reducing the symptom of pain may be related to threat to the person's identity. The difference between the construction of the self and ideal self was higher in the clinical sample, indicating that the disorder had a negative impact on their self construal. The

authors also used a classification system to categorise the personal constructs (Feixas, Geldschlager & Neimeyer, 2002) into six areas which are hierarchically organised: moral, emotional, relational, personal, intellectual and values or interests, and they also included physical health as a category. There were significant differences in the moral and physical health areas, which might imply that having the disorder could be related to more important moral constructs. However, the sample was recruited from support groups, which may have biased the results.

### **1.12 Summary of the Literature**

The literature related to adjustment in chronic illness shows that coping and appraisals are related to outcomes and are important to explore in chronic illnesses.

Exploring the way that a person may interpret or construe themselves with a thyroid condition may give a better understanding of how persistent physical and depressive symptoms may be maintained. There appears to be a gap in the literature in adjustment to, and coping with secondary hypothyroidism. By using coping models and personal construct theory, insights may be gained concerning the impact of hypothyroidism on sufferers. Repertory grids and standardised questionnaires will be used to explore the relationship between construing, coping, hypothyroid symptoms and depression.

### **1.13 Hypotheses**

This study will explore how patients with secondary hypothyroidism construe the self in addition to the content and structure of their construct systems, and how these aspects of construing are related to coping, depression and hypothyroid symptoms.

#### *1. Self construing and treated hypothyroidism*

To specifically examine whether persistent hypothyroid symptoms and depression are related to how a person construes their identity, the following hypotheses will be tested:

- a. The greater the relative distance of the self with hypothyroidism, as compared to the self before any thyroid problem, from the ideal self, the greater the number of hypothyroid symptoms and hypothyroid symptom difficulty, depression, and dysfunctional coping scores.
- b. The greater the relative distance between the construal of self now, as compared to the self before any thyroid problem, from the ideal self, the greater the number of hypothyroid symptoms, hypothyroid symptom difficulty, depression, and dysfunctional coping scores.
- c. The more salient an individual's construing of self with hypothyroidism, the higher the depression, hypothyroid symptom frequency and hypothyroid symptom difficulty scores and dysfunctional coping scores.

## *2. Construct systems of treated hypothyroid patients*

In line with the research concerning construing in physical and mental health problems, the following hypotheses have been formed:

### *Structure*

- a. Polarized construing is positively correlated with depression, hypothyroid symptom frequency, hypothyroid symptom difficulty scores and dysfunctional coping style.
- b. The more tightly organised the construct system, the higher the scores of depression, hypothyroid symptom frequency, hypothyroid symptom difficulty and dysfunctional coping styles.

### *Inconsistencies*

- c. Those who have more cognitive conflicts will experience more hypothyroid symptoms and more difficulty with these symptoms, be more depressed and use more dysfunctional coping styles.

### *Content*

- d. The more superordinate the supplied constructs related to hypothyroidism are (i.e. lethargic, depressed, gains weight more easily), the higher the depression,

hypothyroid symptom frequency, hypothyroid symptom difficulty and dysfunctional coping scores.

e. The most common categories of constructs used to construe the self with hypothyroidism will be physical health and emotional categories.

### *3. Coping and hypothyroidism*

It is hypothesised that higher dysfunctional coping will be related to higher depression and number of hypothyroid symptoms and hypothyroid symptom difficulty score.

### *4. Depression and hypothyroid symptoms*

The higher the depression scores, the greater the number of hypothyroid symptoms and hypothyroid difficulty score.

### *5. History of depression*

Those with a history of depression will have higher depression and symptom difficulty scores, greater number of hypothyroid symptoms and greater use of dysfunctional coping strategies.

## 2. METHOD

### 2.1 Design

A cross-sectional correlational design was used to test hypotheses 1-4 and a between subjects design was used to test hypothesis 5.

### 2.2 Participants

Participants were recruited either from an Endocrinology Department at a National Health Service (NHS) General Hospital or through thyroid disorder support groups. Assuming 80% power and alpha 0.05 (1 sided) the sample size required to demonstrate a correlation between grid measures, e.g. element distances, and coping, hypothyroid symptoms and depression scores was 23 participants. A prior power calculation was completed by the programme GPower3 (Erdfelder, Faul & Buchner, 1996).

The inclusion criteria for the study were that the patient had developed hypothyroidism following RAI treatment, did not have subclinical hypothyroidism (i.e. that they would be considered euthyroid), were between 18-65 years old and had been stable on the same dosage of thyroxine medication for three months. This time period is recommended by the BTA (2006) as this allows the medication to stabilise after hormone replacement dosage has been changed. The upper age limit was included due to the possibility of more physical health problems in older age and changes in prevalence of depression following retirement (Villanil, Huppert and Melzer, 2006). Therefore, if people were no longer employed this may have made a difference as to whether any persistent symptoms might interfere with their functioning. Turner (2006) also highlights that older women with hypothyroidism had higher levels of quality of life and therefore, this may have biased the results. Due to the lack of resources it was not possible to include people who did not speak English. However, this did not result in the exclusion of any potential participants.

The total numbers of people who were currently attending or discharged from the endocrinology clinic between 1<sup>st</sup> January 2010 and 2<sup>nd</sup> April 2011 who met the inclusion criteria were 6 men and 13 women. All 19 were invited to take part in the

study and 7 agreed to participate (2 men and 5 women). In relation to the thyroid disorder support groups, it was not possible to gauge how many potential participants met the inclusion criteria. Thirteen participants completed the research through the website (all female). The final sample number was 20 (2 males and 18 females).

## **2.3 Measures**

### *2.3.1 Demographic data and medical information*

Demographic data and medical information regarding the thyroid disorders was also obtained from participants, including age, gender, functioning, social support, time since diagnosis, symptoms and whether they had a history of depression (see Appendix A). For participants recruited from the endocrinology clinic, this information was checked against their medical records with the participants' consent. For participants recruited through support groups, the collection of this data was reliant on self report, which resulted in missing data in relation to blood test results. Where information on dates was required, month and year were used. If the month was missing for the support group participants, June was used as a midpoint.

### *2.3.2 Depression: The Depression Subscale of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)*

This self report measure incorporates two scales; one for anxiety symptoms and one for depression symptoms. This scale has been designed for use with physical health problems and therefore there is less overlap between physical symptoms of illness and the symptoms of depression or anxiety. The measure asks participants to rate 14 statements about anxiety and depression symptoms on a scale of 0 to 3 on how frequently they experience that symptom (7 items for anxiety and 7 items for depression). It takes around 10 minutes to complete and only the data relating to the depression subscale score was used in this study.

The HADS has good psychometric properties in terms of reliability and validity (Bjelland, Dahl, Haug & Neckelmann, 2002) and has been used in many studies of

thyroid disorders. It was therefore felt that the HADS was the most appropriate measure available for this study (Appendix B).

### *2.3.3 Hypothyroid Symptoms: The Thyroid Symptom Rating Questionnaire (ThySRQ; McMillan, Bradley, Razvi & Weaver, 2008)*

This self report measure includes 15 items relating to hypothyroid symptoms (Appendix C). For each item, the participant must answer whether they experience that symptom and then rate how much the symptom bothers them on a scale of 0 (not at all) to 3 (a lot). Therefore, this takes into account the participants' perception of how much difficulty the symptom causes them. It takes around 10 minutes to complete. This appears to be the only self report measure for patients to complete concerning their experience of symptoms of hypothyroidism. Increased symptom bother and increased number of symptoms were shown to be inversely correlated with quality of life (McMillan et al., 2008). Although the authors do not include a total symptom 'bother' or difficulty score, exploratory analyses have shown that the difficulty rating related to each separate symptom had high internal consistency with a Cronbach's alpha of 0.808 (McMillan et al., 2008). Although a forced one-factor analysis indicated that three symptoms did not have high loadings, a total symptom difficulty score was included in this study as this allowed for some exploration of the perception of the impact of the hypothyroid symptoms on the person. The total number of hypothyroid symptoms was also used in the study. The ThySRQ was accepted well by respondents in the McMillan et al. (2008) study but has yet not been evaluated in larger studies.

### *2.3.4 Coping: The Brief COPE (Carver, 1997)*

This self report measure of coping is a shorter version of the COPE, which has 15 subscales with 4 items each. Carver (1997) reported the redundancy in some of the items and that it took too long to complete. The Brief COPE has 28 items, with 14 subscales: active coping, planning, positive reframing, acceptance, humour, religion, using emotional support, using instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement and self blame. Carver (1997) reports satisfactory psychometric properties, similar to the full version.

The measure requires participants to rate the statements related to coping strategies on a scale of 1 (I usually don't do this at all) to 4 (I usually do this a lot). It takes about 10 minutes to complete and can provide an individualised coping profile. The Brief COPE items can be grouped into emotion-focused coping, problem-focused coping and dysfunctional coping, and Cooper, Katona and Livingston (2008) highlight good internal consistencies for these scales ( $\alpha = 0.72, 0.84, 0.75$  respectively). The instructions for the Brief COPE were changed to ensure participants rated how they coped since developing hypothyroidism (Appendix D).

### *2.3.5 Repertory Grid Technique (Kelly, 1955)*

The Repertory Grid is a semi-structured interview, which is used to elicit constructs from individuals related to specific areas of interest (e.g. how the person construes having hypothyroidism). The method asks the individual to consider aspects of themselves and others; and compare and contrast these aspects systematically with each other. This creates bipolar constructs, which individuals can then use as a scale to rate themselves and other people on (Winter, 1992). In this study, 7 people were assessed directly and 13 completed the Repertory Grid online.

The procedure was introduced to participants by explaining that the Repertory Grid was a way of finding out about how they view themselves with different thyroid conditions and how they view other people in their life.

For those participants seen directly, the following 10 elements were provided by the researcher and clearly written on separate pieces of paper.

1. Self now
2. Self before any thyroid problem
3. Self with an overactive thyroid
4. Self with an underactive thyroid
5. Mum (or person who best fits this role)
6. Dad (or person who best fits this role)
7. Partner (or significant person)
8. Person I like
9. Person I dislike
10. Ideal self

For instructions for people completing the Repertory Grid online, please see Appendix R. These elements were specifically chosen as similar compositions have been used in other studies using Repertory Grids with mental health problems and chronic health illness (Compan et al., 2011; Feixas & Saul., 2004). There are elements included which are negatively and positively viewed, which is pertinent to the negative views people with depression hold (Beck, 1995).

Participants were shown the elements and for the non-self related elements were asked to think of a person who fulfilled each role. The constructs of 'depressed-happy', 'hyperactive-lethargic' and 'gains weight easily-doesn't gain weight easily' were provided by the researcher in order to look at how the person construes themselves in relation to these symptoms of hyperthyroidism and hypothyroidism. Ten further constructs were elicited from triads of elements using Kelly's (1955/1991) method by showing three element cards and asking "how are two of these alike and different from the third?" The self now element was kept constant in order to keep the constructs which are elicited related to the self (Fransella et al., 2004). This elicited a pole of a construct. In order to obtain a bipolar construct, participants were asked 'what is the opposite for you?'. The constructs could not be dichotomous such as male-female. After eliciting each construct, one of the cards was taken away and replaced by a different element. All participants were given the same combination of triads. For those participants recruited online, instructions were given to complete the Repertory Grid as above.

Constructs were then used as a scale, assigning 7 to one pole and 1 to the other and each element was rated on this scale. For example, on rating the element 'self now' the participant was asked "On this scale of 1 = gains weight easily to 7 = doesn't gain weight easily, where would you put yourself as you are now?" Completed Repertory Grids were then analysed using the Grice (2008) IDIOGRID programme in order to explore the relationships between the individual's constructions of elements, and the content and structure of the construct system.

### *2.3.5.1 Measures of self construing*

Specific measures were extracted including distances between self now and ideal self (a measure of self esteem), self with hypothyroidism and ideal self, and self before any thyroid problem and ideal self. Relative distances for hypothesis 1a were calculated by subtracting the distance between self before any thyroid problem and ideal self from the distance between self with hypothyroidism and ideal self, which will give information on the change in construing between developing hypothyroidism and how the person viewed themselves before any thyroid problem. The relative distances for hypothesis 1b were calculated by subtracting the distance self before any thyroid problem and ideal self from the distance between self now and ideal self.

Distances between elements range from 0 to approximately 2, where 0 means the elements are viewed in exactly the same way. Therefore, larger distances indicate increasing dissimilarity in how the elements are viewed. Makhlouf-Norris and Norris (1973) suggest that a cut off of a distance below 0.8 indicates similarity in construing two elements and a distance of 1.2 and above indicates dissimilarity in construing. Distances between these two scores show that the elements are neither viewed as alike or different.

Other measures employed in this study included the percentage sum of squares score, which identifies the superordinancy of constructs and the salience of elements, and indicates which are most important to participants (Bannister & Salmon, 1967; cited in Winter, 1992). The larger the percentage of sum of squares for the element self with hypothyroidism indicates how important this element is. Similarly, the percentage sum of squares for the supplied constructs can also be extracted to explore the superordinancy of the supplied constructs related to symptoms of hypothyroidism.

### *2.3.5.2 Measures of the structure of the construct system*

The principal component analysis provides details of the extent to which the elements and constructs are related in the construct system. The total percentage of variance accounted for by the first principal component is a measure of the 'tightness' of

construing and a large percentage indicates that the construct system is tighter and less flexible.

The IDIOGRID programme also provides a measure of how much an individual uses extreme ratings (i.e. 1 or 7) in construing elements. This measure is provided by the amount of variability related to the total sum of squares of the constructs.

#### *2.3.5.3 Measures of the content of the construct system*

Implicative dilemmas can also be indicated by the IDIOGRID programme by exploring the relationship between two types of constructs. *Congruent* constructs are where the participant is relatively happy about how they view themselves now i.e. there is a discrepancy of less than 2 scale points between self now and ideal self. In *discrepant constructs*, there is a discrepancy of over 3 scale points between self now and ideal self, indicating the participant would like to change on this construct. The dilemma occurs when there is correlation between these two types of constructs so that if the person changes on the discrepant construct, there will also be change on a construct that the participant is happy with. Feixas and Saul (2004) suggest a correlation of 0.35 between these two types of constructs for research studies.

Conflict related to particular elements was calculated using the Bell (2004b) GRIDSTAT programme. The percentage of conflict related to each element in the grid indicates if the constructs were applied differently to that element to the way in which they are applied to other elements, i.e. a higher amount indicates that this element does not fit easily within the participant's way of viewing the world. This measure has been discussed in the Introduction and will be described in more detail here. Bell (2004a) describes the measurement of conflict in construct systems as the relationship between an element and two constructs. If there is a balanced relationship with each other, then the longest distance must not exceed the sum of the two smaller distances, such as in a triangle. A conflict arises if this rule is broken and creates 'triangular inequality' (Bell, 2004a). The main conflict of interest was with the self with hypothyroidism element. Therefore, GRIDSTAT identifies all the conflicting triadic comparisons using the element self with hypothyroidism with all the constructs and presents a percentage of all possible comparisons for the element self

with hypothyroidism. The higher the percentage, the more conflict is associated with this element.

A content analysis of the constructs was performed using the Classification System for Personal Constructs (CSPC) developed by Feixas, Geldschlager and Neimeyer (2002). This provides six hierarchically ordered categories: 1. Moral, 2. Emotional, 3. Relational, 4. Personal, 5. Intellectual/Operational and 6. Values and Interests. Supplemental categories were also included 7. Existential and 8. Concrete descriptors and 9. Physical Health (used in the Compan et al., 2011 paper). Using this system, if a construct fits in a higher order level, then it can only be coded in this category. Only value constructs, described as meanings people give to their own and others' characteristics or qualities, can be coded. Feixas et al. (2002) report reliability indices between 0.90 and 0.95, indicating the classification system is very reliable.

## **2.4 Procedure**

For the Endocrinology clinic site, clinicians involved in the care of the patients were given an information sheet about the research (Appendix E), which they used to identify current and discharged patients who met the inclusion criteria. Occasionally this required further information from the potential participants' General Practitioners, i.e. in relation to whether they had been stable on thyroxine for three months. Those who met the inclusion criteria were sent an information sheet (Appendix F) and consent form (Appendix G) by the clinic, including a stamped addressed envelope. Those respondents consenting to participate were then contacted by the researcher to arrange a convenient time for an interview. If the person agreed to participate, their General Practitioner was sent a letter to inform them of their patient's participation (Appendix H). Interviews took place at the General Hospital between January and April 2011. Obtaining demographic and medical information and completing the semi-structured interview and questionnaires took between 1 and 2 hours to complete.

For recruiting through the support groups, details of the research project (Appendix I) were advertised through the British Thyroid Foundation (BTF) website, newsletter and Facebook page and through support group online forums of Thyroid UK website, and Thyroid Patient Advocacy in line with ethical approval (Appendices K to P). Due

to time restraints it was not possible to advertise and interview people directly and therefore potential participants were directed to a website, which included information about the project (Appendix Q). This included questions regarding the inclusion criteria. Participants could not continue if they did not answer 'yes' to the inclusion criteria. Potential participants then had to agree to the points on the consent form (Appendix R) before they would be allowed to move on to the webpage where the instructions for the research project were (Appendix S). A debrief sheet was made available online (Appendix T).

## **2.5 Ethical considerations**

Approval to collect data for the research from the endocrinology clinic was applied for from the NHS Research Ethics committee in July 2010 and the Trust Research and Development Department in August 2010. Permission to proceed was given in November 2010. Amendments were made to make the research available online and recruit through thyroid support groups. Approval to collect data online was applied for from NHS Research Ethics Committee and University of Hertfordshire Research Ethics Committee in December 2010. Permission to proceed was given in January 2011 (see Appendices J-P).

The consent form accompanying the information sheet sent to participants or available on the website informed potential participants that they did not have to participate if they chose not to and that they could withdraw from the study at any time. It was also highlighted to participants recruited through the Endocrinology clinic that their decision to participate or not would not affect the care they received (see Appendix G and R). Participants were assured that confidentiality would be maintained. All questionnaires and interview data were coded numerically to ensure the data was anonymous.

Enquiring about the impact of thyroid disorders on an individual's life and any depressive symptoms meant that it was possible that participants could have become distressed. Debriefing and support was made available after interviews. Participants who completed the research online were given details of support organisations and encouraged to contact them to discuss any distress they may have felt (Appendix T).

As fatigue is an important consideration in patients with hypothyroidism, the researcher regularly checked with the participants and encouraged them to take a break from the research interview if they felt tired.

### 3. RESULTS

This chapter begins with a description of the sample and the descriptive statistics for each measure used in the study. This will be followed by a rationale for the use of non-parametric data analysis. Each research question will then be addressed and exploratory multiple regression analyses will be used to explore whether any variables are significant predictors of depression, hypothyroid symptoms and symptom difficulty. A content analysis of the constructs used in the repertory grids will be provided. Two case examples will also be presented in order to provide in-depth analyses of a participant with a high depression score and one with a low depression score.

#### 3.1 Sample characteristics

As described in the Method section, the total sample of 20 patients consisted of 18 females and 2 males. Eighteen people identified themselves as white British, two participants recruited online stated that they were British but did not identify their ethnicity. Thirteen participants (65%) reported that they were able to participate in the same activities and/or functioning as they were before they developed any thyroid disease problem and seven (35%) reported that they were able to complete some of the functions since being diagnosed. All participants reported having social relationships which they considered supportive. Unfortunately more detailed information about whether the participants were married was not obtained. The other demographic data obtained can be seen in Table 1.

#### 3.2 Descriptive Statistics

**Table 1. Demographic variables**

<b>Age</b>	
Mean (SD)	48.25 (10.44)
Median	46.50
Min-Max	29-65
<b>Recruitment site</b>	
Online	13 (65%)
Endocrinology clinic	7 (35%)

<b>Time since diagnosis of hypothyroidism (in years)</b>	
Mean (SD)	5.02 (5.22)
Median	3.98
Min-Max	4.08 months – 21.14 years
<b>Time since diagnosis of hyperthyroidism (in years)</b>	
Mean (SD)	8.83 (6.45)
Median	7.77
Min-Max	1.09-26.31
<b>Employment</b>	
Full time	11 (55%)
Part time	6 (30%)
None	2 (10%)
Student	1 (5%)
<b>Other significant health problems</b>	
Yes	9 (45%)
No	11 (55%)
Number of people with multiple conditions	4
-What were they?	
-Anaemia	1
-Arthritis	1
-Lumbar fusion	1
-Diabetes	2
-Double vision	1
-Hysterectomy (1 for endometrial hyperplasia)	2
-Jaundice	1
-Thyroid eye disease	2
-Migraines	1
-Bowel abscess	1
-Undiagnosed and difficult to treat skin problem	1
<b>History of depression</b>	
Yes	6 (30%) 5 of which occurred after diagnosis of hyper or hypothyroidism
No	14 (70%)

It should be noted that some people experienced hyperthyroid symptoms for a number of months and even years before diagnosis although the distribution of this data was positively skewed. One person did not notice any symptoms of hyperthyroidism but the condition was detected following routine blood tests. Similarly one person did not experience any symptoms of hypothyroidism before they received

a diagnosis. All but one participant who had a history of depression received antidepressants and one person received counselling. One participant who took antidepressants reported that these made her feel worse and she stopped taking them. All participants who reported a history of depression reported that this had improved.

All participants were receiving thyroxine treatment. Blood test results of TSH, T4 or T3 levels were not available for the majority of participants as this was reliant on the self report of participants, for whom this information may not be known.

### *3.2.1 Descriptive statistics for the depression, hypothyroid symptoms and coping measures*

Table 2 shows that the mean depression score fell below the cut off for clinical depression. However, the scores were wide ranging. Of note is that although all participants should be euthyroid, at least two symptoms were experienced by all participants and the mean score indicated that participants on average experienced over 50% of the possible hypothyroid symptoms. The most common symptoms experienced were tiredness (experienced by 90% of the sample), feeling cold, weight gain, memory problems and feeling depressed or low. The mean score for problem-focused coping was lower than emotion-focused coping or dysfunctional coping, indicating that problem-focused strategies in this sample may not be used as often as emotion-focused or dysfunctional coping strategies in relation to how people cope with hypothyroidism

**Table 2. Descriptive statistics for the HADS depression subscale, ThySRQ and Brief COPE measures**

<b>HADS – depression subscale</b>	
Mean (SD)	5.5 (4.23)
Median	5.5
Min - Max	0-16
<b>ThySRQ – symptom difficulty</b>	
Mean (SD)	13.3 (7.76)
Median	11.5
Min – Max	1-27

<b>ThySRQ - Number of symptoms experienced</b>	
Mean (SD)	7.7 (3.34)
Median	7.5
Min-Max	2-13
<b>Frequency of hypothyroid symptoms</b>	
Tiredness	18
Gained weight	13
Felt colder	14
Constipation	10
Hair problems	7
Skin problems	8
Nail problems	11
Loss of appetite	2
Hearing problems	5
Voice problems	7
Speech problems	10
Memory problems	13
Difficulty concentrating	13 (2 missing)
Dizzy or light headed	10
Felt depressed or low	13
<b>Brief COPE</b>	
Problem focused coping	
Mean (SD)	12.35 (4.87)
Median	11.5
Min – Max	6-21
Emotion focused coping	
Mean (SD)	20.75 (6.27)
Median	21
Min – Max	10-36
Dysfunctional coping	
Mean (SD)	20.45 (6.47)
Median	20
Min – Max	12-32

Appendix U shows Figures 1-6, which display the distribution of the scores obtained on each measure. The horizontal line indicates the median score. The upper boundary indicates the 75<sup>th</sup> percentile and the lower boundary is the 25<sup>th</sup> percentile. The lines above and below the box indicate the largest and smallest scores which are not outliers. Outliers are cases which are 1.5 to 3 box-lengths from the edges of the box and are shown as circles. For example, Figure 3 shows one outlier for the emotion focused coping subscale. It is interesting that the participant concerned stated that she developed depression after the initial antithyroid drugs for

hyperthyroidism and was prescribed Fluoxetine for two years. This participant highlighted that this was successful in treating her depression. The median is relatively close to the centre of the box and therefore the distribution of the data is not skewed by this outlier.

### 3.2.2 Descriptive statistics of the repertory grid measures

Table 3 contains the descriptive statistics related to the elements in participants' repertory grids.

As described in the Method section, the distances between elements range from 0 to approximately 2. A higher score would indicate that the elements are dissimilar to each other and a score of 0 would indicate that the participant sees both elements as identical. A score between 0.8 and 1.2 would suggest that the two elements are neither particularly alike nor different. The scores have been presented in order of the similarity of the elements concerned. The salience of the self with hypothyroidism is indicated by the percentage sum of squares accounted for by this element and the higher the percentage the more salient, or important, the element is. The mean percentage sum of squares for self with hypothyroidism is 16.05 ( $SD = 7.87$ ), median is 15.83, minimum percentage is 3.52 and maximum percentage is 29.45.

**Table 3. Descriptive statistics for repertory grid measures relating to self construal**

<b>Relative distance of self now, compared to self before thyroid problem, from ideal self</b>	
Mean (SD)	0.29 (0.41)
Median	.29
Min – Max	-.40 – 1.31
<b>Relative distance of self with hypothyroidism, compared to self before thyroid problem, from ideal self</b>	
Mean (SD)	0.68 (0.46)
Median	0.71
Min – Max	0 – 1.29
<b>Distance between self before thyroid problem and ideal self</b>	
Mean (SD)	0.69 (0.28)

Median	0.72
Min – Max	0.08 – 1.18
<b>Distance between self now and self with hypothyroidism</b>	
Mean (SD)	0.73 (0.44)
Median	0.85
Min – Max	0-1.36
<b>Distance between self now and self before thyroid problem</b>	
Mean (SD)	0.77 (0.39)
Median	0.67
Min – Max	0.25 – 1.75
<b>Distance between self now and ideal self</b>	
Mean (SD)	0.98 (0.32)
Median	0.90
Min - Max	0.42 – 1.64
<b>Distance between self with hypothyroidism and ideal self</b>	
Mean (SD)	1.37 (0.33)
Median	1.33
Min – Max	0.78-1.87

Appendix U contains Figures 7-15, which show the distributions for the self construing variables. These show that some of the distances are skewed. An outlier can be found in the distance between self now and self before any thyroid problem and consequently the relative distance of self now, compared to self before any thyroid problem, from ideal self. This participant had two courses of RAI as the first was unsuccessful and she scored highly in depression, dysfunctional coping and hypothyroid symptom frequency and difficulty. This extreme case will be discussed in more detail in section 3.7.

The descriptive statistics show that participants viewed themselves now and themselves with hypothyroidism as similar (0.73), with some participants viewing the two elements as identical. Interestingly, the self before a thyroid disorder and ideal self also showed similarity (0.69), indicating that people were fairly happy with themselves before they developed a thyroid disorder. Participants also viewed themselves now as similar to their view of themselves before the disorder (0.77).

However, there was a wide range of distances, indicating variability in construing in the sample.

The mean distance between self now and ideal self (0.98) indicated that participants neither saw these two elements as similar nor dissimilar. Perhaps as expected, a discrepancy can be seen between how the participant views the self with hypothyroidism and the ideal self (1.37), indicating that the self with hypothyroidism was often seen as negative.

Table 4 shows the descriptive statistics of the repertory grid measures relating to structure of construing, constructs, and inconsistencies in construing. The extremity of construing is measured by the variability within the repertory grid. A higher score would indicate more extreme (polarized) construing. The tightness of construing is shown by the amount of variance accounted for by the first principal component, and a higher score would indicate a tighter construct system. The percentage sum of squares accounted for by the supplied constructs shows how superordinate these constructs were. A higher score indicates the construct is more important in the individual's construct system. The table also shows the percentage and number of implicative dilemmas in the grids. The amount of conflict related to self with hypothyroidism is calculated by GRIDSTAT and explores whether constructs are applied differently to this element compared to all the other elements and whether this element is invalidating to the way the individual views their world.

