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Paruresis (psychogenic inhibition of micturition): Cognitive behavioural formulation
and treatment

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SHORT TITLE: Paruresis Formulation and Treatment

KEYWORDS: Cognitive Therapy, Behavior Therapy, Formulation

Abstract

Paruresis is a condition characterised by difficulty or inability to urinate in situations where others are present, or may soon be present. Despite knowledge that paruresis can significantly impact on occupational functioning, social functioning, and quality of life, there exists a paucity of research into effective treatments. Although cognitive conceptualisations have been advanced for other anxiety disorders, there has not been a comprehensive cognitive behavioural model of paruresis. This paper presents a revised cognitive and behavioural conceptualisation of paruresis, drawing on empirical evidence from other anxiety disorders. Using this conceptualisation, a cognitive-behavioural intervention strategy is outlined, with clear targets for cognitive and behavioural strategies.

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Introduction

Paruresis refers to the inability to initiate or sustain effective urination (micturition) in situations where there is a perception of scrutiny, or potential scrutiny, by others. It is associated with significant distress, impairment of social and occupational functioning, and reduced quality of life (Vythilingum et al., 2002; Soifer et al., 2001; Brandt et al., 1994). The condition was first described by Williams and Degenhardt (1954) who conducted a survey of paruresis symptoms in over 1400 university students. Paruresis is distinct from conditions such as Hinman syndrome, hysterical urinary retention, psychogenic urinary retention, and other conditions in which the individual presents with a chronic inability to pass urine, unrelated to the presence or attention of others (Malouff and Lanyon, 1985).

A slightly different definition of paruresis was offered by Vythilingum et al. (2002). These authors described paruresis as "...fear of not being able to urinate in public bathrooms or in situations in which others may be aware that the subject is urinating" (p84). This re-definition is noteworthy for two reasons: Firstly, it shifts the focus from the *inability* to micturate to the *fear that one may be unable* to pass urine. Secondly, it emphasises the role of the attention or awareness of others. This revised definition of paruresis has been considered in development of the conceptualisation offered in this review.

Research interest into psychological problems of micturition has grown steadily until the end of the 20th century. Although there has been some decline in research into chronic forms such as psychogenic urinary retention, research in

paruresis has remained relatively constant since the mid-1980s. Despite this research interest, there is no comprehensive theoretical model of paruresis that can be used to inform treatment. While other anxiety disorders have benefited from a cognitive-behavioural reconceptualisation (e.g. Rapee and Heimberg, 1997; Clark, 1986; Clum and Knowles, 1991; Boschen, 2007; Boschen and Oei, in press), such a reformulation has not been reported for paruresis.

The aim of this paper is to present a synthesis of previous research into paruresis, and to utilise this information to devise a comprehensive re-formulation of the disorder. This cognitive-behavioural conceptualisation of paruresis is then used to propose a cognitive-behavioural intervention program that is founded on evidence-based treatment principles.

Clinical Presentation of Paruresis

General Presentation

Individuals with paruresis report significant difficulty in initiating and/or sustaining urination in situations where they perceive scrutiny of their actions (e.g. being seen or heard to urinate) or the consequences of their actions (e.g. another person entering a lavatory that they have just used). Significant subjective anxiety may or may not be present during attempts at micturition (Hammelstein et al., 2003). Paruresis is not directly related to contamination concerns as seen in OCD and although medical complications may be present, these are an etiological factor in less than 10% of individuals (Vythilingum et al., 2002)

The stimuli associated with inhibition of micturition in paruresis are varied, but include increased numbers of people present, closer physical proximity to others, and the type of urinal being used (Malouff and Lanyon, 1985; Ascher, 1979). Most

individuals with paruresis find urination most difficult when they know that another individual is waiting to use the same facility. More than two-thirds of paruretic individuals are able to urinate at a friend's house (Vythilingum et al., 2002), although 15% percent report difficulty even in their own home (Anderson, 1977; Ascher, 1979; Vythilingum et al., 2002).