**Table 4. Descriptive statistics of repertory grid measures relating to structure and content of construing**

<b><u>Structure of construct system</u></b>	
<b>Polarization (Variability)</b>	
Mean (SD)	0.61 (0.12)
Median	0.59
Min – Max	0.40 - 0.81
<b>Tightness of construing</b>	
Mean (SD)	54.72 (14.39)
Median	56.90
Min – Max	32.44 – 82.31
<b><u>Constructs</u></b>	
<b>Percentage sum of squares for 'lethargic' construct</b>	
Mean (SD)	6.74 (2.29)

Median	6.83
Min – Max	3.13 – 12
<b>Percentage sum of squares for ‘gains weight easily’ construct</b>	
Mean (SD)	11.06 (4.24)
Median	10.12
Min – Max	5.49 – 24.8
<b>Percentage sum of squares for ‘depressed’</b>	
Mean (SD)	6.36 (2.45)
Median	6.24
Min – Max	1.12 – 10.45
<b><u>Inconsistencies</u></b>	
<b>Presence of Implicative Dilemmas</b>	
Yes	N=8
No	N=12
<b>Percentage of Implicative Dilemmas</b>	
Mean (SD)	1.66 (2.35)
Median	0
Min – Max	0 – 7.58
<b>Total number of Implicative Dilemmas</b>	
Mean (SD)	1.05 (1.504)
Median	0
Min – Max	0 - 5
<b>Percentage of conflict related to self with hypothyroidism</b>	
Mean (SD)	11.10 (6.57)
Median	9.35
Min – Max	1.6 – 23.2

Figures 16-22 (Appendix U) show the distribution of scores related to the structure, content and inconsistencies of the construct system. Of interest is that case 19 is an outlier for the superordinacy of the ‘hyperactive-lethargic’ and ‘gains weight easily-doesn’t gain weight easily’ constructs, indicating that both of these constructs were superordinate in their system. This person had developed hyperthyroidism and become hypothyroid following RAI. However, this participant developed hyperthyroidism for a second time and became hypothyroid again, indicating a more unusual path. An additional outlier was found for the superordinacy of the ‘happy-depressed’ construct, indicating that this construct was not very important for them. This participant had not experienced many symptoms of hyperthyroidism or

hypothyroidism. The distributions of the total number and percentage of implicative dilemmas were negatively skewed.

Table 4 indicates that mean variability within the repertory grids was not extreme. The tightness of construing measure showed that, on average, the first principal component accounted for half of the variance in the construct system. However, there was a wide range, indicating that some participants showed tight, and some showed loose, construing. Implicative dilemmas were found in 40% of the sample. The expected amount of conflict for each element would be 10% (100/10 elements) if the conflict were evenly distributed. The mean percentage of conflict related to the self with hypothyroidism was 11.10%, which suggests that this element showed a moderate degree of conflict.

Throughout the Results section, non-parametric statistics will be reported. The reasons for this include the small sample size and the skewed questionnaire and repertory grid data (see Figures 1-22). This skewed data and presence of outliers would violate the assumption of normal distribution, which would indicate that parametric (Pearson  $r$ ) correlations should not be used. Although multiple regression analyses were carried out, these can only be considered exploratory in view of the data not being normally distributed and due to the lack of power due to the small sample size.

### **3.3 The relationship between demographic information, depression, hypothyroid symptoms and their difficulty and coping**

All measures of correlation reported in this study are based on Spearman's rho correlation and are 1-tailed unless otherwise specified. Two-tailed correlations were used for problem-focused and emotion-focused coping scores as the research shows conflicting relationships between these styles of coping and outcome. Correlations are based on  $n = 20$  unless otherwise stated.

In order to detect whether age was a confounding variable, correlations between age and questionnaire data were conducted (2-tailed). No significant correlations were found between age of participant and depression ( $r_s = -.174$ ;  $p = .462$ ), problem-

focused coping ( $r_s = .224$ ;  $p = .343$ ), emotion-focused coping ( $r_s = .009$ ;  $p = .570$ ), dysfunctional coping ( $r_s = .013$ ;  $p = .957$ ), number of hypothyroid symptoms ( $r_s = .050$ ;  $p = .834$ ) or hypothyroid symptoms difficulty score ( $r_s = .066$ ;  $p = .782$ ).

In order to reveal whether time with hypothyroidism was a confounding variable, correlations between time since diagnosis of hypothyroidism and questionnaire data were conducted (2-tailed). No significant correlations were found between time since diagnosis of hypothyroidism and depression ( $r_s = -.146$ ;  $p = .538$ ), problem-focused coping ( $r_s = .116$ ;  $p = .626$ ), emotion-focused coping ( $r_s = .090$ ;  $p = .704$ ), dysfunctional coping ( $r_s = .090$ ;  $p = .705$ ), number of hypothyroid symptoms ( $r_s = -.111$ ;  $p = .642$ ) or hypothyroid symptoms difficulty score ( $r_s = -.092$ ;  $p = .700$ ).

In order to explore whether time with any thyroid disorder (i.e. including time with hyperthyroidism) was a confounding variable, correlations between time since diagnosis of hyperthyroidism and questionnaire data were conducted (2-tailed). No significant correlations were found between time since diagnosis of hyperthyroidism and depression ( $r_s = -.055$ ;  $p = .819$ ), problem-focused coping ( $r_s = .229$ ;  $p = .332$ ), emotion-focused coping ( $r_s = .094$ ;  $p = .693$ ), dysfunctional coping ( $r_s = .076$ ;  $p = .750$ ), number of hypothyroid symptoms ( $r_s = .015$ ;  $p = .949$ ) or hypothyroid symptoms difficulty score ( $r_s = -.044$ ;  $p = .852$ ).

In addition, Mann-Whitney U tests were conducted to uncover if there were significant differences between those with co-morbid health conditions and those with only a diagnosis of hypothyroidism (2-tailed). No significant differences were found between those with and without co-morbid health conditions on measures of depression ( $z = .345$ ;  $p = .730$ ), problem-focused coping ( $z = .076$ ,  $p = .732$ ), emotion-focused coping ( $z = .343$ ,  $p = .730$ ), dysfunctional coping ( $z = .228$ ,  $p = .819$ ), number of hypothyroid symptoms ( $z = .038$ ,  $p = .969$ ) and hypothyroid symptom difficulty ( $z = .190$ ,  $p = .849$ ). However, there were small numbers in the co-morbid health condition group.

Mann-Whitney U tests were conducted to look for differences between those participants recruited from the endocrinology clinic and those recruited online through support groups. Those recruited from the endocrinology clinic had lower depression scores ( $z = 1.759$ ,  $p = .039$ ), used less emotion focused coping (2 tailed,  $z = 2.226$ ,  $p = .026$ ), and used less dysfunctional coping ( $z = 2.103$ ,  $p = .0175$ ). However, there

were no significant differences between the groups on problem-focused coping (2 tailed  $z = 1.193$ ,  $p = .233$ ), and number of hypothyroid symptoms ( $z = .953$ ,  $p = .341$ ) or hypothyroid symptom difficulty ( $z = -.953$ ,  $p = .17$ ). It may be possible therefore that recruitment location may be a confounding variable. However, the group sizes are small.

Similarly, those who indicated that they were only partly functioning to their normal level following hypothyroidism and were partly able to complete activities before developing hypothyroidism were significantly more depressed than those who indicated that they were functioning to their normal level ( $z = 2.198$ ,  $p = .014$ ). However, there were no significant differences between groups differing on level of functioning in emotion-focused coping (2 tailed,  $z = .278$ ,  $p = .781$ ), problem-focused coping (2 tailed,  $z = .159$ ,  $p = .874$ ), dysfunctional coping ( $z = .873$ ,  $p = .192$ ), number of hypothyroid symptoms ( $z = 1.238$ ,  $p = .108$ ) and hypothyroid symptom difficulty ( $z = .958$ ,  $p = .157$ ). Therefore how the participant views their functioning might be a confounding variable, although again the group sizes are small. Group sizes were too small to examine gender differences or level of employment in relation to the questionnaire data.

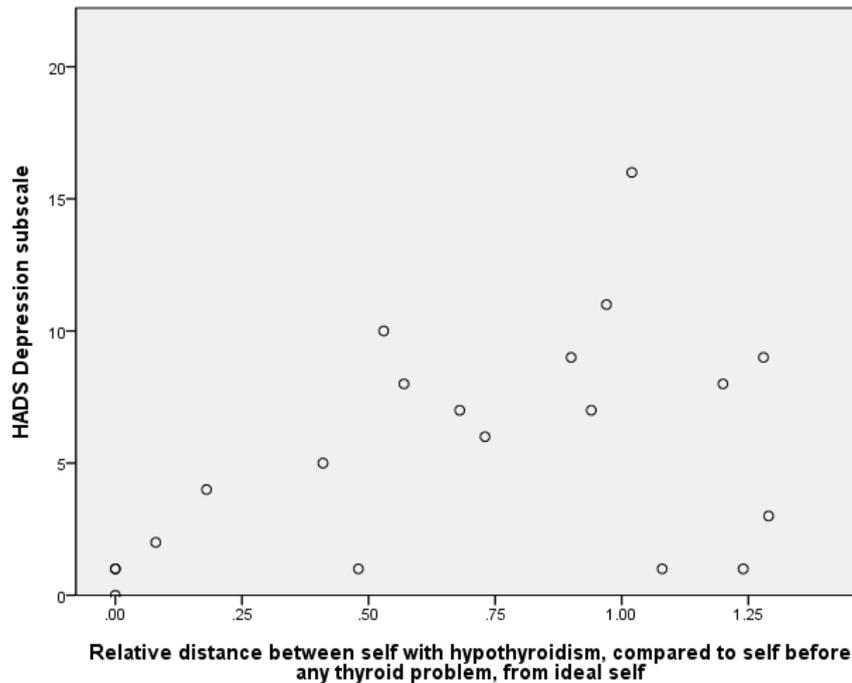
In order to examine the relationship between the repertory grid scores and the individuals' levels of depression, thyroid symptom difficulty and coping, correlational analyses were completed. These will be discussed by hypothesis in the following section.

### **3.4 Inferential statistics**

#### *3.4.1 The relationship between self construing, depression, hypothyroid symptoms and coping*

The more favourably the individual construes the self before any thyroid disorder compared with the self with hypothyroidism, the higher the depression, hypothyroid symptom frequency and difficulty and dysfunctional coping scores.

As Table 5 shows, the relative distance of self with hypothyroidism, compared with self before any thyroid problem, from ideal self significantly and positively correlated with depression scores ( $r_s = .421$ ;  $p = .032$ ). However, no significant correlations were found between this relative distance and any other scores.



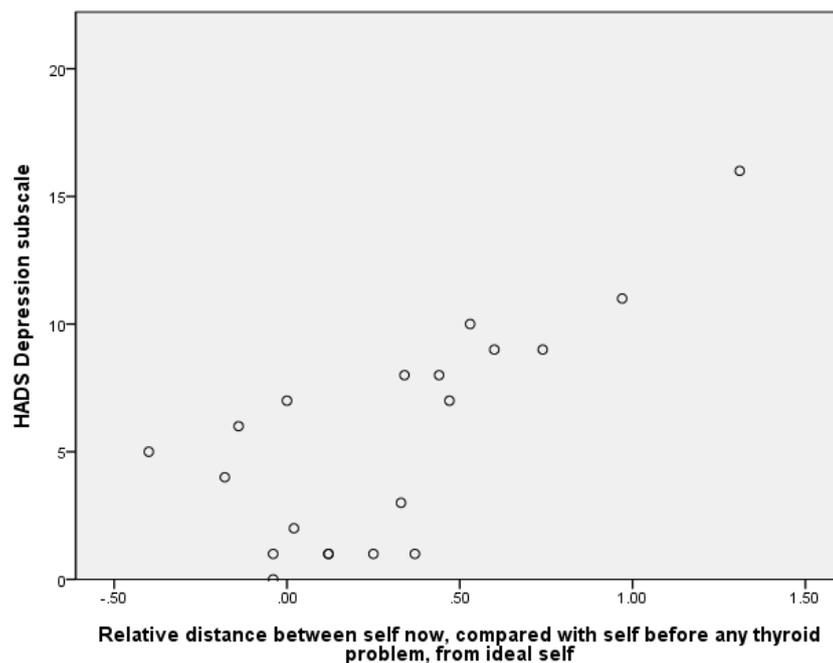
**Figure 24. Scatterplot showing the correlation between the relative distance of self with hypothyroidism, compared with self before any thyroid problem, from ideal self and depression scores**

The scatterplot highlights three participants who saw themselves much more favourably before any thyroid problem compared to themselves with hypothyroidism but had low depression scores. Two of these participants had had a thyroid disorder for at least nine years, which may have meant they were more adjusted to the problem.

Some participants may no longer believe that they are hypothyroid and therefore correlations were performed between questionnaire data and the relative distance of self now, compared to self before any thyroid problem, from ideal self.

The more favourably the individual construes the self before any thyroid disorder compared with the self now, the higher the depression, hypothyroid symptom frequency and difficulty and dysfunctional coping scores.

As Table 5 shows, the relative distance of self now, compared with self before any thyroid problem, from ideal self was significantly and positively correlated with depression scores ( $r_s = .672$ ;  $p = .001$ ), dysfunctional coping scores ( $r_s = .478$ ;  $p = .016$ ), hypothyroid symptom difficulty ( $r_s = .447$ ;  $p = .024$ ) and number of hypothyroid symptoms ( $r_s = .394$ ;  $p = .043$ ). No significant correlations were found between these relative distances and emotion-focused or problem focused coping.



**Figure 25. Scatterplot of the correlation between the relative distance of self now, compared with self before a thyroid problem, from ideal self and depression scores**

Figure 25 shows that there are a cluster of people who view themselves as favourably now as they did before the thyroid problem i.e. that there has not been any change in how they viewed themselves due to a thyroid disorder. As might be expected these participants have very low depression scores.

Salience of self with hypothyroidism

As indicated in Table 5, no significant correlations were found between the percentage sum of squares for the element self with hypothyroidism and depression, any coping strategies, number of hypothyroid symptoms or hypothyroid symptom difficulty.

**Table 5. Correlations (Spearman's Rho) between self construing and depression, hypothyroid symptoms and coping**

	Relative distance of self with hypothyroidism, compared to self before any thyroid problem, from ideal self	Relative distance of self now, compared to self before any thyroid problem, from ideal self	Salience of self with hypothyroidism
<b>HADS depression subscale</b>			
$r_s$	.421	.672	.350
Sig. (1 tailed)	.032	.001	.065
<b>Dysfunctional coping</b>			
$r_s$	.241	.478	.329
Sig. (1 tailed)	.153	.016	.078
<b>Problem-focused coping</b>			
$r_s$	.081	-.054	.336
Sig. (2 tailed)	.734	.822	.168
<b>Emotion-focused coping</b>			
$r_s$	.023	-.224	-.133
Sig. (2 tailed)	.922	.342	.574
<b>Hypothyroid Symptom Difficulty</b>			
$r_s$	.189	.447	.335
Sig. (1 tailed)	.212	.024	.074
<b>Number of Hypothyroid Symptoms experienced</b>			
$r_s$	.346	.394	.358
Sig. (1 tailed)	.067	.043	.061

### Exploratory group analyses

Exploratory analyses were performed to look for significant differences between those who identify themselves now with having hypothyroidism and those who do not. The sample was grouped by distances into those who viewed the self now similarly to self with hypothyroidism (distance of less than 0.8 between the two elements) (n=10) and those who did not (n = 10).

Mann Whitney U tests were performed, which found that those who identified themselves now with hypothyroidism were not significantly different from those who did not identify with hypothyroidism on depression scores ( $z = -1.182$ ,  $p = .119$ ), number of hypothyroid symptoms ( $z = -.876$ ,  $p = .191$ ), hypothyroid symptom difficulty ( $z = -1.403$ ,  $p = .081$ ), dysfunctional coping scores ( $z = -.303$ ,  $p = .381$ ) and emotion-focused coping (2 tailed,  $z = .1403$ ,  $p = .161$ ). There was a trend towards significance for problem-focused coping (2 tailed,  $z = 1.858$ ,  $p = .063$ ). This would suggest that people who construe themselves now differently from self with hypothyroidism use more problem-focused coping strategies. However, group sizes are small and therefore should be interpreted with caution. Table 6 shows the median scores of the groups.

**Table 6. Medians of depression, coping and hypothyroid symptom scores, grouped by those who identify with negative aspects of hypothyroidism**

	Participants who viewed self now as similar to hypothyroid self (n = 10)	Participants who did not view self now as similar to hypothyroid self (n = 10)
<b>HADS depression subscale</b>		
Median	8.50	4.50
SD	5.38	2.71
<b>Dysfunctional coping subscale</b>		
Median	21.50	19
SD	7.56	5.49
<b>Emotion focused coping subscale</b>		
Median	19.50	21.50
SD	5.34	6.49

<b>Problem-focused coping subscale</b>		
Median	8.50	14.50
SD	4.25	4.86
<b>Number of hypothyroid symptoms</b>		
Median	9	6.50
SD	3.86	2.81
<b>Hypothyroid symptom difficulty</b>		
Median	17	9
SD	9.49	4.69

Exploratory analyses were performed to look for significant differences between those who identify themselves now with having hypothyroidism and also view hypothyroidism negatively, and those who do not. The sample was grouped by distances into those who viewed the self now similarly to self with hypothyroidism (distance of less than 0.8 between the two elements) and also viewed the self with hypothyroidism dissimilarly from ideal self i.e. a distance over 1.20 between self with hypothyroidism and ideal self (n=6) and those who did not (n = 14).

Mann Whitney U tests were performed, which found that those who identified themselves now with a negative view of hypothyroidism showed significantly higher depression scores ( $z = 3.453$ ,  $p = .0005$ ), dysfunctional coping scores ( $z = 2.685$ ,  $p = .0035$ ), number of hypothyroid symptoms ( $z = 2.910$ ,  $p = .002$ ) and hypothyroid symptom difficulty ( $z = 3.305$ ,  $p = .0005$ ). No significant differences were found between the groups on emotion-focused coping (2 tailed,  $z = .951$ ,  $p = .341$ ) and problem-focused coping (2 tailed,  $z = .248$ ,  $p = .804$ ). However, group sizes are small and therefore should be interpreted with caution. Table 7 shows the median scores of the groups.

**Table 7. Medians of depression, coping and hypothyroid symptom scores, grouped by those who identify with negative aspects of hypothyroidism**

	<b>Participants who viewed self now as similar to hypothyroid self and hypothyroidism viewed negatively (n = 6)</b>	<b>Participants who did not view self now as similar to hypothyroid self and hypothyroidism viewed negatively (n = 14)</b>
<b>HADS depression subscale</b>		
Median	9.50	2.50
SD	2.88	2.76
<b>Dysfunctional coping subscale</b>		
Median	26.5	17
SD	4.32	5.58
<b>Emotion focused coping subscale</b>		
Median	19.5	21.50
SD	3.72	7.01
<b>Problem-focused coping subscale</b>		
Median	12	11.50
SD	4.32	5.24
<b>Number of hypothyroid symptoms</b>		
Median	11.50	6
SD	1.79	2.81
<b>Hypothyroid symptom difficulty</b>		
Median	23.5	8.5
SD	4.55	4.92

*3.4.2 The relationship between the structure and content of the construct system and depression, coping and hypothyroid symptoms*

As Table 8 shows, polarization of construing was significantly and positively correlated with depression scores ( $r_s = .469$ ;  $p = .018$ ), as was the tightness of construing ( $r_s = .417$ ;  $p = .034$ ). Tightness of construing was also significantly correlated with the number of hypothyroid symptoms experienced ( $r_s = .414$ ,  $p =$

.035). No other significant correlations were found between the structure of the construct system and depression, hypothyroid symptoms and coping scores.

**Table 8. Correlations (Spearman's Rho) between structure of the construct system and depression, hypothyroid symptoms and coping**

	<b>Polarization of construing</b>	<b>Tightness of construing</b>
<b>HADS depression subscale</b>		
$r_s$	.469	.417
Sig. (1 tailed)	.018	.034
<b>Dysfunctional coping</b>		
$r_s$	.287	.210
Sig. (1 tailed)	.110	.187
<b>Problem-focused coping</b>		
$r_s$	.227	.048
Sig. (2 tailed)	.704	.84
<b>Emotion-focused coping</b>		
$r_s$	.321	.100
Sig. (2 tailed)	.168	.676
<b>Hypothyroid Symptom Difficulty</b>		
$r_s$	.157	.215
Sig. (1 tailed)	.255	.181
<b>Number of Hypothyroid Symptoms experienced</b>		
$r_s$	.231	.414
Sig. (1 tailed)	.164	.035

As Table 9 shows, no significant correlations were found between inconsistencies in the construct system and depression, hypothyroid symptom and coping scores. However, the correlation between the percentage of conflict related to self with hypothyroidism and depression was approaching significance ( $p = .056$ ).

**Table 9. Correlations (Spearman's Rho) between measures of inconsistencies in the construct system and depression, hypothyroid symptoms and coping**

	Percentage of implicative dilemmas	Total number of implicative dilemmas	Percentage of conflict related to self with hypothyroidism
<b>HADS depression subscale</b>			
$r_s$	-.060	-.081	.336
Sig. (1 tailed)	.401	.367	.056
<b>Dysfunctional coping</b>			
$r_s$	.006	-.012	.317
Sig. (1 tailed)	.490	.480	.086
<b>Problem-focused coping</b>			
$r_s$	-.201	-.281	.148
Sig. (2 tailed)	.394	.400	.534
<b>Emotion-focused coping</b>			
$r_s$	-.122	-.122	.231
Sig. (2 tailed)	.607	.610	.328
<b>Hypothyroid Symptom Difficulty</b>			
$r_s$	.138	.118	.064
Sig. (1 tailed)	.281	.310	.395
<b>Number of Hypothyroid Symptoms experienced</b>			
$r_s$	-.033	-.049	.064
Sig. (1 tailed)	.445	.419	.395

Mann-Whitney tests were carried out to look for any differences between those who had implicative dilemmas and those who did not in depression scores, hypothyroid symptom frequency and difficulty and coping but none were found (Table 10).

**Table 10. Differences in depression, hypothyroid symptoms and coping scores between those who had implicative dilemmas and those who did not**

<b>Measures</b>	<b>Z</b>	<b>P</b>
<b>HADS depression subscale</b> (Significance 1 tailed)	.428	.335
<b>Dysfunctional coping subscale</b> (Significance 1 tailed)	.232	.409
<b>Problem-focused coping subscale</b> (Significance 2 tailed)	.813	.416
<b>Emotion-focused coping subscale</b> (Significance 2 tailed)	.813	.416
<b>Hypothyroid symptom difficulty</b> (Significance 1 tailed)	.425	.336
<b>Number of hypothyroid symptoms experienced</b> (Significance 1 tailed)	.311	.378

Table 11 shows that the only significant correlation between the importance of the supplied constructs and the other scores was a positive correlation between the superordinacy of the happy - depressed construct and the problem focused coping subscale ( $r_s = .487$ ,  $p = .03$ ). Therefore, the more important being depressed or happy is in the individual's view of the world, the greater the use of problem focused coping.

**Table 11. Correlations (Spearman's Rho) between the importance of the constructs hyperactive - lethargic, gains weight easily - doesn't gain weight easily, depressed - happy and depression, hypothyroid symptoms and coping**

	<i>Percentage of sum of squares of hyperactive - lethargic construct</i>	<i>Percentage of sum of squares of gains weight easily - doesn't gain weight easily construct</i>	<i>Percentage of sum of squares of depressed - happy construct</i>
<b>HADS depression subscale</b>			
$r_s$	.150	-.194	.068
Sig. (1 tailed)	.264	.206	.389
<b>Dysfunctional coping</b>			
$r_s$	.175	-.005	.209
Sig. (1 tailed)	.230	.492	.189
<b>Problem-focused coping</b>			
$r_s$	-.158	.172	.487
Sig. (2 tailed)	.504	.468	.03
<b>Emotion-focused coping</b>			
$r_s$	-.121	.122	.285
Sig. (2 tailed)	.610	.608	.222
<b>Hypothyroid Symptom Difficulty</b>			
$r_s$	.152	.012	-.122
Sig. (1 tailed)	.261	.480	.304
<b>Number of Hypothyroid Symptoms experienced</b>			
$r_s$	.115	.005	.110
Sig. (1 tailed)	.314	.492	.332

Content analysis of the constructs from the repertory grids

As discussed in the Method section, Feixas et al. (2002) proposed a classification system for analysing the content of constructs. In order to complete this, constructs were allocated to one category only. There were a total of 179 constructs available for categorisation. As per the guidelines for classifications, if a construct appeared to

fit more than one category, the more superordinate category in the hierarchy was selected. In order to determine inter-rater reliability, another Trainee Clinical Psychologist who had used the system also independently categorised the constructs. The two raters agreed on 70.4% of the categorisation of the constructs. Table 12 shows the number and percentage of times that the construct was applied to a category. It can be seen that the most common category was the emotional category as 23.5% of the constructs were allocated to this category and the relational category was the second most commonly used category with 21.8% of the constructs.

**Table 12. Categorisation of the construct poles elicited in the repertory grids**

Category	Number of times this category was used	Percentage of the total number of constructs
<b>Moral category e.g.</b> Kind-thoughtless, generous-tight, integrity-deceitful and dishonest	17	9.5%
<b>Emotional category e.g.</b> Irritable-calm, angry-peaceful, bad-tempered - patient	42	23.5%
<b>Relational category e.g.</b> Outspoken-reserved, supportive-critical, more outgoing-introverted	39	21.8%
<b>Personal category e.g.</b> Active-sedentary, resilient-weak, easy-going - rigid	29	16.2%
<b>Intellectual/Operational category e.g.</b> Struggling-coping, knowledgeable-stupid, not academic-academic	9	5%
<b>Values and interests category e.g.</b> Interested in football-no interest in football, scientific interest in natural world-general interest in natural world, like the place where you work-negative atmosphere	11	6.1%
<b>Existential category e.g.</b> Happy with life-unhappy with life, content-lost	6	3.4%
<b>Concrete descriptors category e.g.</b> Fatter- thinner, employed-unemployed, fat-slim	10	5.6%
<b>Physical category e.g.</b> Have energy-sluggish, tiredness-full of vigour and healthy	16	8.9%

In order to look more closely at the construing of the element 'self with hypothyroidism', the poles of constructs applied to this element with an extreme rating (i.e. 1 or 7) were examined. Table 13 shows the frequency and the percentage of the category used. The pole of the construct which was applied to self with hypothyroidism is underlined. The total number of constructs applied to self with hypothyroidism using an extreme rating was 63. Table 13 highlights that the most common category of constructs applied with an extreme rating to self with hypothyroidism was the physical category (38.1%) followed by the emotion category (20.6%). Table 13 also highlights which subcategory pole of the main classification system the extreme rated construct pole can be categorised by. It can be seen that after the physical category, the most used subcategory was 'introverted'.

**Table 13. Content analysis of the construct poles applied to self with hypothyroidism**

<b>Construct poles</b> (the pole of the construct applied to self with hypothyroidism with an extreme rating is underlined)	<b>Frequency</b>	<b>Percentage</b>
<b>Moral category</b>	2	3.2%
<i>Altruist</i> <u>Kind</u> – cruel		
<i>Sincere</i> <u>Having integrity</u> – deceitful and dishonest		
<b>Emotion</b>	13	20.6%
<i>Visceral</i> <u>Impatient</u> - patient		
<i>Pleasant</i> <u>Caring</u> – rude		
<i>Cold</i> <u>Bad-tempered</u> – humorous, good sense of humour – miserable,		
<i>Pessimistic</i> Positive – <u>negative</u> , optimistic – <u>realistic</u> , enthusiastic – <u>life-weary</u>		
<i>Balanced</i> <u>Chilled</u> – erratic		
<i>Unbalanced</i> Balanced – <u>mercurial</u> , <u>anxious</u> – calm, <u>moody</u> – stable		

<p><i>Specific emotion</i> happy – <u>depressed</u> (supplied construct), <u>happy</u> – depressed (supplied construct)</p> <p style="text-align: center;"><b>Relational</b></p> <p><i>Introverted</i> Confident – <u>self conscious</u>, <u>reserved</u> – outgoing, flamboyant – <u>quiet</u>, <u>outgoing</u> – <u>insular</u>, free – <u>inhibited</u></p> <p><i>Relational ‘other’ subcategory</i> <u>Trusting</u> – predatory</p>	6	9.5%
<p style="text-align: center;"><b>Personal</b></p> <p><i>Weak</i> Strong – <u>weak</u>, resilient – <u>weak</u></p> <p><i>Indecisive</i> Decisive – <u>indecisive</u></p> <p><i>Flexible</i> <u>Laidback</u> – uptight</p> <p><i>Personal ‘other’ subcategory</i> <u>Slower</u> – faster, fun-loving – <u>cautious</u>,</p>	6	9.5%
<p style="text-align: center;"><b>Intellectual/operational</b></p> <p><i>Unfocused</i> Sharp-minded – <u>poor concentration</u>, <u>muddled</u> – lucid, steady – <u>lack of concentration</u></p> <p><i>Incapable</i> Coping – <u>struggling</u></p> <p><i>Uncultured</i> Knowledgeable – <u>stupid</u></p>	5	7.9%
<p style="text-align: center;"><b>Values and interests</b></p> <p><i>Ideological, religious, moral values</i> <u>Sinner</u> – Jesus</p> <p><i>Values and specific interests</i> <u>Interested in football</u> – not interested in football</p>	2	3.2%
<p style="text-align: center;"><b>Existential</b></p> <p><i>Emptiness</i> Fortunate – <u>unfortunate</u></p>	1	1.6%
<p style="text-align: center;"><b>Concrete descriptors</b></p> <p><i>Physical characteristics</i> Slim – <u>fat</u>, <u>alive</u> - deceased</p>	4	6.3%

<p><i>Social roles</i>  <u>unemployed</u> – employed, <u>professional</u> - unprofessional</p> <p style="text-align: center;"><b>Physical</b></p> <p><u>Tired</u> – active, <u>lethargic</u> – energetic, <u>sleepy</u> – lively, alert – <u>tired</u>, normal sleep pattern – <u>abnormal sleep pattern</u>, muscles not aching – <u>muscle pain</u>, happy – <u>lethargic</u>, hyperactive – <u>lethargic</u>, (supplied construct) doesn't gain weight easily – <u>gains weight easily</u> (supplied construct)</p>	<p style="text-align: center;">24</p> <p>Supplied physical constructs used 17 times</p>	<p style="text-align: center;">38.1%</p>
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### 3.4.3 Exploratory multiple regression analyses

In order to explore the possible predictors of depression and thyroid symptom frequency and difficulty, multiple regression analyses were conducted. The selection of predictors was informed by minimum correlation of 0.40 and maximum p values of 0.10 shown in Tables 5, 8, 9 and 11. The maximum number of predictors used was 3 due to the lack of power. For depression, two analyses were performed; one related to the construing relating to the self (Table 5 correlations) and one related to the structure and content of the construct system (Tables 8 and 9). However, there were not enough significant correlations that could be grouped theoretically for thyroid symptoms and therefore all correlations of 0.40 and above and p value of < 0.10 were entered into the model. For hypothyroid symptom frequency and hypothyroid symptom difficulty, only one predictor met the criteria above and therefore multiple regressions were not calculated. The results of the multiple regression analyses are shown in Tables 14a and 14b (for depression).

**Table 14a. Multiple regression analysis of repertory grid measures of self construal on the depression scores**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>t</b>	<b>P</b>
Relative distance of self with hypothyroidism, compared with self before any thyroid disorder, from ideal self	1.497	.158	.880	.391
Relative distance of self now, compared with self before any thyroid disorder, from ideal self	6.952	.664	3.706	.002

Adjusted  $R^2 = .505$ ,  $F(2, 17) = 10.696$ ,  $p = .001$

As can be seen in Table 14a, 50.5% of the variance in depression can be explained by the 2 predictors above. The relative distance of self now, compared to self before any thyroid problem, from the ideal self was a significant and strong predictor of the depression scores. However, the relative distance of self with hypothyroidism, compared with self before any thyroid disorder, from ideal self was not a significant predictor of depression scores.

**Table 14b. Multiple regression analysis of repertory grid measures related to the structure of the construct system on depression scores**

Independent variable	B	Beta	t	P
Polarization of construing	11.948	.342	1.564	.136
Tightness of construing	.087	.324	1.482	.157

Adjusted  $R^2 = .224$ ,  $F(2, 17) = 3.739$ ,  $p = .045$

Table 14b shows polarization and tightness of construing accounted for 22.4% of the variance in depression scores. However, no construct system measures were significant predictors of the depression scores and therefore this is not a reliable model.

#### *3.4.4 The relationship between dysfunctional coping and depression and hypothyroid symptom frequency and difficulty*

Table 15 shows that dysfunctional coping was significantly and positively correlated with depression ( $r_s = .824$ ,  $p < .001$ ), hypothyroid symptom difficulty ( $r_s = .542$ ,  $p = .007$ ) and number of hypothyroid symptoms experienced ( $r_s = .491$ ,  $p = .014$ ). No significant correlations were found with emotion-focused and problem-focused coping.

**Table 15. Correlations between coping and depression and hypothyroid symptom frequency and difficulty**

	<b>Dysfunctional coping (1 tailed)</b>	<b>Emotion-focused coping (2 tailed)</b>	<b>Problem-focused coping (2 tailed)</b>
<b>HADS depression subscale</b>			
$r_s$	.824	.033	.367
Sig.	.000	.891	.112
<b>Hypothyroid Symptom Difficulty</b>			
$r_s$	.542	-.167	.206
Sig.	.007	.482	.384
<b>Number of Hypothyroid Symptoms experienced</b>			
$r_s$	.491	-.023	.374
Sig.	.014	.924	.105

In light of the above significant correlations, a multiple regression analysis was performed adding dysfunctional coping as a variable, replacing those variables that were not significant in the previous models of depression (Table 16). For hypothyroid symptom difficulty and hypothyroid symptom frequency, multiple regression analyses were performed including the correlations which met the minimum size of the correlation co-efficient of 0.40 and above and p value of less than 0.10. These results are shown in Tables 17 and 18.

**Table 16. Multiple regression analysis of relative distance of self now, compared to self before any thyroid problem, from ideal self and dysfunctional coping on depression scores.**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Relative distance of self now, compared with self before any thyroid disorder, from ideal self	5.378	.514	3.994	.001
Dysfunctional coping	.352	.527	4.099	.001

Adjusted  $R^2 = .740$ ,  $F(2, 17) = 28.009$ ,  $p = <.001$

Table 16 shows the regression model for depression including the predictor variable dysfunctional coping. The model accounts for 74% of the variance in depression scores. Both the relative distance of self now, compared to self before any thyroid

problem, from ideal self and dysfunctional coping were significant predictors of an individual's depression score.

**Table 17. Multiple regression analysis of relative distance of self now, compared to self before any thyroid problem, from ideal self and dysfunctional coping on hypothyroid symptom difficulty**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Relative distance of self now, compared with self before any thyroid disorder, from ideal self	6.505	.346	.1.659	.115
Dysfunctional coping	.472	.393	1.886	.077

Adjusted  $R^2 = .316$ ,  $F(2, 17) = 5.383$ ,  $p = .015$

Table 17 shows the regression model for hypothyroid symptom difficulty including the predictor variable dysfunctional coping. Overall, the model accounted for 31.6% of the variance in hypothyroid symptom difficulty. However, neither variable was a significant predictor and therefore the model is not reliable although dysfunctional coping was approaching significance.

**Table 18. Multiple regression analysis of tightness of construing and dysfunctional coping on hypothyroid symptom frequency**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Tightness of construing	.074	.319	.1.578	.133
Dysfunctional coping	.218	.422	2.087	.052

Adjusted  $R^2 = .247$ ,  $F(2, 17) = 4.5108$ ,  $p = .035$

Table 18 shows the regression model for hypothyroid symptom frequency including the predictor variable dysfunctional coping. Overall, the model accounted for 24.7% of the variance in hypothyroid symptom frequency. However, neither variable was a significant predictor although dysfunctional coping was approaching significance.

### 3.4.5 The relationship between depression and hypothyroid symptom frequency and difficulty

It was found that depression was significantly and positively correlated with hypothyroid symptom frequency ( $r_s = .744$ ,  $p < .001$ ) and hypothyroid symptom difficulty ( $r_s = .708$ ,  $p = <.001$ ).

In light of the above significant correlations, multiple regression analyses were performed for depression (Table 19), hypothyroid symptom frequency (Table 20) and hypothyroid symptom difficulty (Table 21). The previous depression model in Table 16 showed that both dysfunctional coping and relative distance of self now, compared with self before any thyroid problem, from ideal self were significant predictors. Due to lack of power only one other predictor variable was included in the exploratory multiple regression models. Hypothyroid symptom frequency was added to the depression model as it had the larger correlation size (Table 19).

**Table 19. Multiple regression analysis of dysfunctional coping, hypothyroid symptom frequency and relative distance of self now, compared with self before any thyroid problem, from ideal self on depression.**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Dysfunctional coping	.268	.400	3.581	.002
Relative distance of self now, compared with self before any thyroid problem, from ideal self on depression.	4.314	.412	3.775	.002
Hypothyroid symptom frequency	.459	.355	3.143	.006

Adjusted  $R^2 = .829$ ,  $F(2, 17) = 31.717$ ,  $p <.001$

The model accounted for 82.9% of the variance and all three predictors were significant, indicating it is a reliable model.

Table 20 shows the results of the multiple regression analysis for hypothyroid symptom frequency. Depression scores replaced the variable tightness of construing, which was a non-significant predictor of hypothyroid symptom frequency in the previous model.

**Table 20. Multiple regression analysis of dysfunctional coping and depression on hypothyroid symptom frequency**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Dysfunctional coping	-.069	-1.34	-.545	.593
Depression	.637	.824	3.345	.004

Adjusted R<sup>2</sup> = .479, F(2, 17) = 9.734, p = .002

The model accounted for 47.9% of the variance, which is an increase on the previous model (Table 18). However, depression was the only significant predictor of hypothyroid symptom frequency.

Table 21 shows the results of the multiple regression analysis for hypothyroid symptom difficulty. Depression scores replaced relative distance of self now, compared with self before any thyroid disorder, from ideal self, which was a non-significant predictor in the previous model.

**Table 21. Multiple regression analysis of dysfunctional coping and depression on hypothyroid symptom difficulty**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Dysfunctional coping	0.41	.034	.133	.896
Depression	1.220	.679	2.653	.017

Adjusted R<sup>2</sup> = .497, F(2, 17) = 8.393, p = .003

The model accounted for 49.7% of the variance, which is an increase on the previous model (Table 17). However, depression was the only significant predictor of hypothyroid symptom difficulty.

### *3.4.6 Is there a difference between those who do and do not have a history of depression in the current depression, hypothyroid symptom and coping scores?*

Mann-Whitney U tests were performed to examine if those who had a history of depression (n = 6) differed from those who do not have a history of depression (n = 14) in current depressive symptoms, hypothyroid symptom frequency and hypothyroid symptom difficulty and coping strategies (Table 22).

**Table 22. Differences (Mann-Whitney U) between those with history of depression and those without a history of depression on current depression, hypothyroid symptoms and coping scores.**

<b>N= 20</b>	<b>Z =</b>	<b>P =</b>
<b>HADS depression score</b> (Significance 1 tailed)	1.373	.089
<b>Dysfunctional coping subscale</b> (Significance 1 tailed)	.290	.386
<b>Problem-focused coping subscale</b> (Significance 2 tailed)	1.655	.098
<b>Emotion-focused coping subscale</b> (Significance 2 tailed)	.826	.409
<b>Hypothyroid symptom difficulty</b> (Significance 1 tailed)	1.322	.093
<b>Number of hypothyroid symptoms experienced</b> (Significance 1 tailed)	1.871	.03

Table 22 shows that there was a significant difference in those with and without a history of depression on the number of hypothyroid symptoms experienced ( $z = 1.871$ ;  $p = .03$ ). Those who had a past history of depression experienced significantly more hypothyroid symptoms (median = 9.83) than those without a history of depression (median = 6.79).

### 3.5 Case example 1

In order to explore the relationship between construing and depressive and hypothyroid symptoms, an example of a repertory grid will be presented of an individual who scored highly for depressive and hypothyroid symptoms.

### *3.5.1 Background information on case example 1: Mary*

Mary (pseudonym) is a 34 year old, White British female who is working full time. She completed the grid online. She reported that she was partly functioning again after developing hypothyroidism and she does not have a history of depression. Mary noticed symptoms of hyperthyroidism in 2000 where she experienced weight loss, severe itching, hair loss, tremor and goitre. However, she was not diagnosed until 2007. Mary underwent two courses of RAI; the first in May 2009 and then again in November 2009. She developed hypothyroid symptoms in December 2009 of feeling 'ice cold', lacking energy, sudden weight gain and hair loss after previous improvement. She was diagnosed and started on thyroxine in December 2009 and is currently taking 112mcg daily. Mary reported that her most recent blood test had shown a TSH of 0.98 and that she does not have any other significant health problems.

### *3.5.2 Mary's questionnaire scores*

Mary scored 16 on the HADS depression subscale, which surpasses the cut off for clinical depression. She scored 13 for emotion-focused coping, 8 for problem-focused coping and 22 for dysfunctional coping, indicating that she uses more dysfunctional coping strategies in relation to the hypothyroidism. Mary reported 12 out of 15 hypothyroid symptoms and her total symptom difficulty score was 23 out of a possible maximum of 45, which indicates that she experiences a high number of symptoms and that these bother her moderately.

### *3.5.3 Mary's Repertory Grid*

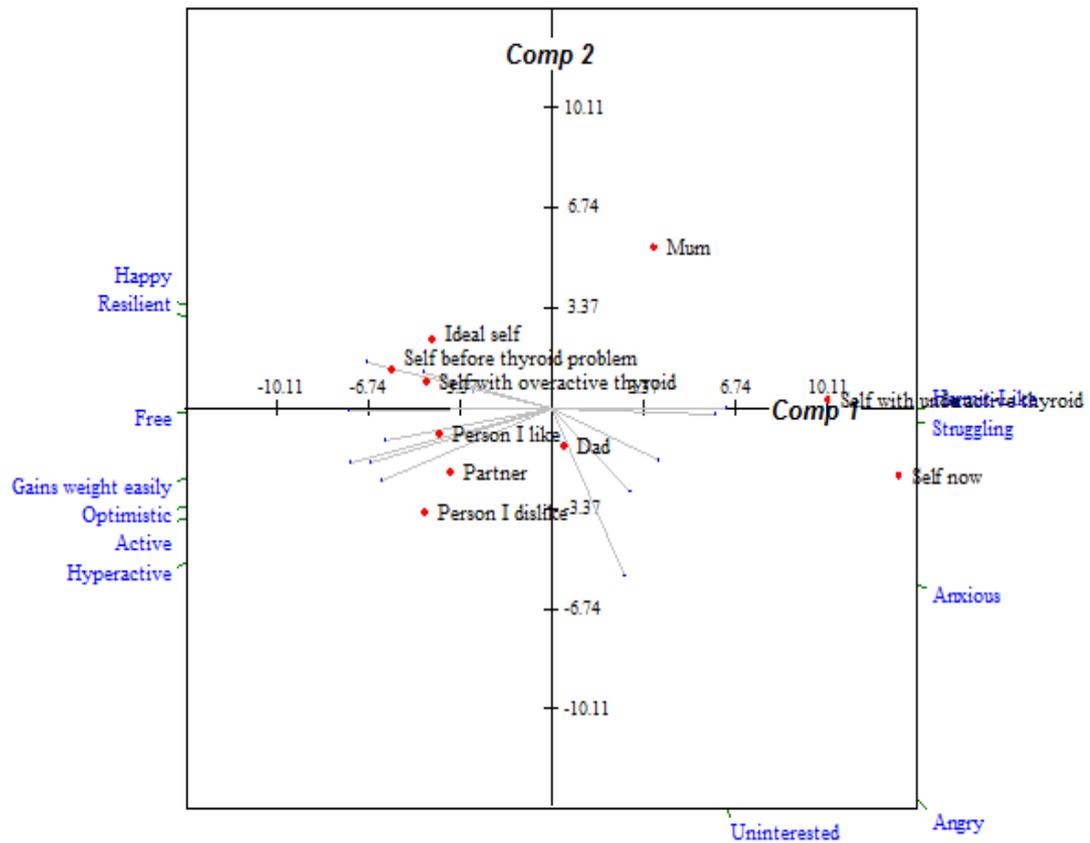
Mary's elicited constructs were as follows:

1. Active – Sedentary
2. Anxious – Balanced
3. Angry – Empathetic
4. Optimistic – Realistic

5. Uninterested – Caring
6. Free – Inhibited
7. Struggling – Coping
8. Resilient – Weak
9. Hermit-like – Sociable

The relationships between the elements and constructs were plotted graphically through the repertory grid software IDIOGRID and are displayed in Figure 26. The horizontal axis is the first principal component of the PCA (PC1) and the vertical axis represents the second principal component (PC2). The elements and constructs are plotted according to their loadings on these components. In Mary's repertory grid, the PC1 accounted for 74.2% of the variance and PC2 accounted for 11.13% of the variance, which indicates that Mary's construing was tightly structured. The further apart the elements are on the graph, the more dissimilarly they are viewed. It is notable that Mary viewed self now similarly to self with hypothyroidism and distant from ideal self. Mary viewed herself with hypothyroidism less favourably than herself before any thyroid problem. However, she viewed herself now as more distant from ideal self, compared with herself before any thyroid problem (relative distance of 1.31). Mary viewed herself now and self with hypothyroidism as closer to the construct poles of 'hermit-like', 'struggling' and 'anxious'. The self before hypothyroidism and self with an overactive thyroid are seen as similar to ideal self, which is close to 'happy' and 'resilient'.

**Figure 26. Idiographic representation of Mary's repertory grid**



The percentage sum of squares accounted for by the element self with hypothyroidism for Mary was 20.22%, indicating that this was an important element in her construct system. However, the constructs of 'lethargic-hyperactive', 'gains weight easily-doesn't gain weight easily' and 'depressed-happy' were not particularly superordinate in her construct system. Mary's repertory grid did not show any implicative dilemmas and the amount of conflict related to self with hypothyroidism was 18.4%, indicating that the constructs were applied differently to this element to the way in which they were applied to other elements.

### 3.6 Case example 2

A second case example will be presented in order to explore the relationship between construing and depressive and hypothyroid symptoms of an individual who scored low on the depression and hypothyroid symptom scales.

### *3.6.1 Background information for case example 2: Emma*

Emma (pseudonym) is a 58 year old, White British female who is working full time. She completed the grid online. She reported that she was back to completing the same activities/functioning as she was before she developed any thyroid problem and she does not have a history of depression. Emma noticed symptoms of, and was diagnosed with, hyperthyroidism in 1994 when she experienced weight loss, shaking, loss of sense of humour and nausea. She underwent RAI in 2004 and developed hypothyroidism approximately two months later. Emma reported feeling lethargic, short of breath and having pain in her upper limbs. She was diagnosed and started on thyroxine at the same time and is currently taking 100 mcg thyroxine. Emma does not have any other significant health problems.

### *3.6.2 Emma's questionnaires*

Emma scored 1 on the HADS depression subscale, indicating that she is not currently experiencing depression. She scored 21 for emotion-focused coping, 12 for problem-focused coping and 13 for dysfunctional coping, indicating that she uses more emotion-focused coping strategies in relation to the hypothyroidism. Emma reported experiencing 6 of 15 hypothyroid symptoms and her total symptom difficulty score was 8, which indicates that she is only a little bothered by the symptoms she experienced.

### *3.6.3 Emma's repertory grid*

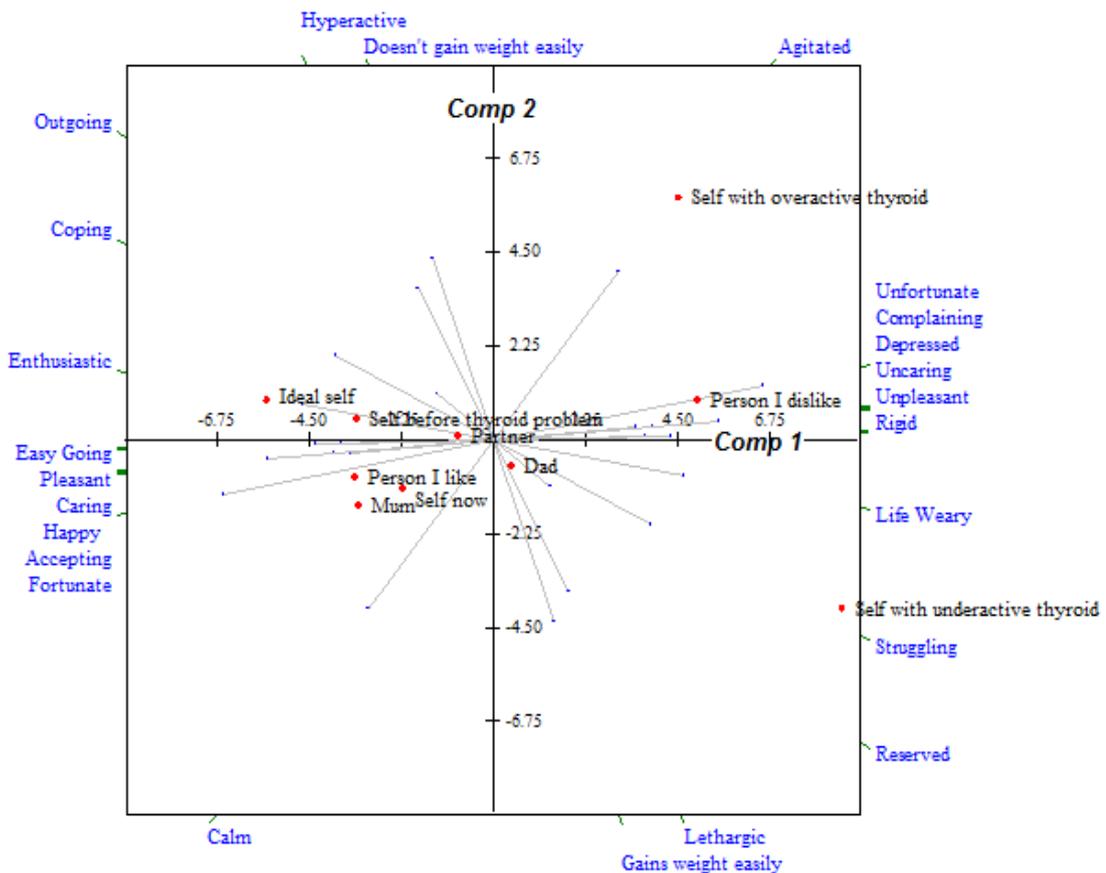
Emma's elicited constructs were as follows:

1. Fortunate – Unfortunate
2. Calm - Agitated
3. Accepting - Complaining
4. Reserved - Outgoing
5. Pleasant - Unpleasant
6. Caring - Uncaring
7. Coping - Struggling
8. Easy-going - Rigid

## 9. Enthusiastic – Life weary

Emma's graphical representation of the relationship between the elements and constructs can be seen in Figure 27. In Emma's grid, the PC1 accounted for 58.74% of the variance and PC2 accounted for 17.78% of the variance, which indicates that Emma had more than one viable dimension of construing. It is notable that Emma viewed self now dissimilarly to self with hypothyroidism and the self now was seen as similar to the ideal self. Emma's relative distance of self with hypothyroidism, compared to self before any thyroid problem, from the ideal self was 1.24, indicating that she viewed herself with hypothyroidism less favourably than herself before any thyroid problem. Emma viewed herself now as favourably as herself before any thyroid problem (relative distance of 0.12). Self with hypothyroidism was seen as close to construct poles of 'struggling' and 'life-weary'. The self with hyperthyroidism is closer to 'agitated' and 'unfortunate'.

**Figure 27. Idiographic representation of Emma's repertory grid**



The percentage sum of squares accounted for by the element self with hypothyroidism for Emma was 29.45%, indicating that this was an important element in her construct system. The constructs of lethargic-hyperactive, gains weight easily-doesn't gain weight easily and depressed-happy were not particularly superordinate constructs in Emma's construct system. No implicative dilemmas were found in Emma's grid and the amount of conflict related to self with hypothyroidism was 18.30%, indicating that constructs were applied differently to this element to the way in which they were applied to other elements.

## 4. DISCUSSION

### 4.1 Summary of the results

The study explored how patients with treated hypothyroidism construe their illness by examining the elements related to the self and the structure and content of the construct system. The relationships between these personal constructs and depression, coping and hypothyroid symptoms were then explored. The results will be summarised followed by the additional findings. The results will be discussed in relation to each hypothesis in accordance with the literature.

#### *4.1.1 The relationship between self construal and depression, coping and hypothyroid symptoms*

- The relative distance of self with hypothyroidism, compared with self before any thyroid disorder, from the ideal self was significantly and positively correlated with depression. This suggests that those who view the self before any thyroid disorder more favourably than self with hypothyroidism are more depressed. No significant correlations were found between this relative distance and the coping style or hypothyroid symptom frequency or difficulty.
- The relative distance of self now, compared with self before any thyroid disorder, from the ideal self was significantly and positively correlated with depression, dysfunctional coping, hypothyroid symptom frequency and hypothyroid symptom difficulty. This suggests that those who view the self before any thyroid disorder more favourably than the self now are more depressed, use more dysfunctional coping strategies and experience more hypothyroid symptoms and are more bothered by them. No significant correlations were found between emotion-focused or problem-focused coping and this relative distance.
- No significant correlations were found between the salience of the element self with hypothyroidism and depression, coping style or hypothyroid symptom scales.

- Those who construed the self now as similar to self with hypothyroidism were not significantly different from those who did not on depression or coping scores, hypothyroid symptom frequency and hypothyroid symptom difficulty.
- Those who identified the self now with a negative view of hypothyroidism were significantly more depressed, used more dysfunctional coping strategies and had more hypothyroid symptoms and were more bothered by these symptoms than those who did not. No significant differences were found between those who identified themselves with a negative view of hypothyroidism and those who did not in emotion-focused or problem-focused coping styles.

#### *4.1.2 The relationship between the structure of the construct system and depression, coping and hypothyroid symptoms*

- A significant positive correlation was found between the use of extreme ratings (polarized construing) and depression. No significant correlations were found between polarization of construing and coping style, hypothyroid symptom frequency and hypothyroid symptom difficulty.
- Tightness of construing was significantly and positively correlated with depression and hypothyroid symptom frequency. No significant correlations were found between tightness of construing and coping style and hypothyroid symptom difficulty.

#### *4.1.3 The relationship between the inconsistencies of the construct system and depression, coping and hypothyroid symptoms*

- There were no significant correlations between the inconsistencies in the construct system i.e. implicative dilemmas and percentage of conflict related to self with hypothyroidism and coping style or hypothyroid symptoms. There was a trend towards a significant positive correlation between the percentage

of conflict related to self with hypothyroidism and depression although the size of the correlation co-efficient size was modest.

- No significant differences were found between those patients with implicative dilemmas and those without implicative dilemmas in depression, coping style and hypothyroid symptoms

#### *4.1.4 The relationship between the content of the construct system and depression, coping and hypothyroid symptoms*

- A significant positive correlation was found between the superordinacy of the construct 'happy-depressed' and problem-focused coping, which suggests if the construct 'happy-depressed' is important to a patient, the more problem-focused coping strategies they use.
- Constructs on which the self with hypothyroidism was rated with an extreme score most commonly fell into the construct categories of emotion and physical health. The most used subcategory was 'introverted'.

#### *4.1.5 The relationship between dysfunctional coping and depression and hypothyroid symptom frequency and difficulty*

- Dysfunctional coping was significantly and positively correlated with depression, hypothyroid symptom frequency and difficulty.

#### *4.1.6 The relationship between history of depression and current depression, coping and hypothyroid symptom frequency and difficulty*

- Those who had a history of depression experienced significantly more hypothyroid symptoms than those patients without a history of depression. No significant differences were found between those with a history of depression

and those without in current depression, coping style or hypothyroid symptom difficulty.

#### *4.1.7 Additional findings*

- Predictors of depression

The best overall predictors of depression were relative distance of self now, compared with self before any thyroid problem, from ideal self, hypothyroid symptom frequency and use of dysfunctional coping strategies. These three predictors accounted for 82.9% of the variance.

- Predictor of hypothyroid symptom frequency

The best overall predictor of hypothyroid symptom frequency was depression. The model accounted for 47.9% of the variance.

- Predictors of hypothyroid symptom difficulty

Depression was also the best overall predictor of hypothyroid symptom difficulty. The model accounted for 49.7% of the variance.

- Themes of constructs

Overall, the most used categories of the constructs were emotional, relational and personal categories.

## **4.2 Discussion of the results in relation to the literature**

*4.2.1 Hypothesis 1a. The greater the relative distance of the self with hypothyroidism, as compared to the self before any thyroid problem, from the ideal self, the greater the number of hypothyroid symptoms and hypothyroid symptom difficulty, depression, and dysfunctional coping scores.*

The results confirm that the more favourably the individual construes the self before any thyroid disorder compared with the self with hypothyroidism, the more depressed the person is. This may suggest that people who view themselves with hypothyroidism more negatively than themselves before a thyroid problem are less adjusted to the disorder. As the patient is unable to return to a self before any thyroid disorder, this may create 'threat' and 'anxiety' (Kelly, 1955) as these patients are now living in a world where their constructs may not be as useful in anticipating the future. The results may also be related to the PCT transition construct of 'guilt', when the person may believe that they are not interacting with others in ways which are characteristic of them (Kelly, 1955). For example, a core role for a patient before developing a thyroid condition may have been to be 'strong'. However, symptoms of hypothyroidism may have caused the patient to feel unable to cope and therefore they may feel dislodged from their core role. This may feel like a loss of an authentic self. Skelley (2002) found that a larger distance between self now and self before a stroke was related to depression. However, he did not look at how favourably each was viewed, although Turpin et al. (2011) reported cancer patients construed the ideal self similarly to the pre-cancer self. The discrepancy between the self now and ideal self has been shown to be related to depression (Feixas et al., 2008) and therefore this result would be in accordance with the previous research.