Similarly to other anxiety disorders, individuals with paruresis may attempt to use a range of coping behaviours to assist them in managing their disorder and its consequences. Behaviours such as restricting fluid intake, particularly of diuretics (e.g. caffeinated and alcoholic beverages, foods, medications), may be used to reduce the probability/frequency of micturition. Paruresis may also lead people to avoid social situations such as theatres and restaurants out of concern that they may need to urinate while there. When individuals with paruresis are willing to use public toilet facilities, they may engage in other behaviours such as the use of cubicles (rather than urinals), or choosing quiet, less busy lavatory facilities (Anderson, 1977). Individuals with paruresis often also report a moderate or severe degree of embarrassment or shame associated with their symptoms (Vythilingum et al., 2002). In all cases, the exact presentation varies depending on nature of patient's concerns (Ascher, 1979). Draft diagnostic criteria for paruresis are presented in Table 1.

Paruresis can impact significantly on daily activities and quality of life. Vythilingum et al. (2002) investigated the impact of paruresis symptoms of several daily activities, including employment, travel, social relationships and intimate relationships. Over one third reported an impact of their symptoms on their social activity, while over half reported that it had led to adverse consequences for their work and career (e.g. turning down jobs). Paruresis interferes with daily life (Hammelstein and Soifer, 2005) and leads to reduced quality of life (Soifer et al.,

2001). At its most extreme, paruresis can be associated with medical complications in up to 10% of cases (Vythilingum et al., 2002). Significant medical complications such as urosepsis may result from abnormally inhibited micturition behaviour (Brandt, et al., 1994).

There have been widely varied reports of prevalence rates for paruresis, depending on criteria and thresholds used, as well as the method of diagnosis. In the seminal report by Williams and Degelhardt (1954), the authors found a point-prevalence rate in a sample of college students of 14%. Malouff and Lanyon (1985) report that previous research has found paruresis to be “quite common” (p225), and in an exploratory study of 381 university students located 22 individuals with paruresis, calculating the point-prevalence to be 6.5%. Kaufman (2005) reported prevalence rates ranging from 7-32%, based on a review of the paruresis literature. More recently, Hammelstein et al. (2005) used the Paruresis Checklist (PCL) to ascertain the level of clinically significant paruretic symptoms in a representative male sample. Using a statistically determined cut-off score on the PCL, these researchers estimated that the point-prevalence of paruresis in the male population is approximately 2.8%.

Very little is known of the aetiology and course of paruresis (Hammelstein and Soifer, 2006). Similarly to many other disorders, paruresis often has its onset in adolescence. In a sample of 16 individuals with paruresis, the most common age of onset reported was between 12 and 15 years (Malouff and Lanyon, 1985). One early research paper has highlighted the importance of psychological distress and interpersonal conflict occurring at the onset of paruretic symptoms (Straub, Ripley and Wolf, 1949). The limited data available seem to suggest that paruresis follows a heterogenous course, varying across individual presentations. Vythilingum et al. (2002) reported that of their sample of individuals with paruresis, an intermittent

course was most common, occurring in 36.5%. Alternatively, 28.6% reported a stable course, 27.0% reported an improvement in symptoms since onset, while symptoms had worsened in 7.9%.

Despite the impact on quality of life and daily activities, the majority of individuals with paruresis do not seek professional assessment or treatment. In their recent investigation of the relationship between paruresis and social anxiety, Vythilingum et al. (2002) reported that in a sample of 63 individuals with paruresis, over half of these had never had a medical assessment of their problems. Furthermore only 37.7% of this sample had ever received a diagnosis from a health professional, and such a diagnosis only occurred after a mean of 14 years of symptoms. In those who do present for treatment, the overwhelming majority (around 90%) are male (Soifer et al., 2001).

Paruresis is commonly comorbid with other psychological conditions. Nearly half of the individuals with paruresis report at least one other psychological condition. Common comorbid psychological disorders include social anxiety (28.6%), depression (22.2%), alcohol problems (14.3%), and to a lesser extent, obsessive compulsive disorder (4.8%; Vythilingum et al., 2002). It is particularly noteworthy that over one half of the individuals surveyed by Vythilingum et al. denied any other psychological disorder.

There is some difficulty in ascertaining whether paruresis shows a higher prevalence rate in first-degree relatives of other paruretic individuals. This difficulty arises out of the wide variation in prevalence rates reported earlier. In the one study to investigate the prevalence rate of paruresis in family members, Vythilingum et al. (2002) reported that 16% of individuals had at least one family member they knew of with the same problem.