No significant relationships were found with coping or hypothyroid symptom difficulty. This may be because of the small sample size. However, it may be that people view having hypothyroidism as a negative, acute experience, which is now in the past and current coping style, which was used in this study, may not adequately address this event. Schwarzer and Schwarzer (1996) suggested that coping is dynamic and changeable in different contexts and therefore there may have been different coping strategies employed when hypothyroidism was overt.

There was a trend in the data to suggest that the more favourably the individual construes the self before any thyroid disorder compared with the self with hypothyroidism, the greater the number of hypothyroid symptoms experienced currently ( $r_s = .346$ ,  $p = .067$ ). This may have been significant in a larger sample. This will be discussed in more detail in section 4.2.2. However, it may be that the more symptoms experienced currently, the more the person views self with hypothyroidism

as a current, negative experience and would therefore wish to be back to how they were before any symptoms occurred.

*4.2.2 Hypothesis 1b. The greater the relative distance between the construal of self now, as compared to the self before any thyroid problem, and the ideal self, the greater the number of hypothyroid symptoms, hypothyroid symptom difficulty, depression and dysfunctional coping scores.*

### Depression

The results confirm that the more favourably the individual construes the self before any thyroid disorder compared with the self now, the more depressed the person is. This may show that people who view themselves now more negatively than themselves before a thyroid problem are less adjusted to hypothyroidism. Interestingly, this was more strongly correlated with depression ( $r_s = .672$ ) than the previous relative distance involving self with hypothyroidism ( $r_s = .421$ ). Therefore, the identity of self now may be more important in the construct system for this sample. Many patients reported only experiencing a few hypothyroid symptoms for a short period before thyroid hormone levels were stabilised, which may suggest that they might not consider that they have hypothyroidism currently. Self with hypothyroidism might not be elaborated or, as Kelly (1955) described, the element might be outside the range of convenience of the person's constructs, i.e. the constructs are not as applicable to that element. The large changes in the way people construe the self before and after developing hypothyroidism could relate to a loss of self, as has been found in chronic health problems (Charmaz, 1983). Those people who construe larger changes in identity since developing a condition will be more likely to experience worse outcomes (Skelley, 2002). However, it may be that due to the current depression they are experiencing they view a past view of themselves more positively.

Interestingly, there were a group of people who viewed themselves now more positively than themselves before a thyroid disorder. This could be related to the response-shift phenomenon (Spranger & Schwartz, 1999), where patients have been able to amend values and constructions about important aspects of their life since

developing a thyroid disorder. These individuals had lower depression scores (HADS depression scale 4-6) although not as low as those who viewed the self now as favourably as self before any thyroid disorder. Therefore, although there may have been positive change in identity, they still experienced some symptoms of depression. One possibility may be that these depressive symptoms are related to biological mechanisms rather than psychological ones. It may also be that positive events have happened in their lives since developing a thyroid disorder as two of these people developed hyperthyroidism over 27 years ago. An alternative explanation may be that these patients are trying to find benefits where there may not be many. The process of trying to find benefits may lead to more distress, which would support Tomich and Helgeson's (2004) findings. This was a small group (n=3), however, and it is difficult to draw conclusions.

### Coping

The results also confirm that those people who view themselves now more negatively than themselves before a thyroid disorder used more dysfunctional coping strategies. This implies that these people may use strategies such as mental disengagement or avoidance, which stops them from moving to a sense of self beyond having a thyroid condition.

### Hypothyroid symptoms

The more positively patients viewed self before any thyroid disorder compared with self now, the greater the hypothyroid symptoms frequency and more difficulty with these symptoms. Previous repertory grid studies have shown that those people who construe themselves now as similar to self before a chronic health problem have better physical health outcomes (James & Large, 1992; Large & Strong, 1997; Skelley, 2002). It may be that people who have been unable to construct a positive view of the self now since developing a thyroid disorder notice more symptoms that fit with their view of having changed since developing hypothyroidism. Viewing hypothyroid symptoms as part of the self now rather than tied to a possible past self (self with hypothyroidism), could suggest that the disorder and symptoms become a way of life (Fransella, 1972). Although they are not seen positively, the symptoms could provide a way of predicting the world and to avoid invalidation and 'threat' to

core self construction. This may be why this correlation with frequency of hypothyroid symptoms was significant, compared with the relative distance using the element self with hypothyroidism seen in section 4.2.1, which was not significant. An alternative explanation is that because the person experiences hypothyroid symptoms they view a self without any of these symptoms (i.e. self before) more positively. The presence of hypothyroid symptoms may make it difficult to construe the self in any other way, such as recognising any personal characteristics which have remained unchanged since developing a thyroid disorder.

As stated previously, some people reported that they did not identify with having hypothyroidism as they no longer experienced symptoms when on adequate treatment. This may also be in line with Dickson et al.'s (2009) study, which found that hypothyroid patients were less concerned about their condition than CFS patients, although the sample used in this study had primary hypothyroidism. Groups were created in order to investigate whether those patients who viewed self now as similar to self with hypothyroidism had greater levels of depression and hypothyroid symptoms.

#### Exploratory groups related to identity

Interestingly, those who identified with having hypothyroidism were not significantly different from those who did not on depression scores, dysfunctional or emotion-focused coping or hypothyroid symptom frequency. Consequently, accepting the diagnosis as part of their identity does not mean the person will be depressed or experience more symptoms. This could be in line with Adams et al.'s (1997) findings that acceptance of diagnosis may be helpful, for instance in understanding the need for medication. There was a trend towards significance in that those who identified with having hypothyroidism had greater difficulty with the symptoms. It may be that having higher perceived difficult physical symptomatology means that an individual identifies more with hypothyroidism. There was also a trend that those who did not identify with having hypothyroidism used more problem-focused coping strategies. It could be that active coping strategies have helped the person do something about the symptoms, e.g. seeking advice, which led to a reduction in distress and led the person to construe self now as dissimilar to self with hypothyroidism. It could also be possible that construing the self with hypothyroidism as a separate, past experience

is an active coping strategy to protect the core self constructions from invalidation. However, the group sizes are small and therefore more detailed analysis on the impact of identity were not possible. Another possible alternative is that those who identify with having hypothyroidism may be less likely to feel the need to actively cope with the condition as they have accepted the condition as part of their identity.

As it was shown that identifying with hypothyroidism does not necessarily lead to difficulties for a patient, further analysis looked at the negativity of hypothyroidism and the identity of the patient. Those who identified with having hypothyroidism now and viewed this negatively used more dysfunctional coping strategies, were more depressed, and experienced more hypothyroid symptoms and difficulty with these symptoms than those who did not. This gives some support for the Pincus and Morley (2001) 'Schema Enmeshment Model' and Leventhal et al.'s (2001) hypothesis that if negative aspects of the illness are encapsulated with the self identity then the person experienced more depression. This is also in line with the research on illness representations (Hagger and Orbell, 2003; Leventhal et al., 1983), which highlights that the identity of the illness is related to coping styles and symptoms in a variety of physical health difficulties.

These results may also provide some support for Linville's (1987) hypothesis that when a negative event occurs, the self-aspect most related to the situation becomes activated. Negative thoughts and feelings attached to the event may become associated with the self-aspect. This negativity may 'spill-over' into other related self-aspects. Within this study, the negative aspects associated with the self with hypothyroidism identity may spill over into the self now identity.

*4.2.3. Hypothesis 1c: The more salient an individual's construing of self with hypothyroidism, the higher the depression, hypothyroid symptom frequency and hypothyroid symptom difficulty scores and dysfunctional coping scores.*

On the whole, this hypothesis was not confirmed. There was a trend towards higher depression scores in those people for whom this element was important in their construct system ( $r_s = .350$ ,  $p = .065$ ) and also towards the use of more dysfunctional coping strategies ( $r_s = .329$ ,  $p = .078$ ). These non-significant results may be due to a

small sample size. On the other hand, it might have been interesting to explore whether this element was more important than the self now element. As previously discussed, some people may construe self with hypothyroidism and self now differently. Therefore, looking at this element in isolation may have missed some important information. As Rosenberg and Gara (1985) suggest, the person may move temporarily to different self identities if one is threatened, e.g. switching from self now to self with hypothyroidism with the cyclical variation of the symptoms. Charmaz (1995) suggests that people may separate a view of the body from the view of the self as a normal part of adjustment. Therefore, it may be that people move to the self with hypothyroidism when the self now is under threat. As Linville (1987) suggests, having many multiple self aspects and viewing these differently buffers against stress-related illnesses and depression. Therefore, although self with hypothyroidism may have been superordinate for some people, other self aspects may have been equally important and construed differently, which may have buffered against depression and hypothyroid symptoms, reducing the impact of coping styles on outcome.

*4.2.4 Hypothesis 2a: Polarized construing would be positively correlated with higher depression, hypothyroid symptom frequency, hypothyroid symptom difficulty scores and dysfunctional coping style.*

Those patients who used more extreme ratings also had higher depression scores. This would be in line with Neimeyer (1983; 1985d), who suggests that severity of depressive symptoms is related to construing in this way. This could also be related to a black-and-white style of thinking from a cognitive-behavioural model (Beck et al., 1979). However, no other significant correlations were found with polarization of construing. This may have been due to lack of statistical power.

*4.2.5 Hypothesis 2b: The more tightly organised the construct system, the higher the scores of depression, hypothyroid symptom frequency, hypothyroid symptom difficulty and dysfunctional coping styles.*

The more tightly organised the construct system, the more hypothyroid symptoms the person experienced. This implies that the worse their condition is, the more tightly

organised the construing is. This may help protect the person from 'threat' to the core self construction, which would be invalidating. This would be in line with Fisher's (1985) study on amputees, where tightening of construing was a response to threat of diagnosis. This gives some support to the hypothesis that symptoms may become a predictable way of viewing the world but that that this is related to poorer prognosis (Button, 1983). Tightness of construing was related to depression, which is in line with the research (Sheehan, 1981). Tightness of construing may reduce the chances of new information permeating the person's construct system, which reduces the possibility of invalidation.

*4.2.6 Hypothesis 2c: Those who have more cognitive conflicts will experience more hypothyroid symptoms and more difficulty with these symptoms, be more depressed and use more dysfunctional coping styles.*

No significant correlations were found between the number or percentage of implicative dilemmas and depression, coping or hypothyroid symptoms. Sheehan (1981) found less conflict within the grids of depressive patients compared with non-depressed controls. Conflict in Sheehan's study was conceptualised as 'imbalanced triads', i.e. the correlations between three constructs are either all negative or two are negative and one is positive'. For example, an unsympathetic person was seen as childish and also as having found meaning in life, but a childish person has not found meaning in life. Sheehan (1981) suggested that a tightly organised construct system reduces incompatibilities such as these conflicts. Tightness of construing was found to be related to depression scores in this study and therefore this may account for this finding. There were very few implicative dilemmas in the sample ( $M = 1.05$ ,  $SD = 1.504$ ) and a small mean percentage of implicative dilemmas ( $M = 1.66$ ,  $SD = 2.35$ ). Implicative dilemmas were present in 40% of the sample, which is closer to the number expected in a control group sample than has been seen with fibromyalgia (Compan et al., 2011) or IBS (Benasayag et al., 2004 cited in Feixas & Saul, 2004). This may suggest that this group were relatively less conflicted compared to other physical health problems.

The percentage of conflict related to self with hypothyroidism was not found to be significantly correlated with hypothyroid symptoms or emotion-focused or problem-

focused coping. However, there was a trend towards higher depression scores when the percentage of conflict concerning self with hypothyroidism was higher ( $r_s = .336$ ,  $p = .056$ ) and also greater use of dysfunctional coping scores ( $r_s = .317$ ,  $p = .086$ ). This suggests that the greater the conflict in the element self with hypothyroidism, the more depressed the patient is. This conflict with the element may prevent it from becoming elaborated. Dysfunctional coping styles may contribute to a less elaborated element if the person used mental or behavioural disengagement, which prevented them from testing their predictions and constructions about having hypothyroidism. However, the correlations are modest. Alternatively, the lack of significant findings may be due to the Rosenberg and Gara (1985) hypothesis that this identity may have been used temporarily whilst symptoms were untreated. Therefore, the conflict related to the element self now may have a stronger relationship with current depression, hypothyroid symptoms and coping.

*4.2.7 Hypothesis 2d: The more superordinate the supplied constructs related to hypothyroidism are (i.e. lethargic-hyperactive, happy-depressed, doesn't gain weight easily- gains weight easily), the higher the depression, hypothyroid symptom frequency, hypothyroid symptom difficulty and dysfunctional coping scores.*

In general, this hypothesis was not confirmed. A significant correlation was found between the superordinacy of the 'happy-depressed' construct and problem-focused coping, which suggests that the more important the construct 'happy-depressed' is for the person, the more they use problem-focused coping. One possible explanation for this finding may be that being happy or depressed are more important because they have experienced being depressed in the past. Indeed, three participants with the largest percentage sum of squares for 'happy-depressed' had a history of depression. This construct might continue to be important as it may help the person be more aware of when their mood decreases and initiate problem-focused coping strategies to prevent their mood from worsening. However, this could be a spurious result due to the number of correlations performed. The reason for the lack of findings to support the hypothesis may be due to the fact that many people used their own constructs to describe their symptoms (e.g. 'tiredness-alert'). Elicited constructs may be more personally orientated and therefore more meaningful for the person than supplied constructs (Fransella et al., 2004). With the construct 'hyperactive-lethargic',

both poles may be undesirable, which could be described as a dilemmatic construct. Dilemmatic constructs do not offer a clear pathway of action (Feixas et al., 2009) and may be considered as a conflict. Of note, however, is that half the sample chose a number indicating they would prefer to be hyperactive rather than lethargic. It may be that these people did not experience hyperactivity as part of hyperthyroidism and therefore this might not be seen negatively or it may be that some level of energy is preferable to their current position of 'lethargic'. Button (1985) warns that verbal labels do not mean the same for each person, which was shown as people often used similar words (e.g. tiredness and lethargic) in different ways.

*4.2.8 Hypothesis 2e: The most common categories of constructs relating to the self with hypothyroidism will be physical health and emotional constructs.*

This hypothesis was confirmed as the self with hypothyroidism was rated in extreme terms in relation to physical health and emotional constructs. The high frequency of use of the physical category is in line with Compan et al.'s (2011) study on fibromyalgia. Physical illnesses may be difficult to make sense of and construing hypothyroidism in other ways, such as the impact it might have on relationships, might be threatening to the person's core self construction. This may also reflect the emphasis on the medical model in describing quality of life in terms of physical symptoms. The constructs of the medical profession may provide some capacity to anticipate the future and are therefore subsumed by the individual. Turpin et al. (2011) found that people adopted societal values in their personal constructions, which included a medical discourse. However, 13 people reported feeling depressed or low on the ThySRQ and this was reflected in the fact that emotion was the second most common category of constructs. This indicates that emotional aspects of hypothyroidism are important to consider. The results may be similar to Viney's (1989) 'images of illness' in that some of the emotional constructs related to self with hypothyroidism, i.e. moody, negative and miserable, could be seen as similar to Viney's depressive images. Viney (1989) also described social exclusion as a theme in the 'images of illness'. In this study, self with hypothyroidism was seen as reserved, inhibited and quiet, which might prevent the person from being more socially included.

Interestingly, one individual viewed the self with hypothyroidism as 'chilled' as opposed to 'erratic' and 'laidback' as opposed to 'uptight'. The opposite poles were used to describe themselves when they were hyperthyroid. Therefore, the person's experience of hyperthyroidism is likely to shape how they view having hypothyroidism. Caution should be taken when interpreting the results of the content analysis, though, as the percentage of agreement between the raters was 70.4%, which suggests that there may have been disagreements on a large proportion of the categorisations.

*4.2.9 Hypothesis 3: It is hypothesised that higher dysfunctional coping will be related to higher depression and hypothyroid symptom difficulty scores.*

These hypotheses were confirmed, including a particularly strong relationship between dysfunctional coping and depression ( $r_s = .824, p < .001$ ). This may suggest that avoidance styles of coping predict depression scores. These results are in line with the research on coping generally (Taylor & Stanton, 2007) and that behavioural disengagement has been found to be related to increased fatigue (Ray et al., 1995). However, individual items were not extracted and therefore other types of dysfunctional coping may be responsible for these relationships.

*4.2.10 Hypothesis 4: The higher the depression score, the greater the number of hypothyroid symptoms and hypothyroid difficulty score.*

Significant and strong correlations were found between depression and hypothyroid symptom frequency and difficulty. It may be that the presence of hypothyroid symptoms may lead a person to feel more depressed. It may also be that depression increases the focus on bodily sensation, and makes the person more aware of physical symptoms (Stegen et al., 2001; Hou et al., 2008). It may be that both processes are occurring and reinforcing each other. It is interesting that this was independent of the perception of how much the symptoms bothered the participants. The more a person is bothered by hypothyroid symptoms, the more depressed they are. However, it may be that due to the negative bias of perception associated

with depression (Beck et al., 1979), the person is more likely to experience the physical symptoms as difficult.

*4.2.11 Hypothesis 5: Those with a history of depression will have higher depression and symptom difficulty scores, greater number of hypothyroid symptoms and greater use of dysfunctional coping strategies.*

Those with a history of depression had significantly more hypothyroid symptoms currently than those without a history of depression. This may mean that previous depression may predispose someone to experience more difficulty when changes occur in the person's health. It may be that there is still a propensity to attend to bodily symptoms and notice these more as previously discussed. There was a trend towards those with a history of depression having higher current depression scores ( $z = 1.373, p = .089$ ). The lack of significance may be due to the small group sizes. This trend would be in line with Coyne et al. (1999), where previous depression may predict current depression. Alternatively, five of the six participants who had a history of depression developed this when they were hyperthyroid, which may mean that some individuals may be especially dependent on thyroid hormone levels for psychological well-being as suggested by Engum et al. (2005). It should also be noted that there was a trend for those with a history of depression to use more problem-focused coping (median = 16) than those without a history of depression (median = 10) ( $z = 1.655, p = .098$ ). This might also support Park et al.'s (2001) goodness-of-fit hypothesis of coping as the person with a history of depression may try to use more problem-focused coping strategies for a disorder where they could struggle to reduce persistent symptoms. This may lead to higher current depression. However, the small group sizes mean that the results should be interpreted with caution.

Emotion-focused coping was unrelated to any of the other variables. Increased use of problem-focused coping strategies was related to the 'happy-depressed' construct being more important and a significantly greater use of problem-focused strategies was found for those participants who identified with hypothyroidism and those participants with a history of depression. The lack of positive findings would be in line with the research, which has suggested that these domains of coping are too

simplistic (Carver et al., 1989) and are context-dependent (Schwarzer & Schwarzer, 1996).

#### *4.2.12 Additional findings: Predictors of depression and physical symptoms*

The exploratory multiple regression analyses for depression showed that how unfavourably a person construes the self now compared to before a thyroid disorder predicted depression scores. This remained significant and was the best predictor even with the inclusion of the variables dysfunctional coping and hypothyroid symptom frequency. The final model accounted for 82.9% of the variance. Therefore, the way a person construes the self following a thyroid disorder can influence the experience of depressive symptoms. This finding offers support for the model of coping with illness proposed by Maes et al. (1996) that an individual's appraisal of the demands of a particular illness and coping behaviour are discrete and important variables in adjustment.

However, measures of construing and of the construct system were not significant predictors of hypothyroid symptoms or hypothyroid symptom difficulty. In both these models the only significant predictor was depression. Therefore, it may be that those who experience depression are more likely to experience difficulty with hypothyroid symptoms and experience a greater number of hypothyroid symptoms. The inclusion of depression in the model led to the non-significance of dysfunctional coping as a predictor variable, possibly because the two variables are interrelated. This could suggest that depression accounts for the impact of dysfunctional coping and may therefore be a mediator of the experience of hypothyroid symptoms. However, further research would be needed to test this, i.e. splitting the group into low and high depression scores and looking to see if there is a difference in the number of hypothyroid symptoms experienced.

#### *4.2.13 Additional findings: Content analysis*

As discussed, in relation to hypothesis 2e, physical health was the most used category of constructs applied in an extreme way to self with hypothyroidism.

However, this was not the most used category when the overall content of the construct system was explored. This may show that physical health constructs can be restricted to particular identities. Emotion was the most common category of constructs used in the whole repertory grid, which may highlight how important emotions are for hypothyroid patients.

Constructs related to the relational category, i.e. descriptions of types of relationships with others, were the second most common, accounting for approximately 22% of the overall constructs, which highlights the importance of how illness may impact the construal of relationships with others. Again, caution should be exercised with these interpretations due to the relatively low rate of agreement in categorisation of constructs.

### **4.3 Limitations of the study**

#### *4.3.1 Design limitations*

Due to time constraints, the study used a cross-sectional correlational design, which limits the interpretations that can be made from the results. Although exploratory analyses were conducted to investigate predictors of depressive and hypothyroid symptoms, these must be interpreted cautiously due to the lack of statistical power.

The cross-sectional design also means that it was not possible to study construing over the course of the disorder, which may have changed. Retrospective accounts of self before any thyroid disorder will be viewed through the individual's current experiences. Therefore, those who may be struggling more may view the self before any thyroid disorder in a more positive light than it may have been. However, it would not be possible to examine constructs before developing hyperthyroidism. It may be that a person may believe that they deserve having a chronic condition and the diagnosis of a thyroid disorder may validate their view of the world. This may mean that they did not have a particularly positive view of the self before developing a thyroid disorder.

#### *4.3.2 Sample limitations*

Due to time constraints on the study, it was not possible to obtain a larger sample size. This limited the statistical power in detecting significant relationships between variables or differences between groups. A drawback of the study was the use of two recruitment locations. Analyses showed that there were significant differences between these groups as those recruited from the support groups had higher depression and dysfunctional coping scores and used less emotion-focused coping strategies than those recruited through the endocrinology clinic. Therefore, this may have been a confounding factor although the sample size was too small to split into these groups to test the hypotheses. On the other hand, the groups did not differ on number of hypothyroid symptoms experienced or how much they were bothered by these symptoms, which may indicate a degree of similarity in severity of illness. Those who were recruited through the endocrinology clinic, however, had been diagnosed with hypothyroidism more recently (median = 14 months) than those who were recruited through the support groups (median = 54 months). Although this was not a significant difference, this may have been due to small group sizes. It may be that those recruited through the endocrinology clinic experienced residual hypothyroid symptoms for a shorter period, which may have been less debilitating or they may believe that they will disappear with time. Milliken and Northcott (1996) suggest 'validation' of hypothyroidism may be seen as receiving the correct diagnosis and successful treatment. Those people in support groups have not been validated by a reduction in symptoms over the course of having hypothyroidism, which may lead to worse outcomes or less helpful attempts to cope with the condition. They also suggest that support groups provide validation for people who may be more socially isolated or less validated by the medical profession and friends and family.

Similarly, there was a significant difference between those who said that they were partly back to functioning at their normal levels and those who said that they were back to their normal level of functioning after developing hypothyroidism. Seven patients reported that that they were partly functioning and six of these were recruited through the support groups. Therefore, it may be that those people within the support groups find that the symptoms affect their functioning more. This may lead to dysfunctional and emotion-focused coping strategies and higher levels of depression, which may also affect their functioning. Williamson (1998) found that restricted

activity accounted for a significant amount of the variance in depressive symptoms in chronic health problems. However, this study only used one question as a measure of functioning, which is not robust, and therefore this result should be interpreted with care.

There may also have been a bias in the sample recruited from the endocrinology clinic as 71.4% of the sample had a co-morbid health condition as opposed to 30.8% of the support group sample. Although there were no significant differences between those with other health problems and those with a single diagnosis of hypothyroidism, it may be difficult to assess whether the persistent physical symptoms or depressive symptoms may be due to hypothyroidism or other conditions such as diabetes or anaemia. The inclusion of patients with co-morbid health conditions means that the sample may more accurately reflect patients seen in endocrinology clinics. However, it also means that it is difficult to attribute the findings to secondary hypothyroidism. The sample may also have been biased as there were only two men in the study. Women have been shown to have higher rates of depression and autoimmune thyroid disease (Whybrow, 1995), which may mean that the sample may be less generalisable to men with secondary hypothyroidism. Similarly, the results may not be applicable to patients from different ethnic backgrounds or cultures other than White British.

#### *4.3.3 Methodological limitations*

The study relied on people knowing accurate information about the inclusion criteria, i.e. whether they had subclinical hypothyroidism (i.e. raised TSH level but normal T4 level). Many of the participants did not know their blood test results, which indicated that they might not know if they had subclinical hypothyroidism. It may be possible that some participants had subclinical hypothyroidism or even subclinical hyperthyroidism, which may have accounted for the symptoms. Haggerty and Prange (1995) found that depression was associated with both overt and subclinical hypothyroidism. T4 and T3 levels were not available for the majority of the participants and this lack of knowledge makes it difficult to know the extent that biological mechanisms are contributing to persistent symptoms.

Collecting data on the use of antithyroid drugs and experience of RAI treatment when the person was hyperthyroid would also give more information about the person's experience of hyperthyroidism. Although length of time with a thyroid disorder was not found to be a significant factor in later difficulties, each person has an individual journey from hyperthyroidism through to euthyroidism and better periods of health. At every stage, there may be subtle factors which can help or hinder adjustment as Ettore (2006) describes in an autoethnographical account of hyperthyroidism. For instance, the fear of death from cardiac difficulties may also have been very real for some patients with severe hyperthyroidism and this was not explored fully. Therefore, the psychological impact of acute illness symptomatology has been less well explored (Ettore, 2006) and may well impact on the chronicity of conditions.

Participants were not asked about the different types of medication they may be on currently, i.e. T3 and T4 replacement or natural forms of thyroid hormone such as Armour. It may be that different medications may contribute to level of residual symptoms (Bunevicius et al., 1999). The study also did not ask about the different reasons for initially developing hyperthyroidism e.g. Graves' disease or benign tumours. It may also be possible that the autoimmunity involved in Graves' disease was persisting as thyroid antibodies have been found to be related to stressful life events (Bunevicius & Prange, 2006; Fukao et al., 2003), which may have led to subtle changes in thyroid hormones, which may be contributing to a patient's difficulties. It may also have been helpful to enquire about any stressful life events or daily hassles, which may have accounted for difficulties in adjustment.

Limited support was available for those participants who completed the repertory grid online. This can be seen as one person used 'happy' as a pole of a construct three times. This would suggest that happiness for this person is entwined with a number of other constructs and therefore it would have been better to discuss with the person what the opposite of 'happy' was to uncover the meaning for the person. One grid had a total of 11 constructs rather than 12 as they only supplied 8 constructs instead of 9. This may make it difficult to compare to other repertory grids as the Principal Component Analysis reduces the number of elements and constructs into a lesser number of hypothetical components. Therefore a reduced number of variables, i.e. constructs, would decrease the number of components. However, the participant was included in the study as excluding them would have reduced the sample size further.

The rate of agreement of 70.4% between judges on the classification of constructs may suggest that there is a moderate rate of disagreement. This is lower than stated for the CSPC (Feixas et al., 2002) possibly due to the lack of training in use of the system. This lower rate of agreement also highlights that ratings of constructs are based on the judge's construct system i.e. that one person may view a construct about 'fun' as personal and the other may view this as relational depending on their view of the world. As can be seen in the example above, some constructs such as 'happy-lethargic' do not easily fit into one category of the CSPC whereas other construct content analysis systems such as Landfield's (1971) system separates the construct poles before categorisation. However, the CSPC is more aligned to PCT, where constructs are seen as bipolar. Although the construct 'happy-lethargic' may be difficult to make sense of in a research setting, this information may be useful to explore with this patient as it appears that happiness may be tightly bound with feeling less tired. Working to explore this further may help this person to have a more elaborated view of 'happiness'.

It may have been difficult for some people to discriminate between different thyroid conditions as there were some patients who experienced the same symptoms when they were hyperthyroid as they did when they were hypothyroid (e.g. feeling tired, hair loss). It may have been that these patients did not experience as much disruption in their adjustment as someone who experienced opposite symptoms. However, there were too few participants to create groups to examine this.

The hypothyroid symptom difficulty score of the ThySRQ was created for each person by totalling the number of how much the person was bothered by the symptom. This lost important data about which symptoms caused the most difficulty to participants. This 'total' symptom bother score was not fully supported as a factor analysis indicated three of the symptoms had low item loadings. It has not been fully evaluated in studies of the reliability and validity of the ThySRQ data (McMillan et al., 2008) and therefore the outcome of using this variable should be treated tentatively.

Measurement of depression used a self report measure and as Freedland and Carney (2008) point out, this can inflate the score. However, the individuals' experience of depression was in keeping with a study which explored individuals' experience of hypothyroidism. Self report on all measures may have led to biases

due to social desirability. For example, although patients recruited from the endocrinology clinic were assured confidentiality, they may not have reported symptoms to someone connected with the endocrinologist involved in their care.

An important variable of anxiety was not explored in this study although it has been shown to be related to overt and treated hyperthyroidism and hypothyroidism. Development of a chronic condition in itself may be anxiety-provoking. In people with mental health problems, the presence of anxiety has been found to be related to more tightly organised construct systems (Bannister, 1962) and people with anxiety have been found to construe themselves differently from their ideal self (Ryle and Breen, 1972c). Consequently, anxiety may be a confounding factor as it may also impact the meaning-making in hypothyroidism.

Finally, it should be noted that Type 1 errors may have occurred in the study due to the multiple significance tests used in the analysis. A higher alpha level could have been applied, leading to a more stringent criterion for significant results.

#### **4.4 Clinical Implications**

It is important to take into account the way the person construes themselves with hypothyroidism, as this may impact on physical and mental health symptoms. However, it is also important to consider that having a chronic disorder may impact on the way a person may construe themselves. Some patients may experience persistent symptoms and need psychological support in coping with and adjusting to this.

Personal Construct Therapy could help the individual to build a better understanding of the opposite of the symptom. For example, if a person is 'depressed', it may be helpful to think about what it is to be 'happy', if that is the opposite. Personal Construct Therapy could also explore alternative constructs related to the self that, for example, may be less related to the presence of symptoms. This could include exploring constructs related to the self, which have been unaffected by having the disorder or investigating new ways of construing the self (Neimeyer & Winter, 2006). This could develop a more elaborated construction of the self and the individual's

view of the world that is less tightly organised and more permeable to new information. This would allow the individual to find other ways of anticipating the world, rather through the lens of the symptoms.

Interventions which explore differences in the way the individual may construe the self now and the self with hypothyroidism could be beneficial for those who identify with a negative view of hypothyroidism. Having more differentiated identities may reduce the 'spill-over' effect of negative associations with the condition into other self identities (Linville, 1987).

Dysfunctional coping was shown to be an important factor in whether people experienced persistent hypothyroid symptoms and depression. Interventions such as those involving graded activity and mental engagement have been shown to be effective with CFS patients (Deale, Chalder, Marks & Wessely, 1997). Further research could investigate if this would be helpful for people with hypothyroidism.

As depression was seen to be a significant predictor of hypothyroid symptoms, and those with a history of depression had more hypothyroid symptoms, it would be especially important to follow up these patients more closely and provide further support.

It may be that both physical symptoms and depression in treated secondary hypothyroidism have both biological and psychological antecedents, which may be mutually reinforcing. Detweiler-Bedell et al. (2008) emphasize the need to integrate depression and disease management rather than treating them as separate entities. For example, they suggest addressing the perceptions of the illness and illness identity; behavioural responses, such as increasing engagement in activities the person enjoys but that the person will be able to achieve given their illness; and ensuring the social functioning of the person is optimised including encouraging significant others to support the person in mood and disease management.

As Milliken and Northcott (1996) and Watt et al. (2007) note, the focus of primary care physicians may conflict with that of hypothyroid patients and may lead to invalidation. G.P.s should have access to information about the personal experience of the condition and help patients to access psychological support if necessary.

#### **4.5 Suggestions for future research**

Further research would benefit from a larger sample size to increase the statistical power. This could also allow for firmer conclusions to be drawn from statistical models. A larger sample could also mean that more males could be recruited and comparisons between genders could also be explored. Further research could also explore whether construing of the condition and coping styles differ in ethnic minority groups. A sample from only one source or enough participants to statistically compare samples from a clinic or through support groups might also mean that the results would be more robust. It may also be interesting to investigate how these patients may differ from another group of patients with similar symptoms such as CFS.

The impact on functioning may well be a significant variable, which was not explored in this study and the use of reliable and valid measure of functioning may uncover other predictors of depression. The inclusion of measures of quality and quantity of social support could provide useful information on the impact of social support on persistent difficulties as previous research has highlighted social support as a buffer against distress in physical disease (Cohen, 1988). Obtaining information on thyroid hormone levels would mean that both psychological and biological factors could be explored as predictors of persistent symptoms. Further research could also assess which particular coping strategies may be more or less helpful for a person with secondary hypothyroidism.

Exploring how people construe themselves in relation to others may show how socially isolated people view themselves to be. Feixas et al. (2008) found that depressed individuals saw themselves now as different from others, which might suggest that they are socially isolated and they also found that people viewed others differently from their ideal self, which would suggest that their tendency to negativity extends to the view of others. However, when they compared this to individuals with a diagnosis of Adjustment Disorder, only the discrepancy between the view of the self now and ideal self was found. Therefore, extensive negative construal within the individual's construct system may distinguish between someone with a depressive disorder and someone adjusting to an event. Existing research such as studies conducted by James and Large (1992) and Winter (1997) has shown that how

significant others construe the person with a long-term health problem is related to health improvements. Thus, asking significant others to complete repertory grids in relation to hypothyroidism could uncover interesting information, which may affect adjustment.

Measurement of the construct system, depression and coping before patients receive RAI treatment could assess if any of these factors are predictors of persistent physical symptoms or depression if the person develops hypothyroidism. A longitudinal study could also provide information about how patients' construing changes the course of the condition.

#### **4.6 Conclusions**

The hypotheses of the study included exploring the relationship between how an individual appraises or construes having hypothyroidism and depression, coping and hypothyroid symptoms. It was found that the way a person construes themselves with hypothyroidism was related to poorer mental health outcomes, i.e. depression, and poorer physical health outcomes, i.e. hypothyroid symptoms. Tighter and polarized construing was also found to be related to poorer outcomes as was dysfunctional coping style. Depression and hypothyroid symptom frequency and difficulty were strongly related and those with a history of depression had a greater number of hypothyroid symptoms. The results give evidence that psychological factors are important in the experience of secondary hypothyroidism. However, the study was limited by the cross-sectional correlational design, which does not allow firm conclusions to be drawn on the cause and effect of the persistent difficulties patients can suffer with. Although it is not clear from this study whether continued difficulties with depression and physical symptoms in secondary hypothyroidism are due to complex biological mechanisms even though the patients are clinically euthyroid, it seems that the way in which people construe or make sense of the illness and the coping strategies they employ are important areas for further research.

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**Appendix A: DEMOGRAPHIC AND MEDICAL INFORMATION**

1.	<b>Age</b>	
2.	<b>Gender</b>	
3.	<b>Ethnicity</b>	
4.	<b>a. Employment</b>	Full time/part time/none/student
	<b>b. Activity/Functioning</b> Are there any activities or functions that you can't do because of hypothyroidism? Are you back to you doing the same activities/functioning as you were before you developed any thyroid disease problem?	
5.	<b>Social support</b> Do you have friends, family or work colleagues who you consider supportive?	
6.	<b>Do you have a history of depression?</b> -When did this start? -Did you receive any treatment and was it successful?	
7.	<b>Rough date of noticing hyperthyroid symptoms</b>	
8.	<b>What were the symptoms?</b>	
9.	<b>Rough date of diagnosis of hyperthyroid symptoms</b>	
10.	<b>Rough date of radioiodine treatment</b>	
11.	<b>Rough date 1<sup>st</sup> noticed hypothyroid symptoms</b>	
12.	<b>What were the symptoms?</b>	
13.	<b>Rough date diagnosed with hypothyroidism</b>	
14.	<b>Rough date you started thyroid replacement hormone (TRH) (if different from date of diagnosis)</b>	
15.	<b>Has your medication for hypothyroidism changed since first given? If so, when and to what dosage?</b>	
16.	<b>What is your current dosage of thyroid replacement hormone?</b>	
17.	<b>If you know your last blood test level of T4, T3 or TSH please write them here</b>	
18.	<b>Please state if you have any other significant physical health problems</b>	

**APPENDIX B**

Chart 1 – Hospital Anxiety and Depression Scale

This questionnaire will help your physician to know how you are feeling. Read every sentence. Place an “X” on the answer that best describes how you have been feeling during the LAST WEEK. You do not have to think too much to answer. In this questionnaire, spontaneous answers are more important.

- |  |   |
|--|---|
| A 1) I feel tense or wound up:<br>3 ( ) Most of the time<br>2 ( ) A lot of the time<br>1 ( ) From time to time<br>0 ( ) Not at all   | A 9) I get a sort of frightened feeling like butterflies in the stomach<br>0 ( ) Not at all<br>1 ( ) Occasionally<br>2 ( ) Quite often<br>3 ( ) Very often  |
| D 2) I still enjoy the things I used to enjoy<br>0 ( ) Definitely as much<br>1 ( ) Not quite so much<br>2 ( ) Only a little<br>3 ( ) Hardly at all   | D 10) I have lost interest in my appearance<br>3 ( ) Definitely<br>2 ( ) I don't take so much care as I should<br>1 ( ) I may not take quite as much care<br>0 ( ) I take just as much care as ever |
| A 3) I get a sort of frightened feeling as if something awful is about to happen<br>3 ( ) Very definitely and quite badly<br>2 ( ) Yes, but not too badly<br>1 ( ) A little, but it doesn't worry me<br>0 ( ) Not at all | A 11) I feel restless, as if I had to be on the move<br>3 ( ) Very much indeed<br>2 ( ) Quite a lot<br>1 ( ) Not very much<br>0 ( ) Not at all  |
| D 4) I can laugh and see the funny side of things<br>0 ( ) As much as I always could<br>1 ( ) Not quite as much now<br>2 ( ) Definitely not so much now<br>3 ( ) Not at all  | D 12) I look forward with enjoyment to things<br>0 ( ) As much as I ever did<br>1 ( ) Rather less than I used to<br>2 ( ) Definitely less than I used to<br>3 ( ) Hardly at all                     |
| A 5) Worrying thought goes through my mind<br>3 ( ) A great deal of the time<br>2 ( ) A lot of the time<br>1 ( ) From time to time but not too often<br>0 ( ) Only occasionally  | A 13) I get sudden feeling of panic<br>3 ( ) Very often indeed<br>2 ( ) Quite often<br>1 ( ) Not very often<br>0 ( ) Not at all   |
| D 6) I feel cheerful<br>3 ( ) Not at all<br>2 ( ) Not often<br>1 ( ) Sometimes<br>0 ( ) Most of the time   | D 14) I can enjoy a good TV or radio program or book<br>0 ( ) Often<br>1 ( ) Sometimes<br>2 ( ) Not often<br>3 ( ) Very seldom  |
| A 7) I can seat at ease and feel relaxed<br>0 ( ) Definitely<br>1 ( ) Usually<br>2 ( ) Not often<br>3 ( ) Not at all   |   |
| D 8) I feel as I am slowed down<br>3 ( ) Nearly all the time<br>2 ( ) Very often<br>1 ( ) Sometimes<br>0 ( ) Not at all  |   |

**Appendix C: ThySRQ**

## ThySRQ

This questionnaire asks you about symptoms that can be associated with underactive thyroid. You might have experienced some of these symptoms in recent weeks.

For each question, you will find two parts:

for part (a) put an "X" in the box  to indicate if you have had the symptom in recent weeks, regardless of the cause;

for part (b) put an "X" in the box  to indicate how much the symptom has bothered you. ONLY answer part (b) if you answered "yes" to part (a).

1 (a)	Have you felt tired in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

2 (a)	Have you gained weight in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input checked="" type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

3 (a)	Have you felt colder than other people in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

4 (a)	Have you had constipation in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

5 (a)	Have you had hair problems in recent weeks (e.g. hair loss, coarseness)? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

6 (a)	Have you had skin problems in recent weeks (e.g. dryness, coarseness)? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

7 (a)	Have you had nail problems in recent weeks (e.g. brittleness, flaking)? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

8 (a)	Have you had loss of appetite in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

9 (a)	Have you had hearing problems in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

10 (a)	Have you had voice problems in recent weeks (e.g. hoarseness, huskiness)? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

11 (a)	Have you had speech problems in recent weeks (e.g. slowness, inaccuracy)? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

12 (a)	Have you had memory problems in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much have these bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

13 (a)	Have you had difficulty concentrating in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

14 (a)	Have you felt dizzy or lightheaded in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

15 (a)	Have you felt depressed or low in recent weeks? No <input type="checkbox"/> If no, go to next symptom Yes <input type="checkbox"/> If yes, complete (b)
(b)	If yes, how much has this bothered you? <input type="checkbox"/> not at all <input type="checkbox"/> a little <input type="checkbox"/> moderately <input type="checkbox"/> a lot

Thank you for completing this questionnaire.

**APPENDIX D**

**Brief COPE Questionnaire (Carver, 1997)**

These items deal with ways you've been coping with the stress in your life since you found out you had hypothyroidism. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

- 1 = I haven't been doing this at all**
- 2 = I've been doing this a little bit**
- 3 = I've been doing this a medium amount**
- 4 = I've been doing this a lot**

1. I've been turning to work or other activities to take my mind off things.	
2. I've been concentrating my efforts on doing something about the situation I'm in.	
3. I've been saying to myself "this isn't real."	
4. I've been using alcohol or other drugs to make myself feel better.	
5. I've been getting emotional support from others.	
6. I've been giving up trying to deal with it.	
7. I've been taking action to try to make the situation better.	
8. I've been refusing to believe that it has happened.	
9. I've been saying things to let my unpleasant feelings escape.	
10. I've been getting help and advice from other people.	
11. I've been using alcohol or other drugs to help me get through it.	
12. I've been trying to see it in a different light, to make it seem more positive.	
13. I've been criticizing myself.	
14. I've been trying to come up with a strategy about what to do.	
15. I've been getting comfort and understanding from someone.	
16. I've been giving up the attempt to cope.	
17. I've been looking for something good in what is happening.	
18. I've been making jokes about it.	
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	
20. I've been accepting the reality of the fact that it has happened.	
21. I've been expressing my negative feelings.	
22. I've been trying to find comfort in my religion or spiritual beliefs.	
23. I've been trying to get advice or help from other people about what to do.	
24. I've been learning to live with it.	
25. I've been thinking hard about what steps to take.	
26. I've been blaming myself for things that happened.	
27. I've been praying or meditating.	
28. I've been making fun of the situation.	

*Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. International Journal of Behavioral Medicine, 4, 92-100.*

## APPENDIX E

### INFORMATION ABOUT THE RESEARCH PROJECT

Version 2, Date: 30/09/10

My name is Sarah Patient and I am a third year trainee clinical psychologist at the University of Hertfordshire. As part of my training I have to do a research project. I am interested in your patient's view of themselves with hypothyroidism following treatment for hyperthyroidism and how this relates to symptoms of depression, symptom difficulty and coping styles. Currently there is less research focusing on the psychological factors contributing to depression and symptom difficulty in hypothyroidism.

#### **Who can participate?**

I am looking for people with a diagnosis of hypothyroidism who:

- Developed hypothyroidism as a result of receiving radioiodine treatment for hyperthyroidism.
- Have had stable thyroid function tests for the past three months following receiving thyroid replacement hormone.
- Are between the ages of 18 and 65 years old.

#### **Why is this research important?**

I am hoping that this research will inform clinicians practice and understanding about the factors which maintain symptoms of hypothyroidism, including depression. This research may highlight the influence of specific views of patient's have of themselves, which maintain symptoms of hypothyroidism. This could have several benefits including:

- Using the information to identify patients who may benefit from psychological interventions to improve these symptoms.
- Increasing health professionals understanding of the personal impact of having hypothyroidism and hyperthyroidism on their view of themselves and the world.

#### **What would participation involve?**

Participants would be asked to take part in a semi-structured interview, which involves asking some set questions but also new questions based on the participants answer. This will take place in a confidential setting on an NHS site. The interview will be confidential, it should take approximately an hour and a half and it will involve asking clients about the way they view themselves and other people in their life. Participants will also be asked to complete questionnaires in relation to depression, symptom difficulty and coping styles. Participants will be required to sign an informed consent form stating that if there are any issues of risk concerns about their mental health then I will need to contact their G.P. in order to discuss them. If they require immediate support, I have informed the participant that I will need to accompany them to the Accident and Emergency department at Lister Hospital. The informed consent form will also state that they have a right to withdraw at any time from the research and the contact details of the researcher will be on the form. Following the interview participants will be given the opportunity to debrief about the interview and to ask any questions of the researcher. If it is not possible to complete the research in

one session, the participant's travel expenses will be reimbursed if they need to make an additional trip.

This study has been approved by the Cambridgeshire 3 Research Ethics Committee. The Research Ethics Committee is an independent body whose role is to ensure that research is conducted in a safe and ethical manner. The research design has also been formally peer reviewed by the University of Hertfordshire's Doctoral Programme in Clinical Psychology.

In the event that something does go wrong and the patient is harmed during the research and this is due to someone's negligence then they may have grounds for a legal action for compensation against University of Hertfordshire but they may have to pay their legal costs. The normal National Health Service complaints mechanisms will still be available.

If you are interested in finding out more, or if you may know some patients who would like to take part, then I would be very happy to hear from you. I can then discuss this with you and, if the client has highlighted an interest in taking part, I will then provide more information to the client about the study before they consent to take part.

My contact details are:

.....

Many thanks, Sarah.

## Appendix F: PARTICIPANT INFORMATION SHEET

Version 2, Date: 27/09/10

Hello,

My name is Sarah Patient and I am a third year trainee clinical psychologist at the University of Hertfordshire. As part of my training I have to do a research project. I am writing to you because I am interested in your experience of having a thyroid disorder and I hope that you might be willing to take part in my research project which is called:

### **Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment**

Currently there is little research focusing on how people who have hypothyroidism view themselves with a thyroid disorder, both under- and over-active and how this affects their view of the world. The project aims to better understand how these views might be related to depression and symptom difficulty. The project will also look at how people cope with having a thyroid disorder. It is hoped that this project will increase professionals understanding of the psychological factors involved in hypothyroidism and that it will improve their work in this area.

### **What would participation involve?**

You would be asked to take part in a semi-structured interview that will take place in a confidential setting at the Lister Hospital, Stevenage with the researcher. A semi-structured interview is an interview where you will be asked some set questions but new questions may be asked following your answers. The semi-structured interview in this research is called a repertory grid. A repertory grid asks people to think about how they are the same or different to other people in their life or how aspects of themselves may be different or the same i.e. how I am now compared to how I was before a thyroid problem. You will also be asked to fill in some questionnaires relating to depression, hypothyroid symptoms and how you are coping with the disorder. The interview will be confidential and it should take approximately one and a half hours.

Some of the experiences that we may talk about could be distressing as you will have to think about your experiences of having an overactive and underactive thyroid, which may have been difficult. The questionnaires may also be distressing if you are experiencing depression or difficulties with the symptoms of hypothyroidism. If the researcher is worried that there is an immediate risk of you harming yourself then she will need to accompany you to the Accident and Emergency department at Lister Hospital. Your G.P. will be informed if you consent to participate in the study and will be informed if the researcher is concerned about your mental health. The researcher will also need to examine your medical records to obtain information in relation to your thyroid disorder and any symptoms of depression.

You will be asked to sign an informed consent form that will state that you have a right to withdraw from the project at any time. The researcher's contact details will be on the form. Your care in regards to your thyroid disorder will remain the same whether or not you choose to participate. When the interview is completed you will have the opportunity to discuss your experience of the interview with the researcher.

This study has been approved by Cambridgeshire 3 Research Ethics Committee. This is an independent body whose role is to ensure that research is conducted in a safe and ethical manner. The research design has also been formally reviewed by the University of Hertfordshire's Doctoral Programme in Clinical Psychology.

In the event that something goes wrong and you are harmed during the research and this is due to someone's negligence then you may have grounds for a legal action for compensation against University of Hertfordshire but you may have to pay your legal costs. The normal NHS complaints mechanisms will still be available to you.

### **1. Confidentiality**

- Your participation is confidential. However the team who are supporting you may be aware that you will take part in this project. The team will have access to your personal details but they will not have access to the research data.
- The personal information from your research interview and your personal details will be stored securely so as to further ensure confidentiality.
- The repertory grid and questionnaires will be anonymised. They may be viewed by the research supervisors (Professor. David Winter and Joerg Schulz), and by those responsible for examining the researcher.
- The only circumstance under which confidentiality would be broken is if you disclose information that leads the researcher to have serious concerns about your safety, or that of others. If there is an immediate concern, then I will accompany you to the Accident and Emergency department in order to obtain help for you and contact your G.P. to discuss these concerns.

### **2. The interview process**

- The interview will last for approximately one and a half hours.
- The interviewer will ask every participant similar questions. What the interviewer is interested in includes:
  - i. How you view yourself with an underactive thyroid, with an overactive thyroid, you before a thyroid disorder and your ideal self
  - ii. How you view some significant people in your life
  - iii. If you experience any depressive symptoms
  - iv. If you experience any hypothyroid symptoms and how much they bother you
  - v. How you are coping with having a thyroid disorder

### **3. During the interview**

- Should you wish to decline to answer any questions, it is your right to do so.
- If at any time you wish to take a break or terminate the interview, it is your right to do so.
- If we cannot finish the research in one session, your travel expenses will be reimbursed if you need to make an additional trip.

### **4. Following the interview**

- After the interview you will be invited to talk about your experience of being interviewed and how it has left you feeling.
- There will also be the opportunity to ask questions. In the event that the researcher is unable to answer you, he will contact you with an answer following the interview.

### **5. What will happen to the results of this research study?**

- a. The results of participant interviews will be reported in a thesis for the purpose of gaining a qualification in Clinical Psychology.

- b. The thesis will be held in the University of Hertfordshire Learning Resource Centre and will be accessible to interested parties.
- c. Your personal details will be kept anonymous in the write up of the project.
- d. A summary of the main research findings may be published as an article.

**6. How long will my personal information be kept?**

- a. Your personal information and recordings will be kept for up to five years after the research is submitted for examination (until approximately June 2016). The information will be stored securely according to the University of Hertfordshire's 'Good practice in research' guidelines.

**7. What if there is a problem?**

- a. If you have concerns about any aspect of the research process then please speak to the researcher. Alternatively, you can contact the Primary Research Supervisor, Professor. David Winter, on 01707286322, if you wish to make a formal complaint.

- b. Alternatively, you may wish to complain to the Independent Complaints Advocacy Service (ICAS), which is specifically for individuals wishing to pursue a claim against the NHS (<http://www.dh.gov.uk>)

The contact details for the areas covered by this study are as follows:

- ICAS Bedfordshire & Hertfordshire Tel: 0845 456 1082
- c. If you feel at all concerned about the research you may wish to complain to the Patient Advice Liaison Service (PALS). This is an NHS based service for individuals who want to make a complaint against the NHS or an individual NHS staff member. Their details are: 01438 784 779 or emailing [pals.enh-tr@nhs.net](mailto:pals.enh-tr@nhs.net)

**8. Do you have any questions?**

Thank you for taking time to read this information. *If you are happy to take part in the research please look over and sign the informed consent form and return in the stamped addressed envelope.*

My contact details are: .....

Many thanks, Sarah

**Appendix G: INFORMED CONSENT FORM**

Version 2, Date: 27/09/10

Participant identification number:.....

**Project Title: Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment**

**Name of researcher:** Sarah Patient, Trainee Clinical Psychologist

To be completed by participant (Please initial each box):

I confirm that I have read and understand the information sheet dated 27/09/10 (Version: 2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
I understand that I am free to decline entry into the study and I am able to leave the study at any time without giving a reason.	
I understand that data collected by this research will be looked at by authorised persons from the University of Hertfordshire (Sponsoring organisation). Anonymised sections of the data collected may also be looked at by representatives from academic and professional assessment bodies in order to assess the quality of this doctoral research project. All will have a duty of confidentiality to you as a research participant.	
I understand that the Chief Investigator, Endocrinologist, clinical staff and administrative staff already involved in my care will need to look through my medical file, only to find information relevant to thyroid disorders and depression.	
I understand that my General Practitioner will be informed of my participation in this research.	
I understand that my G.P. will be contacted if the researcher has concerns about my mental health.	
I understand that the anonymised data and personal details will be kept securely for 5 years after the research is submitted for examination (until approximately June 2016), after which time it will be destroyed by the researcher.	
I agree to take part in the above study.	

**Name of Participant:** ..... **Signature:** ..... **Date:**.....

**Telephone number:**.....

Name of the Researcher

taking the consent ..... **Signature:** ..... **Date:**.....

**If you consent to participate in the above study, please return this form to:**

**Sarah Patient, Trainee Clinical Psychologist,  
 Doctorate in Clinical Psychology Programme,  
 Health Research Building,  
 University of Hertfordshire,  
 College Lane Campus,  
 Hatfield, Herts. AL10 9AB**

**Or please call me on .....to  
 arrange a suitable time for an  
 appointment**

APPENDIX H

INFORMATION ABOUT THE RESEARCH PROJECT

Version 2, Date: 27/09/10

Dear Dr .....

RE: Patient name, D.O.B., Address

The above named patient has agreed to participate in the following study: **Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment.**

I am the Chief Investigator and I am a third year trainee clinical psychologist at the University of Hertfordshire. As part of my training I have to do a research project. I am interested in your patients' view of themselves with hypothyroidism following treatment for hyperthyroidism and how this relates to symptoms of depression, symptom difficulty and coping styles. Currently there is little research focusing on the psychological factors contributing to depression and symptom difficulty in hypothyroidism.

**Who can participate?**

I am looking for people with a diagnosis of hypothyroidism who:

- Developed hypothyroidism as a result of receiving radioiodine treatment for hyperthyroidism.
- Have had stable thyroid function tests for the past three months following receiving thyroid replacement hormone.
- Are between the ages of 18 and 65 years old.

**Why is this research important?**

I am hoping that this research will inform clinicians' practice and understanding about the factors which maintain symptoms of hypothyroidism, including depression. This research may highlight the influence of specific views of patients' have of themselves, which maintain symptoms of hypothyroidism. This could have several benefits including:

- Using the information to identify patients who may benefit from psychological interventions to improve these symptoms.
- Increasing health professionals understanding of the personal impact of having hypothyroidism and hyperthyroidism on their view of themselves and the world.

**What would participation involve?**

Participants would be asked to take part in a semi-structured interview, which involves asking some set questions but also new questions based on the participants answer. This will take place at a confidential setting on an NHS site. The interview will be confidential, it should take approximately an hour and a half and it will involve asking clients about the way they view themselves and other people in their life. Participants will also be asked to complete questionnaires in relation to depression, symptom difficulty and coping styles. Participants will be required to sign an informed consent

form stating that if there are any issues of risk or concerns about their mental health then I will need to contact you, as their G.P. in order to discuss them. If they require immediate support, I have informed the participant that I will need to accompany them to the Accident and Emergency department at Lister Hospital. The informed consent form will also state that they have a right to withdraw at any time from the research and the contact details of the researcher will be on the form. Following the interview participants will be given the opportunity to debrief about the interview and to ask any questions of the researcher. If it is not possible to complete the research in one session, the participant's travel expenses will be reimbursed if they need to make an additional trip.

This study has been approved by the Cambridgeshire 3 Research Ethics Committee. The Research Ethics Committee is an independent body whose role is to ensure that research is conducted in a safe and ethical manner. The research design has also been formally peer reviewed by the University of Hertfordshire's Doctoral Programme in Clinical Psychology.

In the event that something does go wrong and the patient is harmed during the research and this is due to someone's negligence then they may have grounds for a legal action for compensation against University of Hertfordshire but they may have to pay their legal costs. The normal National Health Service complaints mechanisms will still be available.

If you have any questions, please do not hesitate to contact me.  
My contact details are:

.....

Yours sincerely  
Sarah Patient  
Trainee Clinical Psychologist

## APPENDIX I

### LEAFLETS FOR RECRUITING ONLINE PARTICIPANTS

Version 1, Date: 22/11/10

#### **Psychological research into hypothyroidism**

If you have developed hypothyroidism following radioiodine treatment, are aged between 18-65 years and been on the same dosage of Thyroxine Replacement Hormone (TRH) for 3 months then I would like to invite you to take part in a research project called:

Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment

There is little research looking at the psychological factors involved in hypothyroidism. Therefore, this research project will try to address this. The research will involve you answering some questions used to complete a "repertory grid" which is a method for enquiring about how people make sense of their experiences, including how you view yourself with a thyroid condition. There are some questions that measure depressive symptoms, hypothyroid symptom difficulty and coping style. There are also questions related to your thyroid condition.

The project is being carried out by Sarah Patient, Trainee Clinical Psychologist at the University of Hertfordshire as part of a Doctoral qualification in Clinical Psychology. The study is supervised by Professor David Winter, Professor of Clinical Psychology and Chartered Clinical Psychologist and Dr Felicity Kaplan, Consultant Endocrinologist.

For more information, please go to [www.thyroidresearch.co.uk](http://www.thyroidresearch.co.uk). You will find contact details for Sarah Patient, Trainee Clinical Psychologist (Chief Investigator) if you require further information.

This project has been approved by the Cambridgeshire 3 Research Ethics Committee and the University of Hertfordshire.