Gender Differences

Many studies examining the prevalence and nature of paruresis have used male samples (e.g. Malouff and Lanyon, 1985; Hammelstein et al., 2005). There is limited information about differences in presentation between males and females with paruresis. Rees and Leach (1975) examined male-female differences in presentation of paruresis, finding that males appear more concerned about visual privacy, while women are more likely to be concerned that they will be heard while urinating. On standard measures of social anxiety symptoms women outscore men on most symptoms, whereas urinating in a public restroom is one of very few symptoms scored higher by men than women (Turk et al., 1998).

Relationship with Social Anxiety Disorder

The relationship between paruresis and other anxiety disorders remains uncertain. Two general hypotheses have been forwarded in the literature: The first of these is the most common conceptualisation which views paruresis as a variant, subtype or symptom of social anxiety disorder (e.g., APA, 2000). The second of these, and the formulation that is promoted herein, is that paruresis shares common symptoms with anxiety conditions such as social phobia, but is a distinct condition. Evidence for each of these conceptualisations is presented below.

Paruresis as Social Anxiety Disorder

Paruresis is often introduced as a subtype or symptom of social anxiety disorder (e.g. APA, 2000; Hammelstein et al., 2005; Bohn and Sternbach, 1997). This view has considerable intuitive appeal, with paruresis triggered in social situations

where other people are present, or soon to be present. Comorbidity between social anxiety disorder and paruresis has been reported to be approximately 28.6% (Vythilingum et al., 2002). Individuals with paruresis are known to show elevated levels of anxiety and avoidance symptoms (Malouff and Lanyon, 1985), social anxiety symptoms (Hammelstein et al., 2005), body shyness (Gruber and Schupe, 1982), and fear of negative evaluation (Hammelstein and Soifer, 2006). Vythilingum et al. (2002) have argued that paruresis is a form of performance anxiety, as often seen in social anxiety disorder. This view is supported by empirical work by Malouff and Lanyon (1985) who found paruretics and non-paruretics to differ on performance anxiety and interpersonal anxiety, but not a host of other demographic and psychological variables.

Paruresis as an Independent Psychological Disorder

The classification of paruresis as a variant, subtype or symptom of social anxiety disorder has recently been questioned by Hammelstein and Soifer (2006). Evidence for the independence of paruresis comes from several areas such as incomplete overlap with social anxiety disorder, the independence of paruresis symptoms, and differences in treatment response between the two conditions.

Comorbidity between paruresis and social anxiety disorder is insufficient to support a conceptualisation of paruresis as a variant of social anxiety disorder. In an internet survey based on the Anxiety Disorders Interview Schedule and self-report measures, Hammelstein and Soifer (2006) assessed for the presence of social anxiety disorder and paruresis. In their sample, only 25% of individuals with paruresis were also found to have social anxiety disorder. Although this data was obtained by self-report over the internet, it is consistent with earlier research that has reported

comorbidity between the two disorders as 28.6%. Approximately half of individuals with paruresis do not meet criteria for any other Axis I disorder (Vythilingum et al., 2002).

Further support for the independence of paruresis from social anxiety disorder can be obtained by examining the relationship between symptoms of the two conditions. Some individuals with paruresis deny the presence of anxiety during attempts to urinate under scrutiny (Hammelstein et al., 2003). In their assessment of social phobia subtypes Heimberg et al. (1993) reported that anxiety regarding use of a public restroom was the “least similar” to other social anxiety symptoms and that paruresis is “not related to other aspects of social phobia” (p263). Correlational research also supports this perspective, with small, non-significant correlations between measures of paruresis and social anxiety symptoms, in both paruresis and non-generalized social phobic individuals (Hammelstein and Soifer, 2006). The finding reported above – that social anxiety symptoms are elevated in individuals with paruresis – is not evidence that paruresis is specifically related to social anxiety disorder. Individuals with high levels of paruresis symptoms are also known to show elevated levels of generalized (rather than social) anxiety symptoms, and these symptoms may be better than social anxiety symptoms at differentiating individuals with different levels of paruresis severity (Hammelstein et al., 2005).

The third general area of evidence that supports differentiation of paruresis from social anxiety comes from the differential response of the two conditions to treatments. General treatment approaches such as in vivo exposure have been demonstrated to be effective for both conditions (see below). Alternatively, there are effective treatments for social anxiety disorder such as the monoamine oxidase inhibitors (MAOIs) which have been found ineffective in paruresis in initial case

studies (Hatterer et al., 1990). The fact that paruresis responds to the same general exposure procedures as the other anxiety disorders is not surprising, and attests to its classification as an anxiety disorder, rather than social anxiety disorder specifically. The response to anti-depressant medication, however, requires more investigation in an effort to ascertain more fully differences between social anxiety and paruresis in treatment responses. A set of draft diagnostic criteria, based on the current definition of paruresis is presented in Table 1.