## Appendix J: REC approval 1



### **National Research Ethics Service** **Cambridgeshire 3 Research Ethics Committee**

Victoria House  
Capital Park  
FULBOURN  
Cambridge  
CB21 5XB

Telephone: 01223 597597  
Facsimile: 01223 597645

11 October 2010

Miss Sarah Patient  
Department of Psychology (DClinPsy)  
University of Hertfordshire  
College Lane Campus  
Hatfield  
AL10 9AB

Dear Miss Patient

**Study Title:** Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment  
**REC reference number:** 10/H0306/62

Thank you for your letter of recent letter responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered in correspondence by a sub-committee of the REC. A list of the sub-committee members is attached.

#### **Confirmation of ethical opinion**

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

#### **Ethical review of research sites**

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### **Conditions of the favourable opinion**

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within the National Patient Safety Agency and Research Ethics Committees in England*

**It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).**

### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Investigator CV: Miss Sarah Patient		25 July 2010
Protocol	1	11 July 2010
Protocol	2	27 September 2010
Supervisor CV: David Winter		
REC application		29 July 2010
Letter from Sponsor: University of Hertfordshire		29 July 2010
Questionnaire: ThySRQ		
Information for Professionals	1	25 June 2010
GP/Consultant Information Sheets	2	27 September 2010
Response to Request for Further Information		
Participant Information Sheet	2	27 September 2010
Participant Information Sheet: Information Sheet for Professionals	2	30 September 2010
Participant Consent Form	2	27 September 2010
Questionnaire: Brief COPE		
Questionnaire: Hospital Anxiety and Depression Scale		
Evidence of insurance or indemnity		01 August 2010

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

### After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

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the National Patient Safety Agency and Research Ethics Committees in England*

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email [referencegroup@nres.npsa.nhs.uk](mailto:referencegroup@nres.npsa.nhs.uk).

10/H0306/62

Please quote this number on all correspondence

Yours sincerely



Mr John Richardson  
Chair

Email: [lynda.mccormack@eoe.nhs.uk](mailto:lynda.mccormack@eoe.nhs.uk)

Enclosures: *List of names and professions of members who were present at the meeting and those who submitted written comments*

*"After ethical review – guidance for researchers"*

Copy to: Professor David Winter  
University of Hertfordshire  
College Lane Campus  
Hatfield  
Hertfordshire  
AL10 9AB

Natercia Godinho  
R&D Manager  
R&D Office  
CPFT  
Douglas House  
18 Trumpington Road  
Cambridge  
CB2 8AH

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England*

**Cambridgeshire 3 Research Ethics Committee**

**Attendance at Sub-Committee of the REC meeting on 11 October 2010**

**Committee Members:**

<i>Name</i>	<i>Profession</i>	<i>Present</i>	<i>Notes</i>
Mr John Richardson (Chair)	Lay member	Yes	
Dr Stella Lowry	General Practitioner	Yes	

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England*

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## Appendix K : University of Hertfordshire Ethics Approval

Revised (September 2006)

### SCHOOL OF PSYCHOLOGY ETHICS COMMITTEE APPROVAL

**Student Investigator:** Sarah Patient

**Title of project:** Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment

**Supervisor:** David Winter

**Registration Protocol Number:** PSY/01/11/SP

The approval for the above research project was granted on 19 January 2011 by the Psychology Ethics Committee under delegated authority from the Ethics Committee of the University of Hertfordshire.

The end date of your study is 31 July 2011

Signed:



Date: 19 January 2011

Professor Lia Kvavilashvili  
Chair  
Psychology Ethics Committee

-----  
**STATEMENT OF THE SUPERVISOR:**

From my discussions with the above student, as far as I can ascertain, s/he has followed the ethics protocol approved for this project.

Signed (supervisor): .....

Date: .....

## Appendix L : Research and Development Approval

08.NOV.2010 14:54 01438781302

THEATRE LISTER.

#7936 P.001 /001

### Hertfordshire Hospitals R&D Consortium

Incorporating West Herts Hospitals NHS Trust and East & North Herts NHS Trust

R&D Office, Clinical Governance Support Centre (LC57D)  
Maternity Unit, York suite  
Lister Hospital  
East & North Herts NHS Trust  
Coreys Mill Lane  
Stevenage  
Herts  
SG1 4AB

Tel: Internal: Lister X6688  
Direct Line: 01438 286 688

08 November 2010

Dr Felicity Kaplan  
East and North Hertfordshire NHS Trust  
Endocrinology Department  
Coreys Mill Lane  
Stevenage

Dear Dr Kaplan

**Re: RD2010-73    Personal constructs, depression and symptom bother in hypothyroidism - Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment**

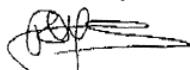
Following review by the Research and Development Committee, I am pleased to confirm that the above project now has Trust approval to recruit patients at the Lister Hospital

May we remind you that the Principal Investigator is responsible for ensuring that research is conducted in accordance with the Department for Health Research Governance Framework. It must also comply with the law, all internal Trust policies and processes and any relevant good practice guidance. The research may be subject to internal or external monitoring.

Should you have any queries or require further information, please contact the Research & Development office on the above numbers.

Best wishes for a successful project.

Yours sincerely,



**Dr S. Gowrie-Mohan**  
Associate Director of R&D

Carbon Copy: (CI) Miss Sarah Patient

## Appendix M : Research Ethics Committee amendment 1 approval



### **National Research Ethics Service** **Cambridgeshire 3 Research Ethics Committee**

Victoria House  
Capital Park  
FULBOURN  
Cambridge  
CB21 5XB

Tel: 01223 597597  
Fax: 01223 597645

17 December 2010

Miss Sarah Patient  
Department of Psychology (DClinPsy)  
University of Hertfordshire  
College Lane Campus  
Hatfield  
AL10 9AB

Dear Miss Patient

**Study title:** Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment

**REC reference:** 10/H0306/62

**Amendment number:** Amendment #1

**Amendment date:** 18 November 2010

**Amendment Summary:** The researchers would like to approach potential participants who have been discharged from the endocrinology unit and whose conditions are managed instead by primary care trusts. The GP of each potential participant will need to be consulted to make sure the potential participant complies with the inclusion criteria for the study. If the potential participant does meet the inclusion criteria, then the study administrators can send them the same information sheet, same consent form and pre-paid envelope as is received by participants at the endocrinology clinic. The protocol has been updated to reflect this change.

The above amendment was reviewed by the Sub-Committee in correspondence.

#### **Ethical opinion**

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

#### **Approved documents**

The documents reviewed and approved at the meeting were:

Document	Version	Date
Protocol	version 3	01 November 2010
Notice of Substantial Amendment (non-CTIMPs)		18 November 2010
Covering Letter		19 November 2010

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England

### Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

### R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

**10/H0306/62:**

**Please quote this number on all correspondence**

Yours sincerely



**Mrs Lynda McCormack  
Committee Co-ordinator**

E-mail: [lynda.mccormack@eoe.nhs.uk](mailto:lynda.mccormack@eoe.nhs.uk)

*Enclosures: List of names and professions of members who took part in the review*

*Copy to:* Professor David Winter  
University of Hertfordshire  
College Lane Campus  
Hatfield  
Hertfordshire  
AL10 9AB

Natercia Godinho  
R&D Manager  
R&D Office  
CPFT  
Douglas House  
18 Trumpington Road  
Cambridge  
CB2 8AH

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
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**Cambridgeshire 3 Research Ethics Committee**

**Attendance at Sub-Committee of the REC meeting on 16 December 2010**

<i>Name</i>	<i>Profession</i>	<i>Capacity</i>
Dr Sati Ariyanayagam	Consultant Physician	Expert
Mr Stuart Kent	Retired Consultant Surgeon	Expert
Mr David Lewin	Research Officer	Lay

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England*

## Appendix N: Research Ethics Committee amendment 2 approval



### **National Research Ethics Service** Cambridgeshire 3 Research Ethics Committee

Victoria House  
Capital Park  
FULBURN  
Cambridge  
CB21 5XB

Tel: 01223 597597  
Fax: 01223 597645

17 December 2010

Miss Sarah Patient  
Department of Psychology (DClinPsy)  
University of Hertfordshire  
College Lane Campus  
Hatfield  
AL10 9AB

Dear Miss Patient

<b>Study title:</b>	<b>Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment</b>
<b>REC reference:</b>	<b>10/H0306/62</b>
<b>Amendment number:</b>	<b>Amendment #2</b>
<b>Amendment date:</b>	<b>07 December 2010</b>
<b>Amendment Summary:</b>	<b>In order to achieve sufficient statistical power, the researchers would like to recruit online via the British Thyroid Foundation. The researchers would advertise using a leaflet (appendix G) in their newsletter and on their facebook page. When potential participants visit the website, they will be given further information via an information sheet (appendix E). The potential participants will be asked if they meet the inclusion criteria, and if they do they will then proceed to the informed consent form (appendix F). If the potential participant answers yes to the informed consent questions, they will then proceed to background, medical questions, semi-structured interviews and questionnaires (appendix H).</b>

The above amendment was reviewed by the Sub-Committee in correspondence.

#### **Ethical opinion**

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

#### **Approved documents**

The documents reviewed and approved at the meeting were:

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England*

Document	Version	Date
Protocol	VERSION 4	26 November 2010
Notice of Substantial Amendment (non-CTIMPs)		07 December 2010
Covering Letter		03 December 2010

### Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

### R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

<b>10/H0306/62:</b>	<b>Please quote this number on all correspondence</b>
---------------------	---

Yours sincerely



**Mrs Lynda McCormack**  
Committee Co-ordinator

E-mail: [lynda.mccormack@eoe.nhs.uk](mailto:lynda.mccormack@eoe.nhs.uk)

*Enclosures:* List of names and professions of members who took part in the review

*Copy to:* Professor David Winter  
University of Hertfordshire  
College Lane Campus  
Hatfield  
Hertfordshire  
AL10 9AB

Natercia Godinho  
R&D Manager  
R&D Office  
CPFT  
Douglas House  
18 Trumpington Road  
Cambridge  
CB2 8AH

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within the National Patient Safety Agency and Research Ethics Committees in England*

**Cambridgeshire 3 Research Ethics Committee**

**Attendance at Sub-Committee of the REC meeting on 16 December 2010**

<i>Name</i>	<i>Profession</i>	<i>Capacity</i>
Dr Sati Ariyanayagam	Consultant Physician	Expert
Mr Stuart Kent	Retired Consultant Surgeon	Expert
Mr David Lewin	Research Officer	Lay

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England*

## Appendix O : Research Ethics Committee amendment 3 approval



### **National Research Ethics Service** Cambridgeshire 3 Research Ethics Committee

Victoria House  
Capital Park  
FULBOURN  
Cambridge  
CB21 5XB

Tel: 01223 597597  
Fax: 01223 597645

25 February 2011

Miss Sarah Patient  
Department of Psychology (DClinPsy)  
University of Hertfordshire  
College Lane Campus  
Hatfield  
AL10 9AB

Dear Miss Patient

**Study title:** Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment

**REC reference:** 10/H0306/62

**Amendment number:** Amendment # 3

**Amendment date:** 02 February 2011

**Amendment Summary:** The researchers would like to recruit online through organisations other than the British Thyroid Foundation. The researchers have approached the Thyroid Foundation of North Cumbria and Thyroid UK, non-profit organisations which provide help and support to people with thyroid disorders. The previously approved leaflet (appendix G) will be placed on their websites and forums. They may also be given to support group coordinators to direct group members who fit the criteria to the website.

The above amendment was reviewed by the Sub-Committee in correspondence.

#### **Ethical opinion**

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

#### **Approved documents**

The documents reviewed and approved at the meeting were:

Document	Version	Date
Protocol	version 5	31 January 2011
Notice of Substantial Amendment (non-CTIMPs)	Amendment # 3	02 February 2011
Covering Letter		03 February 2011

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within the National Patient Safety Agency and Research Ethics Committees in England*

**Membership of the Committee**

The members of the Committee who took part in the review are listed on the attached sheet.

**R&D approval**

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

**Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

<b>10/H0306/62:</b>	<b>Please quote this number on all correspondence</b>
---------------------	---

Yours sincerely



**Mrs Lynda McCormack  
Committee Co-ordinator**

E-mail: [lynda.mccormack@eoe.nhs.uk](mailto:lynda.mccormack@eoe.nhs.uk)

*Enclosures: List of names and professions of members who took part in the review*

*Copy to:* Professor David Winter  
University of Hertfordshire  
College Lane Campus  
Hatfield  
Hertfordshire  
AL10 9AB

Natercia Godinho  
R&D Manager  
R&D Office  
CPFT  
Douglas House  
18 Trumpington Road  
Cambridge  
CB2 8AH

**Cambridgeshire 3 Research Ethics Committee**

**Attendance at Sub-Committee of the REC meeting on 23 February 2011**

<i>Name</i>	<i>Profession</i>	<i>Capacity</i>
Mr Stuart Kent	Retired Consultant Surgeon	Expert
Mr John Richardson	Lay member	Lay

## Appendix P: Research Ethics Committee amendment 4 approval



### National Research Ethics Service Cambridgeshire 3 Research Ethics Committee

Victoria House  
Capital Park  
FULBOURN  
Cambridge  
CB21 5XB

Tel: 01223 597685  
Fax: 01223 597645

15 April 2011

Miss Sarah Patient  
Department of Psychology (DClinPsy)  
University of Hertfordshire  
College Lane Campus  
Hatfield  
AL10 9AB

Dear Miss Patient

**Study title:** Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment

**REC reference:** 10/H0306/62

**Amendment number:** Amendment #4

**Amendment date:** 24 March 2011

The above amendment was reviewed by the Sub-Committee in correspondence.

#### Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

#### Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Protocol	6	24 March 2011
Notice of Substantial Amendment (non-CTIMPs)	Amendment #4	24 March 2011
Covering Letter	Sarah Patient	24 March 2011

#### Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

This Research Ethics Committee is an advisory committee to the East of England Strategic Health Authority  
The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England

### R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

**10/H0306/62:**

**Please quote this number on all correspondence**

Yours sincerely

*pr* 

**Mr John Richardson  
Chair**

E-mail: Nicky.Storey@eoe.nhs.uk

*Enclosures:* *List of names and professions of members who took part in the review*

*Copy to:* Professor David Winter  
University of Hertfordshire  
College Lane Campus  
Hatfield  
Hertfordshire  
AL10 9AB

Natercia Godinho  
R&D Manager  
R&D Office  
CPFT  
Douglas House  
18 Trumpington Road  
Cambridge  
CB2 8AH

This Research Ethics Committee is an advisory committee to East of England Strategic Health Authority  
*The National Research Ethics Service (NRES) represents the NRES Directorate within  
the National Patient Safety Agency and Research Ethics Committees in England*

**Cambridgeshire 3 Research Ethics Committee**

**Attendance at Sub-Committee of the REC meeting on 11 April 2011**

<i>Name</i>	<i>Profession</i>	<i>Capacity</i>
Dr Michael Sheldon (Chair)	Retired Clinical Psychologist	Lay
Dr Robert Stone	General Practitioner	Expert

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the National Patient Safety Agency and Research Ethics Committees in England*

APPENDIX Q

**PARTICIPANT INFORMATION FOR ONLINE RECRUITMENT**

Version 1, Date: 22/11/10

My name is Sarah Patient and I am a third year trainee clinical psychologist at the University of Hertfordshire. As part of my training I have to do a research project. I am writing to you because I am interested in your experience of having a thyroid disorder and I hope that you might be willing to take part in my online research project which is called:

**Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment**

Currently there is little research focusing on how people who have hypothyroidism view themselves with a thyroid disorder, both under- and over-active and how this affects their view of the world. The project aims to better understand how these views might be related to depression and symptom difficulty. The project will also look at how people cope with having a thyroid disorder. It is hoped that this project will increase professionals understanding of the psychological factors involved in hypothyroidism and that it will improve their work in this area. Before you decide whether to take part, please take the time to read the following information which I have written to help you understand why the research is being carried out and what it will involve.

**The researchers**

The study is being carried out by Sarah Patient, Trainee Clinical Psychologist, as part of a Doctoral qualification in Clinical Psychology. The study is supervised by Professor David Winter, Professor of Clinical Psychology and Chartered Clinical Psychologist, and Dr Felicity Kaplan, Consultant Endocrinologist.

**Who is taking part?**

I am interested in people who meet the following criteria:

- Participants who have developed hypothyroidism following radioiodine treatment for hyperthyroidism.

- Participants will be patients who have been stable on the same dosage of thyroxine replacement hormone for at least 3 months.
- Participants between the ages of 18-65 years old.

Unfortunately I would not be able to conduct research with:

- Participants who have hypothyroidism with another cause other than radioiodine treatment will be excluded.
- Participants with subclinical hypothyroidism
- Non-English speaking participants

### **What would participation involve?**

There are a number of questions asking for background information. This would involve answering questions online to complete a 'repertory grid'. A repertory grid asks people to think about how they are the same or different to other people in their life or how aspects of themselves may be different or the same i.e. how I am now compared to how I was before a thyroid problem. You will also be asked to answer some questions relating to your thyroid condition e.g. when you were diagnosed, your thyroid medication level and the date of radioiodine treatment. You will also be asked to answer some questionnaires relating to depression, hypothyroid symptoms and how you are coping with the disorder. The information will be confidential and it should take approximately one and a half hours.

Some of the experiences that we may talk about could be distressing as you will have to think about your experiences of having an overactive and underactive thyroid, which may have been difficult. The questionnaires may also be distressing if you are experiencing depression or difficulties with the symptoms of hypothyroidism. A list of support organisations, such as the Samaritans will be made available to you. If you think you are at an immediate risk of harming yourself, you should attend your local Accident and Emergency department. You would be strongly advised to contact your G.P in order to obtain the support you require.

If you wish to participate, you will be directed to an informed consent form. This will state that you have a right to withdraw from the project at any time. You will be asked to mark if you agree to each of the conditions of the research. The researcher's contact details will be on the form should you require any further information.

This study has been approved by Cambridgeshire 3 Research Ethics Committee. This is an independent body whose role is to ensure that research is conducted in a safe and ethical manner. The research design has also been formally reviewed by the University of Hertfordshire's Doctoral Programme in Clinical Psychology.

In the event that something goes wrong and you are harmed during the research and this is due to someone's negligence then you may have grounds for a legal action for compensation against University of Hertfordshire but you may have to pay your legal costs.

## **9. Confidentiality**

- Your participation is confidential. You will not be asked for your name or contact details.
- The personal information from your research will be stored securely so as to further ensure confidentiality.
- The repertory grid and questionnaires may be viewed by the research supervisors (Professor. David Winter and Joerg Schulz), and by those responsible for examining the researcher.

## **10. The research process**

- The research will last for approximately one and a half hours.
- Each participant will be asked very similar questions. What the researcher is interested in includes:
  - i. Background details i.e. age, ethnicity and details related to your thyroid condition
  - ii. How you view yourself with an underactive thyroid, with an overactive thyroid, you before a thyroid disorder and your ideal self
  - iii. How you view some significant people in your life
  - iv. If you experience any depressive symptoms
  - v. If you experience any hypothyroid symptoms and how much they bother you
  - vi. How you are coping with having a thyroid disorder

## **11. During the research**

- Should you wish to decline to answer any questions, it is your right to do so.
- If at any time you wish to terminate the research, it is your right to do so.

**12. Following the interview**

- You will be given further information and details of support organisations if you are feeling distressed. You will also be able to contact the researcher to ask any questions.

**13. What will happen to the results of this research study?**

- a. The results of participant interviews will be reported in a thesis for the purpose of gaining a qualification in Clinical Psychology.
- b. The thesis will be held in the University of Hertfordshire Learning Resource Centre and will be accessible to interested parties.
- c. A summary of the main research findings may be published as an article.

**14. How long will my information be kept?**

- a. Your information will be kept for up to five years after the research is submitted for examination (until approximately June 2016). The information will be stored securely according to the University of Hertfordshire's 'Good practice in research' guidelines.

**15. What if there is a problem?**

- a. If you have concerns about any aspect of the research process then please speak to the researcher. Alternatively, you can contact the Primary Research Supervisor, Professor. David Winter, on 01707286322, if you wish to make a formal complaint.

**16. Do you have any questions?**

Thank you for taking time to read this information. *If you are happy to take part in the research please click on the button below to go the informed consent form page.*

Many thanks,

Sarah

Contact details of the researcher:

Sarah Patient, Trainee Clinical Psychologist

Email address: [s.patient1@herts.ac.uk](mailto:s.patient1@herts.ac.uk)

Telephone number: 07973 240 964

Postal address: Doctorate in Clinical Psychology Programme

University of Hertfordshire, Health Research Building, College Lane Campus,

Hatfield, Herts., AL10 9AB

APPENDIX R

INFORMED CONSENT FORM FOR ONLINE PARTICIPANTS

Version 1, Date: 22/11/10

**Project Title: Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment**

**Name of researcher:** Sarah Patient, Trainee Clinical Psychologist

To be completed by participant

1. I confirm that I have read and understand the information sheet dated 22/11/10 (Version: 1) for the above study. I have had the opportunity to consider the information.	
2. I understand that I am free to decline entry into the study and I am able to leave the study at any time without giving a reason.	
3. I understand that data collected by this research will be looked at by authorised persons from the University of Hertfordshire (Sponsoring organisation). Anonymised sections of the data collected may also be looked at by representatives from academic and professional assessment bodies in order to assess the quality of this doctoral research project. All will have a duty of confidentiality to you as a research participant.	
4. I understand that the anonymised data and personal details will be kept securely for 5 years after the research is submitted for examination (until approximately June 2016), after which time it will be destroyed by the researcher.	
5. I agree to take part in the above study.	

If you **agree** to all of the above then please click here

**APPENDIX S**

**Information for online recruitment and format of website**

This would be the order of the information and example instructions and questions for the repertory grid

**1. Information sheet**

**2. Inclusion criteria/Exclusion criteria (participants answer yes or no and can only proceed with yes)**

- a. Developed hypothyroidism after radioiodine treatment for hyperthyroidism?
- b. Have been stable on the same dosage of thyroxine replacement hormone for at least 3 months
- c. 18-65 years old
- d. Do not have subclinical hypothyroidism
- e. English speaking?

**3. Consent form (participants answer yes or no and can only proceed with yes)**

**4. Background information**

2. Age
3. Gender
4. Ethnicity
5. Are you currently working?
6. Are you back to you doing the same activities/functioning as you were before you developed any thyroid disease problem
7. Do you have a history of depression?
8. Rough date of noticing hyperthyroid symptoms
9. What were the symptoms?
10. Rough date of diagnosis of hyperthyroid symptoms
11. Date of radioiodine treatment
12. Date 1<sup>st</sup> noticed hypothyroid symptoms
13. Date diagnosed with hypothyroid
14. How long on thyroid replacement hormone (TRH)
15. Stability since TRH given
16. Dosage of TRH
17. Other significant physical health problems

**5. Repertory grid**

**Instructions:** On the following page, you will be asked a range of questions. **You will need a pen and paper for this section.** You will need to write down your answers, but you will be instructed what to write and when, so please do not worry. **Just follow the instructions carefully.**

This section will help me find out about how you view yourself with different thyroid conditions and how you view others.

The following is a list of roles. Some of these relate to you at different times in your life or

different aspects of yourself and some relate to other people. Where there is a space to write a name, think of someone in your own life that fits with that role and write down a name next to the heading.

- a) Self now
- b) Self before a thyroid problem
- c) Self with an underactive thyroid
- d) Self with an overactive thyroid
- e) Mum (or person you consider closest to this role)
- f) Dad (or person you consider closest to this role)
- g) Partner/Significant person in your life (name)
- h) Person I like (name)
- i) Person I dislike (name)
- j) Ideal self

### **Describing People**

You will be asked to describe those people/roles listed. Answer the questions in order and write down your answers when asked to do so. It is important that you keep them in order as you will need to put them into a table later. Make two columns and label one 'describing word' and one 'opposite word'

When answering the questions, the descriptions you come up with need to describe the people and not how they look or their jobs (eg answer such as male/female not appropriate). **Also, your answers must not be repeated - use different descriptions for each answer.**

There are no set answers -- these are YOUR descriptions. Therefore, you may find your answers differ from how another person might answer them.

### **Example Repertory grid questions**

1a. Look at 'self now', 'self before a thyroid problem' and 'Mum'. How are any **two** of these alike but different from the third? Write your answer in the 'describing word' column. If you need help, click the More Info button

(MORE INFO BUTTON- For example, I might describe 'Mum' and 'self before a thyroid problem' as "fun-loving" but 'self now' isn't particularly fun-loving. So I would write "fun-loving".)

1b. What is the opposite of the term you've identified above? Write your answer in the column 'opposite word'. If you need help, click on the More Info box.

(MORE INFO BUTTON - So, I identified the word "fun-loving" in my first answer. I might think about a time when I was not "fun-loving" and I would say that when I'm not being "fun-loving", I'm "tired". So, for me, the opposite of being "fun-loving" for me is "tired". I would write "tired" in the box. Therefore it does not have to be a direct opposite but whatever you think is opposite.)

Remember to write down answers in the columns

2a. Look at the 'self now', 'self with an overactive thyroid' and 'Mum'. Think of how two of these are alike which make them different from the third? Write this down on your paper

2b. What is the opposite of the term above for you?

**Putting the Information into a Table (a Repertory Grid)**

On your handwritten paper, you should be left with two columns of words. One column titled "describing word" and one column titled "opposite word".

On the next page, you will see a table.

**STEP ONE**

Transfer your words (descriptions) into the table. Type your answers in the same order in the columns headed 'Describing word' and 'Opposite word'.

**STEP TWO**

Score each of the people from your list according to your descriptions on a scale of 7-1. **A score of 7 means the person is most like the *describing word* word and 1 scores them as most like the opposite word.**

Score all the people on your list according to the words you have collected.

**The Repertory Grid**

**EXAMPLE**

For example, the first person on my list is a 'self now'. My describing word is "fun-loving" and my opposite word is "tired". If I think myself now is a little bit of a tired person, I will score myself as a "3". I would put that in the box under *Self Now* and level with Fun-loving-tired (my preferred and non-preferred words).

Myself with an underactive thyroid might be very tired, so I might score this aspect of myself as 1 under *Self with an underactive thyroid* and level with fun-loving-tired.

**Most like your preferred word--7--6--5--4--3--2--1--Most like your non-preferred word**

Self now	Self with an underactive thyroid	Self with an overactive thyroid	Self before thyroid problem	Mum (or person I consider Mum)	Dad	Partner /Significant person	Person I like	Person I dislike	Dr	Preferred (most like this word = 7)	Non-preferred (most like this word = 1)

**6. Questionnaires**

The Hospital Anxiety and Depression Scale (HADS), Brief Cope and Thyroid Symptom Rating Questionnaire (ThySRQ) would also be added to be completed onli

Title of project: Personal constructs, depression, symptom difficulty and coping in patients who have hypothyroidism following radioiodine treatment – Sarah Patient

### **Appendix T**

Version 1, Date: 06.12.10

## **DEBRIEFING INFORMATION SHEET**

Thank you very much for making this study possible.

This study aimed to explore the experiences of people who have developed hypothyroidism after treatment for hyperthyroidism. I was interested in:

- How you view/viewed yourself before a thyroid problem, with an overactive thyroid and with an underactive thyroid and how this relates to your ideal self and different people in your life.
- How these views relate to any depressive symptoms, thyroid symptom difficulties and coping styles

The current academic literature in this field is almost non-existent, however, some research has shown that symptoms can continue after adequate treatment. It was hoped that this exploratory research would help us to gain an insight into your experiences and provide a foundation on which discussion regarding psychological theory and appropriate interventions can begin.

In the event that participation in the research has raised any issues or concerns for you, please do not hesitate to contact me, or my supervisor, using the details below.

Miss Sarah Patient  
Trainee Clinical Psychologist  
University of Hertfordshire  
[s.patient1@herts.ac.uk](mailto:s.patient1@herts.ac.uk)

Supervisor: Professor David Winter  
Clinical Psychologist  
University of Hertfordshire  
[d.winter@herts.ac.uk](mailto:d.winter@herts.ac.uk)

### **SOURCES OF COMFORT AND HELP**

Talking about your experiences may have left you feeling low or upset, this is quite normal and often passes after a few days. However, if these feelings persist there are local sources of support and comfort which may already be familiar to you.

1. The most immediate sources of comfort and help are likely to be *your own family and friends*.
2. *Your GP* may be able to refer you to more specialised local support services such as counsellors if you feel this may be of benefit.

**The following national organisations offer support:**

3.

**MIND**

**Leading mental health charity in England and Wales. The MindInfoLine offers thousands of callers confidential help on a range of mental health issues.**

15-19 Broadway, London E15 4BQ

Tel. 0845 766 0163; website: [www.mind.org.uk](http://www.mind.org.uk)

**MENTAL HEALTH FOUNDATION**

**Independent organisation that helps people to survive, recover from and prevent mental health problems**

9th floor, Sea Containers House, 20 Upper Ground, London SE19QB

Tel. 020 78031100; website: [www.mentalhealth.org.uk](http://www.mentalhealth.org.uk)

This is the biggest website on mental health (and mental illness) in the UK.