It is recognised that the current research evidence is limited in its ability to firmly assert the independence of paruresis versus its conceptualization as a subtype of social anxiety disorder. Further research may help refine the understanding of the relationship between these two similar conditions.

Previous Treatment Research

There exists only a small body of research into the efficacy of different treatments for paruresis. The most consistent evidence for efficacious treatment approaches exists for behavioural interventions, particularly in vivo exposure procedures. There are numerous case studies which report the use of in vivo exposure procedures (e.g. Anderson, 1977; Ascher, 1979; McCracken and Larkin, 1991; Watson and Freeland, 2001; Rogers, 2003; Zgourides et al., 1990). Such treatments usually involve the planning of a hierarchy of increasingly difficult situations in which the person is required to urinate. Reports on the use of in vivo exposure interventions are positive, with gains maintained at up to two years post-treatment (Nicolau et al., 1991)

One single case study reports on the use of biofeedback in treatment of paruresis. Christmas et al. (1991) reported on the case of a 19 year old male with

paruresis, who was treated using an audio-biofeedback device designed to provide information to the patient concerning the tension of his pelvic floor musculature. When provided with this biofeedback (and verbal encouragement), the patient was able to initiate and sustain urination in the clinic. While the authors present no data concerning the generalization of this effect to outside the clinic, they report their results as initial tentative support for the use of biofeedback in voiding dysfunction.

Of note is the paucity of reports on cognitive interventions for paruresis, a fact that has been highlighted by previous authors (e.g. Zgourides, 1987). Jaspers (1998) report on a combined cognitive and behavioural intervention for paruresis, which incorporated in vivo exposure procedures with cognitive restructuring used in the treatment of other anxiety disorders. The author reported that her patient was free of clinically significant paruresis symptoms at cessation of treatment, and at six-month follow-up. The author interprets her findings as supportive of the use of cognitive methods in the treatment of paruresis, although such a conclusion is difficult to draw when the independent treatment effects of cognitive restructuring and in vivo exposure can not be discriminated, as in their case study.

Pharmacological intervention has generally proven “mostly disappointing” in the treatment of paruresis (Bohn and Sternbech, 1997, p41). Adrenergic beta-blockers have shown little or no effectiveness (e.g. Zgourides, 1987), and the small number of cases in which monoamine oxidase inhibitors have been tried have also shown no significant treatment response (Hatterer et al., 1990). Recently, successful treatment of a single case with gabapentin was reported, raising the possibility that further research into psychopharmacological interventions may yield effective interventions (Kaufman, 2005). Furthermore, there are no trials of modern serotonin-specific agents in the treatment of paruresis (Kaufman, 2005). The limited amount of research

into pharmacotherapeutic interventions from different classes make it difficult to draw firm conclusions, with further research needed to clarify the efficacy of these treatments.

An alternative approach to the use of pharmacological agents in the treatment of paruresis is their use as adjuncts to behavioural interventions. One problem highlighted with in vivo exposure-based interventions has been the inability of the participant to engage in multiple exposure trials within a single treatment session, due to insufficient urine production (Bohn and Sternbach, 1997). Although this can be partially addressed through increased fluid intake prior to treatment sessions, pharmacological agents have also been utilised. Carbachol and bethanechol chloride, parasympathetic stimulants, have both been used to increase or facilitate urination during exposure procedures (Ascher, 1979; Zgourides, 1988). Furosemide, a diuretic has been suggested as an adjunct to assist in urine production (Thyer and Curtis, 1984), while beta-blockers such as atenolol (Hatterer et al., 1990; Zgourides, 1991) and propranolol (Zgourides and Warren, 1990) have also been used to assist with relaxation of the urethral sphincter during exposure, although with limited effect. The published treatment studies in the area of psychopharmacological adjuncts are limited, consisting only of case-studies, making definitive recommendations difficult to draw without further research.