**Samaritans**

**National organisation offering support to those in distress who feel suicidal or despairing and need someone to talk to.**

The telephone number of your local branch can be found in the telephone directory.

The 24-hour Helpline: 08457 90 90 90; website: [www.samaritans.org.uk](http://www.samaritans.org.uk)

**Depression Alliance**

**Information, support and understanding for people who suffer with depression and for relatives who want to help.**

35 Westminster Bridge Road, London SE1 7JB

Tel: 0845 123 23 20; website: [www.depressionalliance.org/](http://www.depressionalliance.org/)

**Fellowship of Depressives Anonymous**

**A national mutual support group for people suffering from Depression**

Box FDA, Self-Help Nottingham, Ormiston House, 32-36 Pelham Street, Nottingham NG1 2EG Tel: 0870 774 4320; website: [www.depressionanon.co.uk](http://www.depressionanon.co.uk)

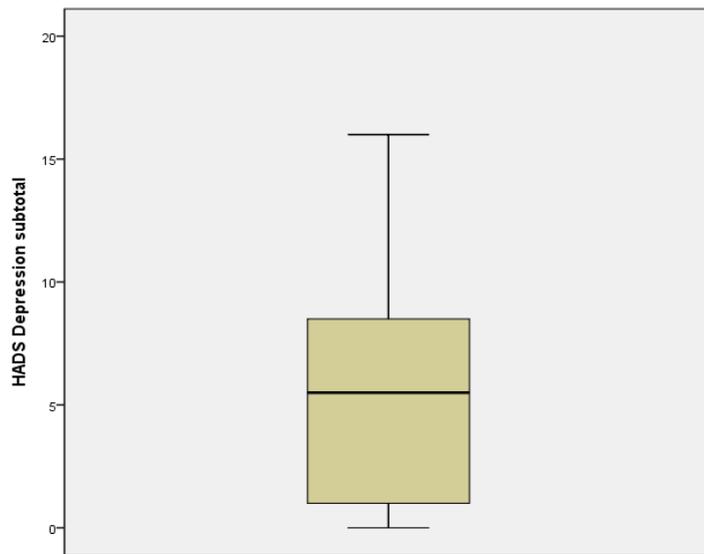
**RELATE**

**UK's largest and most experienced relationship counselling organisation**

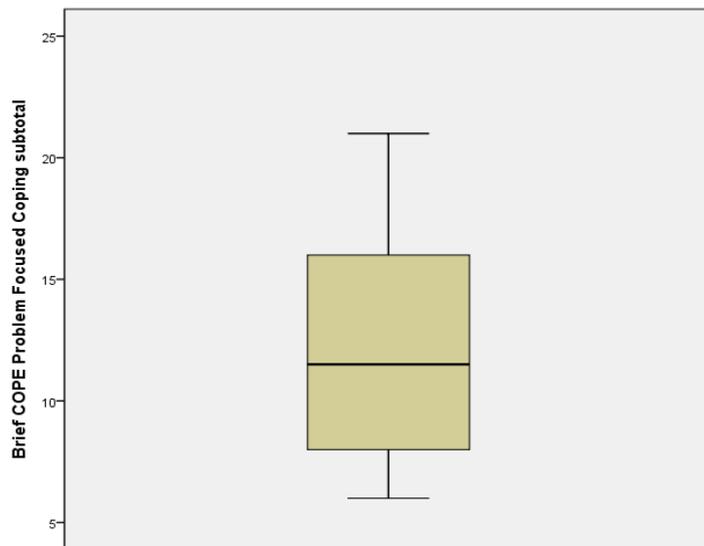
Herbert Gray College, Little Church Street, Rugby CV21 3AP

Tel: 0845 456 1310; website: [www.relate.org.uk](http://www.relate.org.uk)

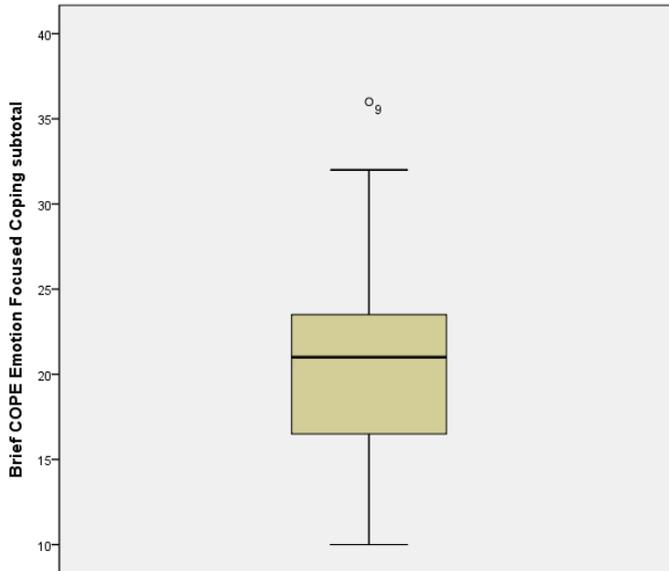
**Appendix U: Figures of the distribution of score for each measure**



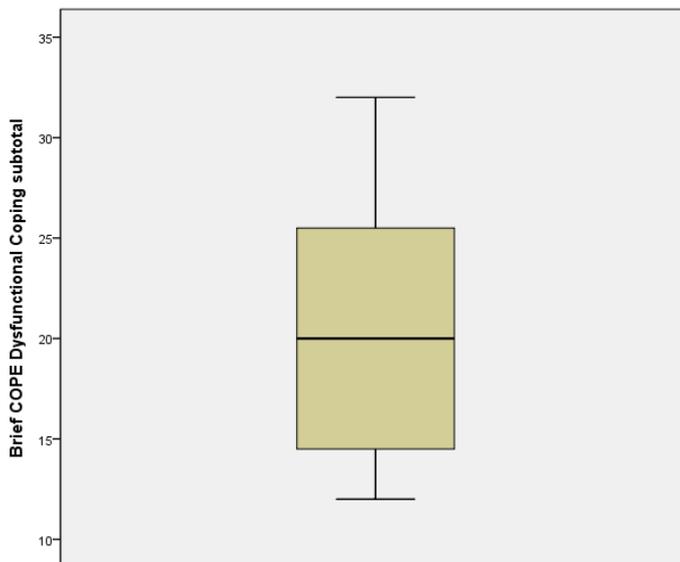
***Figure 1. Scores of the depression subscale of the HADS.***



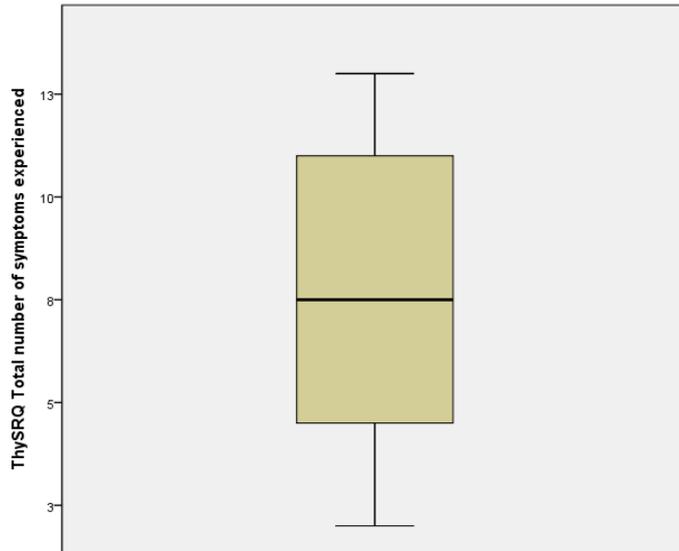
***Figure 2. Scores on the problem focused coping subscale of the Brief COPE***



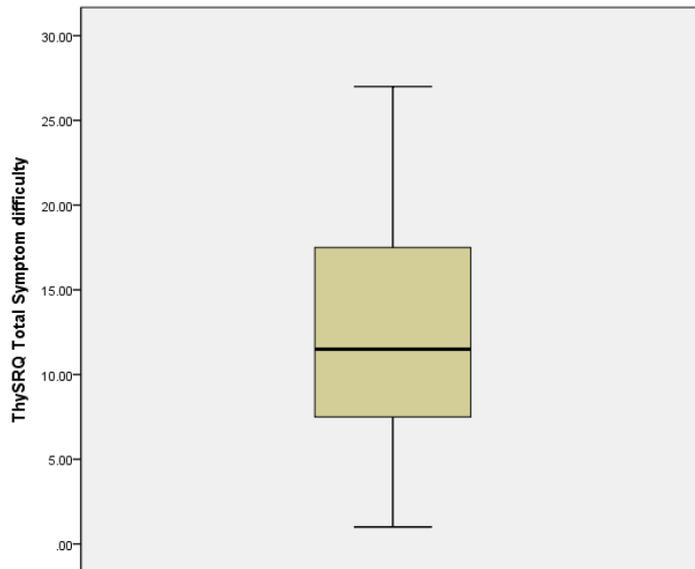
**Figure 3. Scores on the emotion focused coping subscale of the Brief COPE**



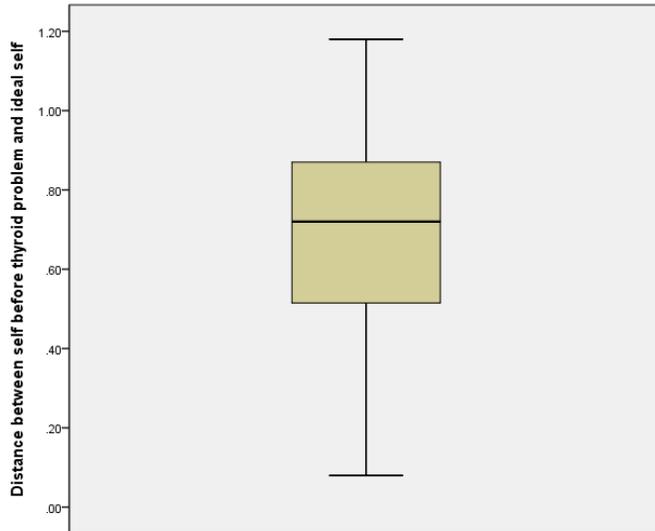
**Figure 4. Scores on the dysfunctional coping subscale of the Brief COPE**



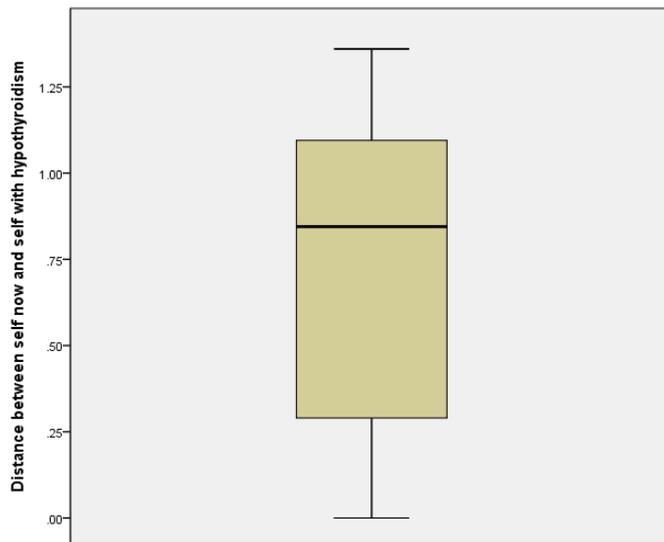
**Figure 5. Scores on the ThySRQ number of symptoms total**



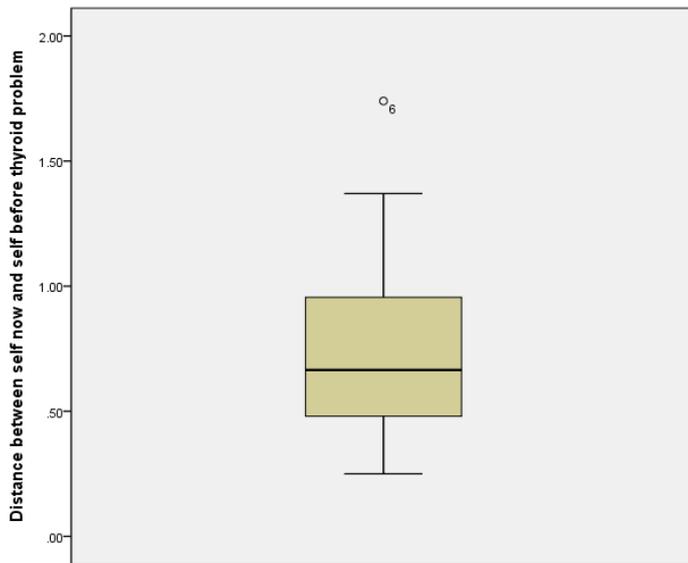
**Figure 6. Scores on the ThySRQ symptom difficulty total**



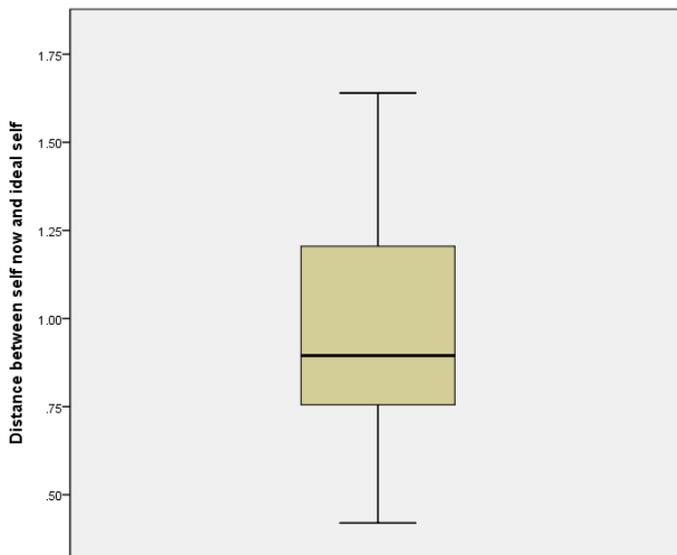
**Figure 8. Score for distance between self before hypothyroidism and ideal self**



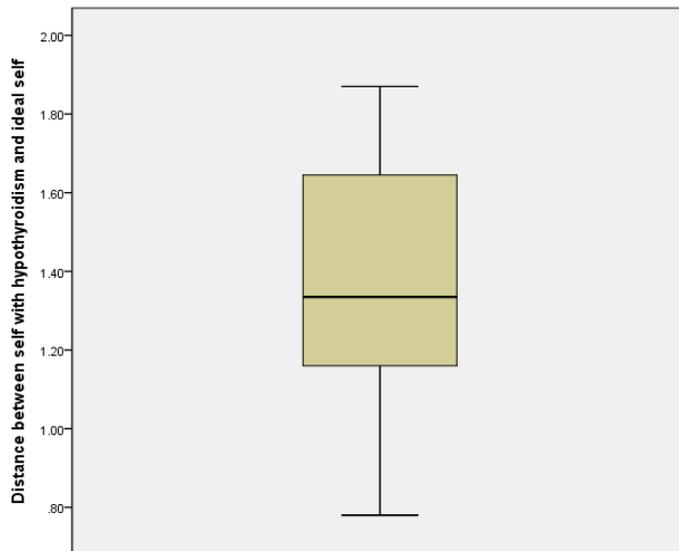
**Figure 9. Score for distance between self now and self with hypothyroidism**



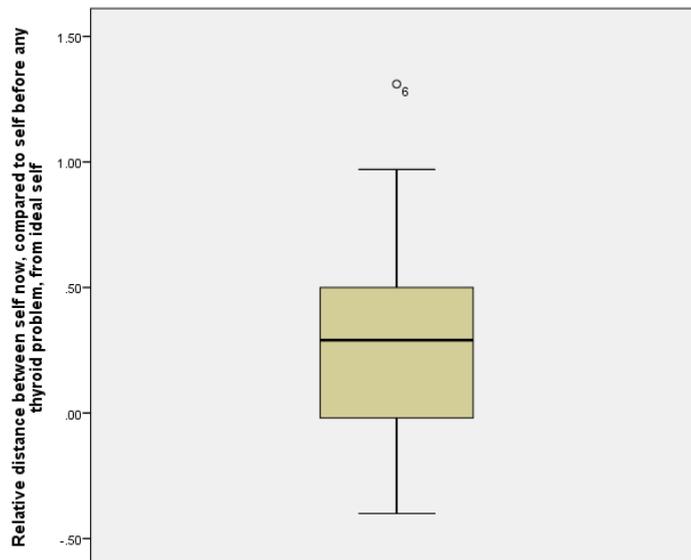
**Figure 10. Score for distance between self now and self before a thyroid problem**



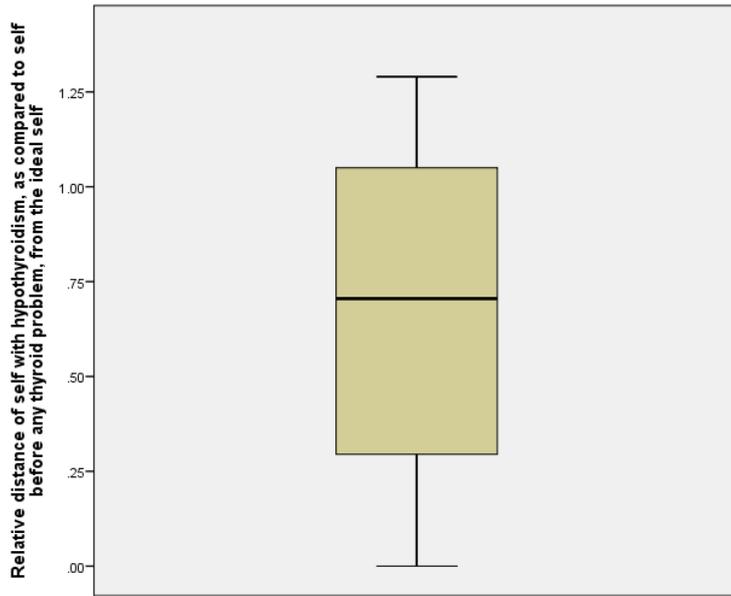
**Figure 11. Score for distance between self now and self with hypothyroidism**



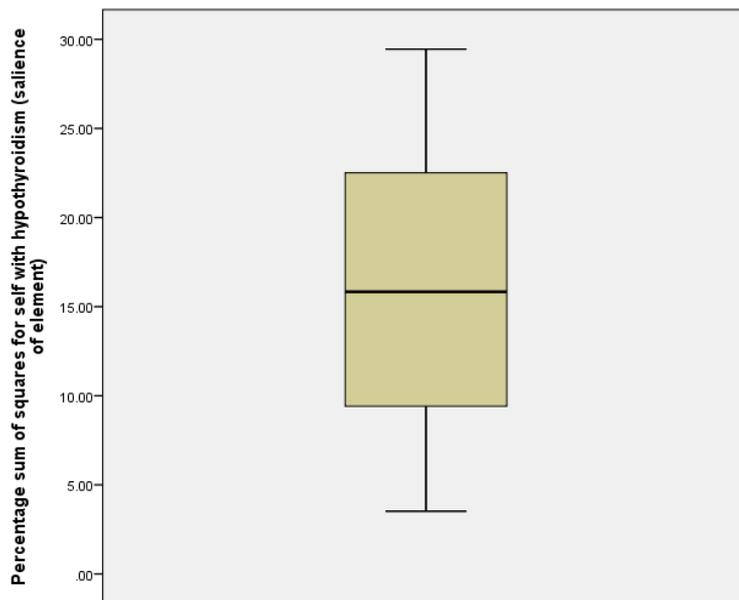
**Figure 12. Score for distance between self with hypothyroidism and ideal self**



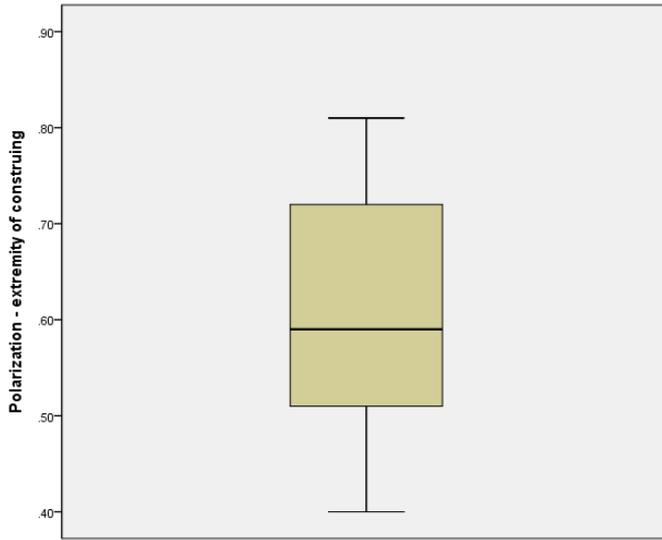
**Figure 13. Score for relative distance between self now, compared to self before a thyroid problem, from ideal self**



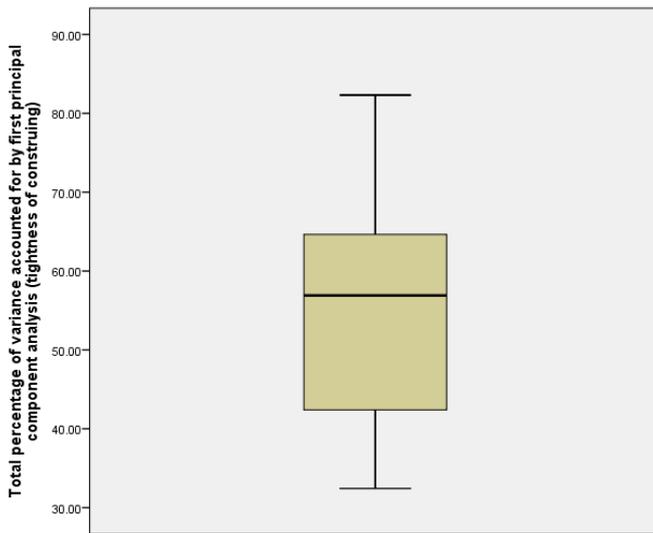
**Figure 14. Score for relative distance between self with hypothyroidism, compared to self before a thyroid problem, from ideal self**



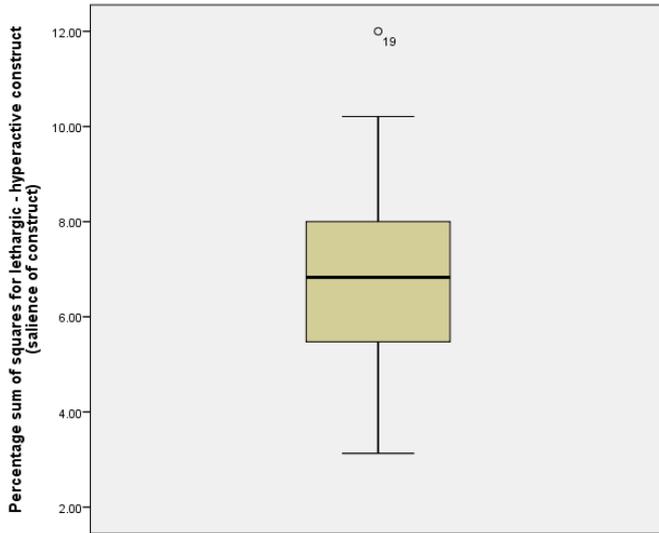
**Figure 15. Score for superordinacy of self with hypothyroidism element**



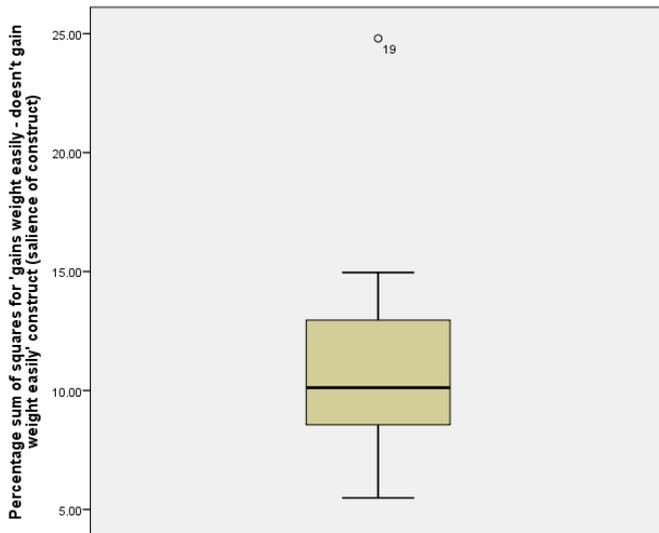
**Figure 16. Scores of polarization**



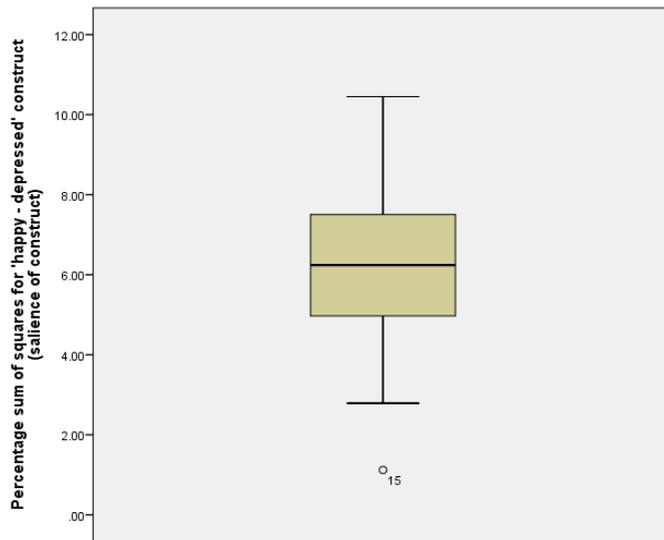
**Figure 17. Scores of the tightness of construing**



**Figure 18. Scores for the superordinacy of the 'hyperactive-lethargic' construct**



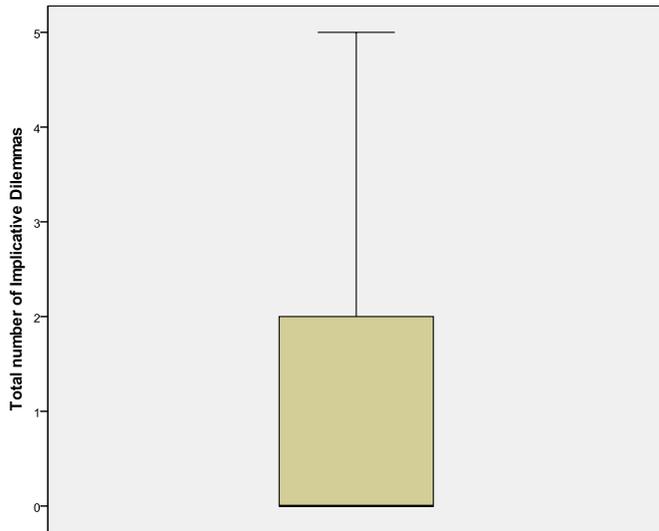
**Figure 19. Scores for the superordinacy of the 'gains weight easily – doesn't gain weight easily' construct**



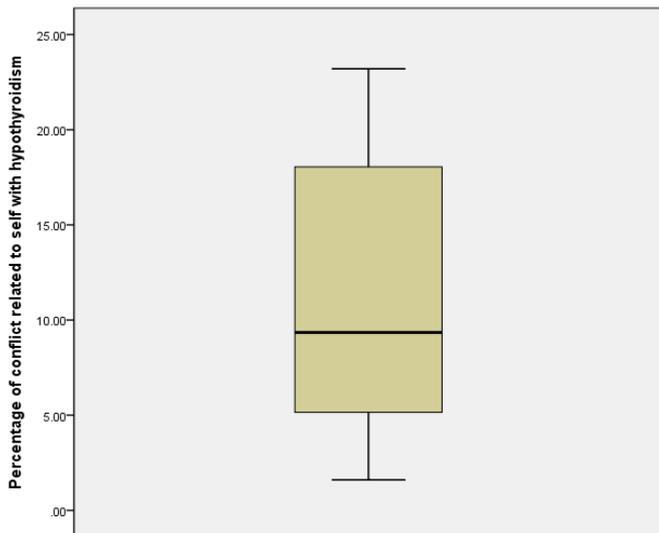
**Figure 20. Scores for the superordinacy of the 'depressed – happy' construct**



**Figure 21. Scores for the percentage of implicative dilemmas**



**Figure 22. Scores for the total number of implicative dilemmas**



**Figure 23. Scores for percentage of conflict related to self with hypothyroidism**

**JOURNAL READY COPY OF  
“PERSONAL CONSTRUCTS IN SECONDARY HYPOTHYROIDISM”**

**SARAH MACLEAN**

**WORD COUNT: 4999**

**AUGUST 2011**

# Personal constructs in secondary hypothyroidism

Sarah Maclean

**Objective.** To examine the relationship between personal constructs, coping, depression and persistent physical symptoms in patients with treated secondary hypothyroidism.