Despite the apparent differences in treatment efficacy, individuals with paruresis obtain behavioural treatment no more often than they are offered pharmacological agents or psychodynamic approaches. Approximately 43% of individuals with paruresis report trying either medication or behavioural intervention, while around 44% report receiving other forms of psychotherapy (Vythilingum et al.,

2002). These statistics should, however, be regarded as preliminary as they are drawn from a sample of self-selected emetophobia participants.

A Model of Paruresis

Early Behavioural Model of Paruresis

Early behavioural models of paruresis focused on the effect of emotional arousal on conscious control of the relevant physiology, and the conditioning processes thought to elicit and maintain social inhibition of micturition. The ability to initiate and sustain urination is known to be sensitive to emotional arousal (Middlemist et al., 1976). Anxious arousal has been demonstrated to effect detrusor muscle tone (Straub et al., 1949) as well as the ability to relax the external urethral sphincter. Fear and embarrassment have specifically been associated with inhibition of the ability to relax the external sphincter to allow for the passage of urine (Scott et al., 1964; see Table 2, Element #1).

There is evidence for strong conditioned inhibition of urination in social situations, developing from childhood toilet-training. Close interpersonal contact has been shown experimentally to increase urinary latency, and reduce the duration of micturition in men at public urinals (Middlemist et al., 1975). In individuals with paruresis, the association between social cues such as the presence of others and the inhibition of urination may be particularly strong and/or broadly generalized (Table 2, Element #3). In addition, the stimuli usually associated with initiation of urination may be particularly narrow (Table 2, Element #2). For example, only the cues in the individual's home lavatory environment may elicit the urination reflex, making initiation when these cues are absent particularly difficult. Repeated anxious attempts

at urination may also lead to a learned association between public urination and anxious arousal, making future attempts more likely to also elicit anxiety.

Repeated attempts at urination, with the associated anxious arousal may lead to the development of significant avoidance behaviour. Attempts at urination are accompanied by aversive consequences such as anxiety, embarrassment and shame. Furthermore, the decision to leave the aversive situation is followed by a reduction in aversive stimuli (Table 2, Elements #4 and #5). This pattern of positive punishment and negative reinforcement is identical to that seen in avoidance behaviour observed in other anxiety conditions such as agoraphobia (e.g. Rachman, 1991).

In addition to avoidance behaviour, other safety-behaviours may be employed by the individual with paruresis (Table 2, Element #6). Behaviours such as reducing fluid intake, and restriction of the types of foods/beverages consumed may be used. Other safety behaviours such as toileting at certain times (e.g. before leaving the house) may also be used.

A Revised Cognitive Behavioural Model

Earlier behavioural models of psychopathology neglect the significant developments in cognitive science, cognitive psychology, and cognitive psychotherapy over the last 40 years. Cognitive phenomena are known to play important roles in fear acquisition and maintenance (e.g. Clum and Knowles, 1991), a fact that has been acknowledged by their incorporation into earlier behavioural models of anxiety disorders such as panic disorder (Clark, 1986), agoraphobia (Clum and Knowles, 1991), obsessive compulsive disorder (Salkovskis, 1985, 1999), post-traumatic stress disorder (Brewin and Holmes, 2003), social anxiety disorder (Rapee and Heimberg, 1997; Clark and McManus, 2002), emetophobia (Boschen, 2007) and

specific phobias (Rachman, 1991). Despite an earlier call for incorporation of cognitive factors into a model of paruresis (Jaspers, 1998), there is no published comprehensive attempt to do so. The revised cognitive-behavioural model of paruresis presented below attempts to update the earlier behavioural model reviewed above, incorporating cognitive phenomena observed in other anxiety conditions. It should be noted, however, that the suggestions below arise out of research into other anxiety conditions, rather than from their direct observation in paruresis. The components in the revised formulation outlined below require further empirical investigation to increase certainty over their role in paruresis.

Clues for aetiology of paruresis can be gleaned from several sources, including those writing about other similar anxiety conditions. A number of factors hypothesised to be important in genesis of paruresis were investigated by Malouff and Lanyon (1985) who compared a group of paruretic individuals with a control sample. In this study, a history of performance anxiety or interpersonal anxiety was significantly different between the two groups. Sexual anxiety, sexual dysfunction, sexual experience, introversion, family size and childhood area population density were not related to the diagnosis of paruresis, despite these having been highlighted as important in previous case reports (e.g. Lamontagne and Marks, 1973; Anderson, 1977; Ray and Murphy, 1975).

It is difficult to ascertain whether familial factors play a significant role in vulnerability to developing paruresis. There are no well-designed studies which specifically assess the genetic contribution, but there is some preliminary evidence from self-report that prevalence of paruresis is higher in those with family history of the disorder (Vythilingum et al., 2002). The authors did not, however, differentiate between inter-generational transmission through genetic and other mechanisms.

Authors writing on other anxiety conditions such as social anxiety disorder have highlighted the fact that it is difficult to pinpoint the specific origins of cognitive structures and biases (e.g. Rapee and Spence, 2004). Early events may be important in the origin of cognitive content and processes in paruresis. Events such as teasing and bullying are thought to be important in the origin of other performance-related anxiety disorders such as social phobia (Rapee and Spence, 2004). Furthermore, there is emerging evidence for the role of over-controlling parenting style in the genesis of social phobia (e.g. Hudson and Rapee, 2001). It is possible that similar learning experiences may contribute to the development of paruresis symptoms where teasing and parental control are directed at voiding behaviour.

The maintenance of paruresis may be attributable to different mechanisms than those related to origin of the disorder. The probability and severity of negative evaluation may be overestimated by individuals with paruresis (Table 2, Element #7), as in other anxiety disorders (Foa et al., 1996). In addition, the meaning attached to such negative evaluation may serve to inflate its apparent severity. Individuals with paruresis may possess a general expectancy that others are likely to be critically evaluative (Table 2, Element #8).

Through ongoing avoidance, and the use of safety behaviours (Table 2, Element #6), individual with paruresis may deny themselves the opportunity to accumulate evidence that contradicts their existing beliefs (Table 2, Element #9). Individuals who choose to always use quiet facilities deny themselves the opportunity to attempt exposure and new learning in different environments. People who engage in safety behaviours never allow themselves to discover the outcome where safety behaviours are relinquished.

Similarly to social anxiety disorder, individuals with paruresis may have a tendency to interpret ambiguous cues as indicators of negative evaluation (Stopa and Clark, 2000; Table 2, Element #10). Ambiguous stimuli such as silence from another person waiting to use the facility may be interpreted as their listening to the anxious paruretic. Any innocuous comment made by a person using the same urinal may be interpreted as scornful.

Unrealistic beliefs about normal urination behaviour may also serve to maintain paruresis symptoms (Table 2, Element #11). Many people may be unaware of the normalcy of urinary hesitancy in situations of scrutiny, as demonstrated by Middlemist et al. (1976). Where individuals possess unrealistic beliefs about how rapidly they should be able to commence micturition (or how this should be unimpeded when others are present) and their behaviour fails to match these operating rules, anxiety is likely to increase.

Exaggerated concerns about visual/auditory privacy are present in individuals with paruresis (Turk et al., 1998; Table 2, Element #12). The perceived need to ensure complete privacy before urinating sets an individual up for difficulty in urinating in any shared or public lavatory facility.

Individuals with concerns about use of public toilet facilities may possess inflated concerns about, or distortions of, body image (Table 2, Element #13). Males at urinals are in a situation where a usually-private body part is made somewhat visible to others. When individuals perceive their anatomy as comparatively inadequate, anxiety is an understandable consequence. At its most extreme, some individuals may have near-dysmorphic ideas about the inadequate appearance of their body parts.

One maintaining factor that is specific to paruresis is the *micturition double-bind* (Table 2, Element #14). This double-bind occurs when an individual attempts urination in a performance situation. Succinctly put, this bind means that when individuals are attempting to urinate under conditions of potential audience they are placed in a situation when either outcome is likely to attract further attention to their behaviour. If they fail to urinate, then this will be noticed by others; if they do successfully commence voiding, this creates auditory, visual and olfactory stimuli that may be noticed by others. Either outcome is perceived to result in increased scrutiny. This concern about scrutiny of bodily symptoms that are not under complete conscious control is similar to that seen in other conditions such as blushing, excessive perspiration, and emetophobia (Marks and Gelder, 1966; Scholing and Emmelkamp, 1993; Boschen, 2007).

Through previous failed attempts to use public toilet facilities, individuals with paruresis are likely to develop beliefs about their inability to use such facilities in future. These *micturition self-efficacy* beliefs are also likely to lead to significant anticipatory anxiety as a paruresis sufferer prepares to attempt use of public facilities (Table 2, Element #15). Such beliefs also setup the self-fulfilling prophecy that the individual will be too anxious to initiate or sustain micturition (Scholing and Emmelkamp, 1999). These become self-confirming when the anxiety they elicit prevents effective micturition. Such outcome expectancies have been demonstrated to be important in other conditions such as agoraphobia, serving as better predictors of avoidance than behavioural mechanisms (Clum and Knowles, 1991).