**Design.** Cross-sectional. It was hypothesized that differences in how the person construed themselves with hypothyroidism and the styles of construing that they used would be related to coping, depression and hypothyroid symptoms.

**Method.** Twenty patients with secondary hypothyroidism completed a semi-structured interview (repertory grid) and self-report measures of coping, depression and hypothyroid symptoms.

**Results.** How unfavourably the self now was viewed compared to self before a thyroid disorder was positively correlated with depression, dysfunctional coping and hypothyroid symptoms. Polarized (i.e. black-and-white) construing and tight (i.e. rigid) construing were significantly and positively related to depression scores. Tightness of construing was also related to the number of hypothyroid symptoms experienced. Dysfunctional coping was positively correlated with depression and hypothyroid symptoms and those with a history of depression experienced significantly more hypothyroid symptoms. Exploratory multiple regression analyses uncovered that how unfavourably the person viewed themselves now compared with before any thyroid problem, hypothyroid symptom frequency and dysfunctional coping accounted for 82.9% of the variance in depression.

**Conclusions.** The way an individual construes having secondary hypothyroidism is related to worse physical and mental health and dysfunctional coping strategies. Psychological interventions may be helpful in adjusting to the disorder. Limitations include a small sample size and a correlational design.

Hypothyroidism occurs when thyroid hormone levels are below the normal range. These hormones are important for metabolism. Secondary hypothyroidism occurs after treatment for hyperthyroidism, such as radioactive iodine (RAI) treatment. Once a person becomes hypothyroid, it is a lifelong chronic condition (McMillan, Bradley, Razvi & Weaver, 2008). Symptoms include fatigue, cold sensitivity, impaired cognitive abilities and increased weight (British Thyroid A, 2007) and there is a high psychiatric morbidity, including depression (Aslan et al., 2005).

A number of people still experience symptoms of hypothyroidism when on the recommended replacement dosage of thyroid replacement hormone (Bunevicius & Prange, 2006). Saravanan et al. (2002) found that 48.6% of 397 patients with recent normal thyroid test showed significant psychological impairment. It has also been found that long-term quality of life is impaired (McMillan et al., 2008).

It is not clear whether persistent depression and physical symptoms are due to biological or psychosocial factors. Patients may have experienced depression when they were hyperthyroid (Bunevicius & Prange, 2006) and Coyne, Pepper and Flynn (1999) highlight a history of depression as the single biggest predictor of current depression. However, biased attention to bodily sensations has been found in people high in negative affectivity (Stegen et al, 2001), which could lead to more reports of physical symptoms. Stress has been found to impact on thyroid hormone levels (Bauer et al, 1994), which through biological mechanisms may lead to depressive symptoms. Symptoms may be stressful in themselves and it is important to consider how a person adjusts and copes with secondary hypothyroidism.

Lazarus and Folkman (1984) define coping as the way a person attempts to manage stressful events that are perceived as surpassing a person's resources. They distinguished problem-focused coping (where an individual attempts to do something about the stressor) and emotion-focused coping (where an individual tries to reduce the emotional aspects of the stressor). Other classifications include approach coping (active attempts to change or get rid of the stressor) or avoidance coping (passive styles which include strategies such as withdrawal or denial) (Suls & Fletcher, 1985). Generally, active problem focused coping strategies have been highlighted as a helpful for adaptation to physical health problems (Maes, Leventhal & de Ridder,

1996) and avoidance styles of coping have been associated with poorer outcomes in physical health (Taylor and Stanton, 2007). There is little research in coping with thyroid disorders but research on coping in chronic fatigue syndrome (CFS), which shares the complaint of fatigue, has shown that patients are more likely to use avoidant styles, such as behavioural disengagement, than healthy controls (Blakely et al., 1991). Ray, Jefferies and Weir (1995) found that avoidance styles of coping were positively related to fatigue, functional impairment and depression in CFS.

Maes et al. (1996) proposed a model of coping and adjustment, which included demographic details, social support, life events; cognitive appraisals of the illness as factors.

Illness representations are one way of conceptualising cognitive appraisals (Leventhal, Meyer & Nerenz, 1980). These are beliefs about the cause, identity, timeline, consequences and control of an illness. Dickson, Toft and Carroll (2009) found that treated primary hypothyroidism patients believed that their condition was long-term, but they had greater control over and were less concerned compared to the CFS group. These perceptions were not accounted for by mood, indicating that how the patient viewed their illness may have important consequences for adjustment. Sharpe, Sensky and Allard (2001) found that illness representations were causally related to depression.

It is also important to consider how a person views themselves with chronic illness. Leventhal, Leventhal and Cameron (2001) suggest that individuals who differentiate the self from a physical disease adapt better.

Further understanding of how a person views him or herself with hypothyroidism could be gained by using Personal Construct Theory (PCT). The fundamental assumption of PCT is that we try to anticipate events in the world based on our previous experiences (Kelly, 1955). Each person has constructs, which form hypotheses that are continually validated or invalidated based on how the person makes sense of an event (constructive alternativism), such as having a chronic illness.

Within PCT, psychological difficulties occur when an individual is unable to alter their constructions when there has been invalidation (Winter, 1992). Kelly (1955) described transition constructs, which look the processes that could occur if an individual is confronted with an event. 'Guilt' occurs when a person believes that that they are not interacting with others in ways that are important to them (Kelly, 1955). This could lead to a loss of an authentic self. 'Threat' occurs when a person's core constructs about themselves and the world are called into question. For example, there may be core constructs related to the self being seen as 'slim' but weight gain due to hypothyroidism might threaten this view. 'Anxiety' is thought to occur when an experience is encountered which a person's construct system is unprepared for. Dalton and Dunnet (1992) suggest that an individual may avoid threat and anxiety by narrowing their view of the experience, which would lead to tighter construing (rigid views). Button (1983b) suggests the role of being ill may provide predictability and avoid invalidation of the self constructions but tighter construing was related to poorer prognosis in anorexics (Button, 1983a). Tightness of construing has been found in people with depression (Sheehan, 1981), cancer (Turpin et al., 2011) and Irritable Bowel Syndrome (Benasayag et al., 2004, as cited in Feixas & Saul, 2004). Polarized or extreme construing has also been found in people with depression (Neimeyer et al., 1983).

Constructs can be used to make sense of different self aspects. Some self aspects may be more salient (important) than others. Rosenberg and Gara (1985) hypothesised that if a superordinate identity is threatened, individuals may move to another identity to avoid disruption.

Discrepancies have been found in the way depressed people construe themselves now compared to their ideal self (Feixas et al., 2008). This has also been found in fibromyalgia patients (Compan et al., 2011), which could indicate that the health condition has a negative impact on self identity. In a study of stroke patients, Skelley (2002) found that a large discrepancy between how the person construed themselves before the disorder and themselves currently was related to depression. This may indicate a loss of identity in chronic illness, leading to poorer outcomes.

Conflicts may occur within the construct system, e.g. changes in undesirable self-constructions would be resisted as they lead to changes in desirable self

constructions. The presence of these conflicts (implicative dilemmas) were significantly lower in control groups than psychotherapy patients (Feixas & Saul, 2003 in Feixas & Saul, 2004) and fibromyalgia patients (Compan et al., 2011). The authors also used a classification system (Feixas, Geldschlager & Neimeyer, 2002) to categorise the content of personal constructs. Moral and physical health areas were most common, which might imply that there are moral implications for changing the view of the self.

The study aims to explore the constructs of patients with secondary hypothyroidism and how this is related to coping, depression and hypothyroid symptoms.

## **Hypotheses**

### *1. Self construing and treated hypothyroidism*

d. The greater the relative distance of the self with hypothyroidism, as compared to the self before any thyroid problem, from the ideal self, the greater the number of hypothyroid symptoms and hypothyroid symptom difficulty, depression, and dysfunctional coping scores.

e. The greater the relative distance between the construal of self now, as compared to the self before any thyroid problem, from the ideal self, the greater the number of hypothyroid symptoms, hypothyroid symptom difficulty, depression, and dysfunctional coping scores.

f. The more salient the self with hypothyroidism is, the higher the depression, hypothyroid symptom frequency and hypothyroid symptom difficulty scores and dysfunctional coping scores.

### *2. Construct systems of treated hypothyroid patients*

f. Polarized and tight construing will be positively correlated with depression, hypothyroid symptom frequency, hypothyroid symptom difficulty scores and dysfunctional coping style.

g. Cognitive conflicts will be positively related to hypothyroid symptoms, depression and dysfunctional coping styles.

h. The more superordinate the supplied constructs related to hypothyroidism are (i.e. lethargic, depressed, gains weight more easily), the higher the depression, hypothyroid symptom frequency, hypothyroid symptom difficulty and dysfunctional coping scores.

i. The most common category of constructs used to construe the self with hypothyroidism will be physical health and emotional categories.

### 3. *Coping and hypothyroidism*

Higher dysfunctional coping scores will be related to higher depression and number of hypothyroid symptoms and hypothyroid symptom difficulty score.

### 4. *Depression and hypothyroid symptoms*

The higher the depression scores, the greater the number of hypothyroid symptoms and hypothyroid difficulty score.

### 5. *History of depression*

Those with a history of depression will have higher depression and symptom difficulty scores, greater number of hypothyroid symptoms and greater use of dysfunctional coping strategies.

## **METHOD**

### **Participants**

Participants were recruited from an Endocrinology Department at a National Health Service Hospital and through thyroid disorder support groups. The inclusion criteria for the study were: hypothyroidism had developed following RAI treatment, thyroid hormone levels in the normal ranges, 18-65 years old and been on the same dosage of thyroxine medication for three months to ensure medication has stabilised (BTA, 2006). Seven people who were attending or discharged from the endocrinology clinic took part out of the 19 people invited. Thirteen participants were recruited through advertising with British Thyroid Foundation (BTF), Thyroid UK and Thyroid Patient Advocacy. These participants completed the research through the website (all female). The final sample number was 20 participants (18 female and 2 male).

The mean age was 48.3 years (SD = 10.44) and 55% were employed full time. The mean duration of hypothyroidism was 5 years (SD = 5.22). 45% of the sample had other significant health problems, such as diabetes and 30% had a history of depression.

## **Measures**

*Demographic and medical information* was obtained, including age, gender, time since diagnosis, symptoms and history of depression. Participants recruited through support groups had missing data concerning thyroid hormone levels.

*Depression* was measured using the depression subscale of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The HADS has good psychometric properties (Bjelland, et al., 2002).

*Hypothyroid Symptoms* were measured using the Thyroid Symptom Rating Questionnaire (ThySRQ; McMillan et al., 2008). The participant must indicate if they experience the 15 symptoms presented and rate how much the symptom bothers them on a scale of 0 (not at all) to 3 (a lot). A total 'bother' score was not supported by a factor-analysis. However, exploratory analyses have shown that the difficulty rating related to each symptom had high internal consistency (Cronbach's alpha of 0.808). A total symptom difficulty score was included to explore of the perception of the impact of the symptoms. The total number of hypothyroid symptoms experienced was also used.

*Coping* was measured using the Brief COPE, which reports satisfactory psychometric properties (Carver, 1997). Participants rate 28 statements related to coping strategies on a scale of 1 (I usually don't do this at all) to 4 (I usually do this a lot). Items were grouped into emotion-focused coping, problem-focused coping and dysfunctional coping, and Cooper, Katona and Livingston (2008) highlight good internal consistencies for these scales (alpha = 0.72, 0.84, 0.75 respectively).

### *Repertory Grid Technique (Kelly, 1955)*

The repertory grid is a semi-structured interview used to elicit constructs from individuals related to specific areas of interest (e.g. how the person construes having hypothyroidism). The method asks the individual to consider elements such as self with hypothyroidism, self now as well as other people.

The constructs 'depressed-happy', hyperactive-lethargic' and 'gains weight easily-doesn't gain weight easily' were provided to explore how patients construe the symptoms of hyperthyroidism and hypothyroidism. Ten further constructs were elicited using Kelly's (1955) method by showing three element cards and asking "how are two of these alike and different from the third?" To obtain a bipolar construct, participants were asked 'what is the opposite for you?'. Constructs were then used as a scale, assigning 7 to one pole and 1 to the other and each element was rated on this scale.

#### *Measures extracted from the repertory grid*

Repertory grids were analysed using the Grice (2008) IDIOGRID programme to extract measures of self construing and the content and structure of the construct system. Distances between elements and constructs can be extracted and the relative distances can be calculated.

The larger the total percentage of variance accounted for by the first principal component in the principal component analysis, the more 'tightly' organised the construing. Variability related to the total sum of squares of the constructs is used as a measure of polarized construing. The percentage sum of squares for a construct or element indicates how important a construct or element is in the construct system (Bannister & Salmon, 1967; cited in Winter, 1992).

Implicative dilemmas are indicated by correlations between *congruent* constructs (where there is a discrepancy of less than 2 scale points between self now and ideal self) and *discrepant constructs* (a discrepancy of over 3 scale points between self now and ideal self). Conflict related to the self with hypothyroidism element was calculated using GRIDSTAT programme (Bell, 2004b). Bell (2004a) describes the measurement of conflict as an imbalance in the correlations between an element and two constructs (Bell, 2004a). The higher the percentage relating to one element, the more conflict is associated with this element.

The Classification System for Personal Constructs (CSPC; Feixas et al., 2002) was used to analyse the content of the constructs. This provides six hierarchically ordered categories: moral, emotional, relational, personal, intellectual/operational,

values and interests, existential, concrete descriptors and physical health (used in Compan et al., 2011). Feixas et al. (2002) report reliability indices over 0.90.

## RESULTS

### *Descriptive statistics for the depression, hypothyroid symptoms and coping measures*

Table 1 shows the descriptive statistics. The mean depression score fell below the cut off for clinical depression. Of note is that at least two symptoms were experienced by all participants.

**Table 1. Descriptive statistics for the HADS-depression subscale, ThySRQ and Brief COPE measures**

<b>HADS – depression subscale</b>	
Mean (SD)	5.5 (4.23)
Median	5.5
Min - Max	0-16
<b>ThySRQ – symptom difficulty</b>	
Mean (SD)	13.3 (7.76)
Median	11.5
Min – Max	1-27
<b>ThySRQ - Number of symptoms experienced</b>	
Mean (SD)	7.7 (3.34)
Median	7.5
Min-Max	2-13
<b>Frequency of hypothyroid symptoms</b>	
Tiredness	18
Gained weight	13
Felt colder	14
Constipation	10
Hair problems	7
Skin problems	8
Nail problems	11
Loss of appetite	2
Hearing problems	5
Voice problems	7
Speech problems	10
Memory problems	13
Difficulty concentrating	13 (2 missing)

Dizzy or light headed	10
Felt depressed or low	13
<b>Brief COPE</b>	
Dysfunctional coping	
Mean (SD)	20.45 (6.47)
Median	20
Min – Max	12-32

One-tailed Spearman's rho correlations were used unless otherwise specified. Two-tailed correlations were used for problem-focused and emotion-focused coping scores due to the conflicting findings between these styles of coping and outcome.

Mann-Whitney U tests showed that those recruited from the endocrinology clinic had lower depression scores ( $z = 1.759$ ,  $p = .039$ ), used less emotion focused coping (2 tailed,  $z = 2.226$ ,  $p = .026$ ), and used less dysfunctional coping ( $z = 2.103$ ,  $p = .0175$ ) than those recruited through support organisations. No significant correlations were found between demographic information and depression, hypothyroid symptoms and coping.

## Hypotheses

*The relationship between the self construal and depression, hypothyroid symptoms and coping*

Table 2 shows that the relative distance of self with hypothyroidism, compared with self before any thyroid problem, from ideal self significantly and positively correlated with depression scores ( $r_s = .421$ ;  $p = .032$ ). The relative distance of self now, compared with self before any thyroid problem, from ideal self was significantly and positively correlated with depression scores ( $r_s = .672$ ;  $p = .001$ ), dysfunctional coping scores ( $r_s = .478$ ;  $p = .016$ ), hypothyroid symptom difficulty ( $r_s = .447$ ;  $p = .024$ ) and number of hypothyroid symptoms ( $r_s = .394$ ;  $p = .043$ ). No significant correlations were found for the salience of self with hypothyroidism.

**Table 2. Correlations (Spearman's Rho) between self construing and depression, hypothyroid symptom difficulty and coping**

	Relative distance of self with hypothyroidism, compared to self before any thyroid problem, from ideal self	Relative distance of self now, compared to self before any thyroid problem, from ideal self	Saliency of self with hypothyroidism
<b>HADS depression subscale</b>			
$r_s$	.421	.672	.350
Sig. (1 tailed)	.032	.001	.065
<b>Dysfunctional coping</b>			
$r_s$	.241	.478	.329
Sig. (1 tailed)	.153	.016	.078
<b>Problem-focused coping</b>			
$r_s$	.081	-.054	.336
Sig. (2 tailed)	.734	.822	.168
<b>Emotion-focused coping</b>			
$r_s$	.023	-.224	-.133
Sig. (2 tailed)	.922	.342	.574
<b>Hypothyroid Symptom Difficulty</b>			
$r_s$	.189	.447	.335
Sig. (1 tailed)	.212	.024	.074
<b>Number of Hypothyroid Symptoms experienced</b>			
$r_s$	.346	.394	.358
Sig. (1 tailed)	.067	.043	.061

*Structure, inconsistencies and content of the construct system and depression, coping and hypothyroid symptom difficulty*

As Table 4 shows, polarization of construing was significantly and positively correlated with depression scores ( $r_s = .469$ ;  $p = .018$ ), as was the tightness of construing ( $r_s = .417$ ;  $p = .034$ ). Tightness of construing was also significantly

correlated with the number of hypothyroid symptoms experienced ( $r_s = .414$ ,  $p = .035$ ).

**Table 4. Correlations (Spearman's Rho) between structure of the construct system and depression, hypothyroid symptom difficulty and coping**

	Polarization of construing	Tightness of construing
<b>HADS depression subscale</b>		
$r_s$	.469	.417
Sig. (1 tailed)	.018	.034
<b>Dysfunctional coping</b>		
$r_s$	.287	.210
Sig. (1 tailed)	.110	.187
<b>Problem-focused coping</b>		
$r_s$	.227	.048
Sig. (2 tailed)	.704	.84
<b>Emotion-focused coping</b>		
$r_s$	.321	.100
Sig. (2 tailed)	.168	.676
<b>Hypothyroid Symptom Difficulty</b>		
$r_s$	.157	.215
Sig. (1 tailed)	.255	.181
<b>Number of Hypothyroid Symptoms experienced</b>		
$r_s$	.231	.414
Sig. (1 tailed)	.164	.035

No significant correlations were found between conflict in the construct system and depression, hypothyroid symptom and coping scores. The only significant correlation between the importance of the supplied constructs and the other scores was a positive correlation between the superordinacy of the happy - depressed construct and the problem focused coping subscale. Therefore, the more important being depressed or happy is in the individual's view of the world, the greater the use of problem focused coping.

The total number of constructs applied to self with hypothyroidism using an extreme rating (i.e. 1 or 7) was 63. The agreement rate between two raters on categorisation of constructs was 70.4%. The analysis showed that most common categories that were applied with extreme ratings to self with hypothyroidism were the physical category (38.1%) and the emotion category (20.6%). This was followed by the relational (9.5%) and personal (9.5%) categories. After the physical category, the most used subcategory was 'introverted'. The construct poles used to describe the self with hypothyroidism were self conscious (versus confident), reserved (versus outgoing), quiet (versus flamboyant) insular (versus outgoing) and inhibited (versus free).

#### *Dysfunctional coping and depression and hypothyroid symptoms*

Dysfunctional coping was significantly and positively correlated with depression ( $r_s = .824, p < .001$ ), hypothyroid symptom difficulty ( $r_s = .542, p = .007$ ) and number of hypothyroid symptoms experienced ( $r_s = .491, p = .014$ ). No significant correlations were found for emotion-focused and problem-focused coping.

#### *Depression and hypothyroid symptoms*

It was found that depression was significantly and positively correlated with hypothyroid symptom frequency ( $r_s = .744, p < .001$ ) and hypothyroid symptom difficulty ( $r_s = .708, p = <.001$ ).

#### *Exploratory multiple regression analyses*

To explore the possible predictors of depression and thyroid symptom frequency, multiple regression analyses were conducted. The final model for depression can be seen in Table 5. The model accounted for 82.9% of the variance and all three predictors were significant, indicating it is a reliable model.

**.Table 5. Multiple regression analysis of dysfunctional coping, hypothyroid symptom frequency, and relative distance of self now, compared with self before any thyroid problem, from ideal self on depression scores.**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Dysfunctional coping	.268	.400	3.581	.002
Relative distance of self now, compared with self before any thyroid problem, from ideal self on depression.	4.314	.412	3.775	.002
Hypothyroid symptom frequency	.459	.355	3.143	.006

Adjusted  $R^2 = .829$ ,  $F(2, 17) = 31.717$ ,  $p < .001$

Table 6 shows the model for hypothyroid symptom frequency accounted for 47.9% of the variance. However, depression was the only significant predictor.

**Table 6. Multiple regression analysis of dysfunctional coping and depression on hypothyroid symptom frequency**

<b>Independent variable</b>	<b>B</b>	<b>Beta</b>	<b>T</b>	<b>P</b>
Dysfunctional coping	-.069	-1.34	-.545	.593
Depression	.637	.824	3.345	.004

Adjusted  $R^2 = .479$ ,  $F(2, 17) = 9.734$ ,  $p = .002$

*Differences between those with a history of depression and those without*

Mann-Whitney U tests were performed to examine if those who had a history of depression ( $n = 6$ ) differed from those who do not have a history of depression ( $n = 14$ ) in current depressive symptoms, hypothyroid symptom difficulty and coping (Table 7).

**Table 7. Differences between those with history of depression and those without a history of depression on depression, hypothyroid symptom and coping scores.**

<b>N= 20</b>	<b>Z =</b>	<b>P =</b>
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<b>HADS depression score</b> (Significance 1 tailed)	1.373	.089
<b>Dysfunctional coping subscale</b> (Significance 1 tailed)	.290	.386
<b>Problem-focused coping subscale</b> (Significance 2 tailed)	1.655	.098
<b>Emotion-focused coping subscale</b> (Significance 2 tailed)	.826	.409
<b>Hypothyroid symptom difficulty</b> (Significance 1 tailed)	1.322	.093
<b>Number of hypothyroid symptoms experienced</b> (Significance 1 tailed)	1.871	.03

Table 8 shows that those who had a history of depression experienced a significantly greater number of hypothyroid symptoms (median = 9.83) than those without a history of depression (median = 6.79).

## DISCUSSION

### *Self construing*

The more favourably the individual construes the self before any thyroid disorder compared with the self with hypothyroidism, the more depressed the person is. As the patient is unable to return to a self before any thyroid disorder, 'guilt' may occur as they are not interacting with others in ways which are characteristic of them (Kelly, 1955) and the result would be in line with Skelley's (2002) findings. No significant relationships were found with coping or hypothyroid symptom difficulty. It may be that people hypothyroidism as a past experience and current coping strategies are not relevant.

The more favourably the individual construes the self before any thyroid disorder compared with the self now, the more depressed the person is. This may show less

adjustment to hypothyroidism. Interestingly, this was more strongly correlated with depression ( $r_s = .672$ ) than the relative distance involving self with hypothyroidism ( $r_s = .421$ ). Therefore, self now may be more important for this sample. The large changes in the way people construe the self before and after developing hypothyroidism could relate to a loss of self, as has been found in chronic health problems (Charmaz, 1983). However, it may be that due to the current depression they are experiencing they view a past view of themselves more positively. The more negative the view of the self now compared to self before a thyroid disorder was related to greater dysfunctional coping strategies. People may use strategies such as avoidance, which stops them from developing a sense of self beyond having a thyroid condition. The more positively patients viewed self before any thyroid disorder compared with self now, the greater the hypothyroid symptoms frequency and more difficulty with these symptoms. James and Large (1992) and Skelley's (2002) found that people who construe themselves now as similar to self before a chronic health problem have better physical health outcomes.

There was a trend towards higher depression scores in those people for whom self with hypothyroidism was important in their construct system ( $r_s = .350$ ,  $p = .065$ ), which may indicate that the disease and self may be less differentiated leading to poorer outcomes (Leventhal et al., 2001).

#### *Features of the construct system*

Those patients who used more extreme ratings had higher depression scores in line with Neimeyer (1983). The more tightly organised the construct system, the higher the hypothyroid symptoms and depression scores. A tighter construct system helps protect the person from 'threat' to the core self construction, which gives some support that symptoms may become a predictable way of viewing the world (Button, 1983b).

No significant correlations were found between implicative dilemmas and depression, coping or hypothyroid symptoms. Sheehan (1981) found less conflict within the grids of depressive patients compared with non-depressed controls and suggested that a tightly organised construct system reduces incompatibilities. There was a trend towards higher depression scores when the percentage of conflict for self with

hypothyroidism was higher ( $r_s = .336$ ,  $p = .056$ ). The conflict with the element may prevent this identity from becoming elaborated, which may lead to distress. It would have been useful to explore the conflict related to self now as the self with hypothyroidism identity may have been used temporarily (Rosenberg & Gara, 1985).

The more important the construct 'happy-depressed' is for the person, the more they use problem-focused coping. No other significant correlations were found with the supplied constructs. The lack of findings may be due to people using their words to describe their symptoms, which may be more meaningful (Fransella et al., 2004).

The self with hypothyroidism was rated in extreme terms in relation to physical health and emotional constructs. The use of the physical category is in line with Compan et al.'s (2011) study and may reflect the medical model in describing quality of life by physical symptoms. Self with hypothyroidism was seen as introverted. Viney (1989) found social exclusion was a prominent theme in people with health conditions.

#### *Dysfunctional coping*

The strong relationships between dysfunctional coping and depression and hypothyroid symptoms suggests that avoidance styles of coping are unhelpful in adjustment. These results are in line with the research (Ray et al., 1995; Taylor & Stanton, 2007).

#### *Depression scores and hypothyroid symptoms*

Significant correlations were found between depression and hypothyroid symptoms. It may be that the presence of hypothyroid symptoms may lead a person to feel more depressed although it is also possible that depression increases the person's awareness of physical symptoms (Stegen et al., 2001).

#### *History of depression*

Those with a history of depression had significantly more hypothyroid symptoms currently than those without a history of depression. Previous depression may predispose someone to difficulties when changes occur in the person's health. There

was a trend towards those with a history of depression having higher current depression scores, which would be in line with Coyne et al. (1999).

### *Predictors*

Multiple regression analyses showed that the appraisals of, and coping with, an illness are important to adjustment in line with Maes et al.'s (1996) model.

### **Limitations**

The study used a cross-sectional correlational design, which limits the interpretations that can be made from the results. Retrospective accounts of self before any thyroid disorder may have been biased by current difficulties. The small sample size reduced the statistical power in detecting significant relationships between variables or differences between groups. Analyses showed that there were significant differences between the recruitment sites, which may have been a confounding factor. However, the group sizes were too small to conduct analyses according to recruitment site. Many of the participants did not know if hormone levels were normal. Therefore subtle imbalances may have accounted for the symptoms.

The rate of agreement between judges is lower than stated for the CSPC (Feixas et al., 2002) possibly due to the lack of training in use of the system. The 'total' symptom bother or difficulty score created from the ThySRQ was not fully supported (McMillan et al., 2008). Therefore results with this variable should be treated tentatively.

Type 1 errors may have occurred in the study due to the multiple significance tests used.

### **Clinical Implications**

Psychological interventions may be helpful for some individuals with persistent difficulties and could be explored as alternative constructions of the self that may be less related to the presence of symptoms. Less dysfunctional coping strategies may be

helpful. Graded activity and mental engagement have been shown to be effective with CFS patients (Deale, Chalder, Marks & Wessely, 1997) and further research could investigate this with hypothyroid patients.

### **Suggestions for future research**

Further research would benefit from a larger sample size. Obtaining information on thyroid hormone levels would mean that both psychological and biological factors could be explored as predictors of persistent symptoms. Longitudinal study could provide information about how patients' construing changes the course of the condition. Data could be collected on current functioning and social support as previous research has highlighted this can buffer against distress in physical disease (Cohen, 1988).

### **Conclusions**

The way a person construes themselves with hypothyroidism and dysfunctional coping was related to depression and increased hypothyroid symptoms. Depression and hypothyroid symptoms were strongly related and those with a history of depression had a greater number of hypothyroid symptoms. Psychological factors are important in the experience of secondary hypothyroidism. However, the study was limited by the cross-sectional correlational design.

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