When individuals with social anxiety enter into a social situation, their attention becomes increasingly focused on processing of their own appearance, behaviour and internal state (Clark and McManus, 2002). It is suggested here that a

similar process operates in paruresis (Table 2, Element #16). The consequences of this self-focused attention may include an obliviousness to the fact that others are not attending to them, as well as heightened awareness of the inability to relax the urethral sphincter and commence micturition.

During attempts at urination in social contexts, individuals with paruresis may show the same attentional bias to stimuli that indicate negative evaluation or scrutiny as is seen in social phobia (Table 2, Element #17). Such attentional bias to threat stimuli (Amir et al., 2003; Mogg et al., 2004) and critical evaluation (Veljaca and Rapee, 1998; Perowne and Mansell, 2002; Clark and McManus, 2002) have been observed in other anxiety disorders such as social phobia. A hypersensitivity to these (real and perceived) judgements increases the chance that such judgements will be attended to and encoded into memory for later retrieval (see Element #18 below).

Information processing models of other anxiety disorders highlight the importance of distortions in post-event information processing (e.g. Clark and Wells, 1995; Clark and McManus, 2002). It is proposed here, that these also may be evident in paruresis (Table 2, Element #18). Distortions may, for example, be evident in recall of events: Individuals may dwell on memories of unsuccessful attempts at urination under perceived scrutiny, or indications of scrutiny and judgement by others.

A visual formulation of paruresis is presented in Figure 1. This diagram may assist both the clinician and the individual with paruresis to understand the condition, and assist in the selection and justification of intervention methods.

Formulation Based Treatment of Paruresis

Treatment should be accompanied by systematic assessment of its effectiveness. Behavioural records, journals, and self-report measures such as the

Paruresis Checklist (Hammelstein et al., 2005) are examples of potentially useful methods.

Formulation-based treatments are directly suggested by the conceptualisation outlined above. Table 2 links treatment components (and their specific aims) with elements of the formulation. Established treatments such as in vivo exposure (e.g. Anderson, 1977) and arousal management skills (Zgourides, 1987) are incorporated. Cognitive restructuring is also suggested, with specific targets for cognitive work. This is consistent with suggestions for further elaboration of cognitive techniques in psychogenic disorders of micturition (Jaspers, 1998; Zgourides, 1987). Also proposed are novel additions to established procedures such as specific psychoeducation, the use of behavioural experiments, attention training, and the relinquishing of safety behaviours.

Future Research Agenda

The model of paruresis presented here draws on evidence-based psychological principles used in the understanding of other emotional disorders. Nevertheless, the model of paruresis needs to be assessed in a group of individuals with paruresis. The draft diagnostic criteria provided are intended to serve as a starting point for research into establishing valid, reliable criteria for diagnosis. There is an obvious need for a controlled treatment outcome study investigating the efficacy of cognitive behavioural (and other potential) interventions for paruresis. The accumulated collection of case reports provides initial support for the effectiveness of behavioural and cognitive behavioural treatment approaches. Stronger evidence, however, would be obtained from a controlled treatment trial. Although behavioural treatments have been suggested to be effective, there is not yet enough research evidence to draw

conclusions about the additional benefit of incorporating cognitive therapy strategies into paruresis interventions. Future research may attempt ‘dismantling’ studies in which the relative contribution of cognitive and behavioural strategies can be assessed. The limited amount of research into the effectiveness of pharmacological agents could also be expanded, with comparisons between different treatments given alone, or in combination.

Conclusion

Paruresis is a distinct anxiety disorder where urination is inhibited in situations of perceived scrutiny. The condition can be best conceptualised using evidence-based cognitive and behavioural principles established for other anxiety disorders. The current conceptualisation suggests avenues for enhancing previous behavioural treatments for paruresis with cognitive methods. Despite this, there remains considerable research needed into the validity of the diagnosis, formulation, and efficacy of the treatment proposed herein.

Acknowledgements

I wish to thank Professor Murray Dyck and Judith Warner for their valuable input on earlier drafts of this paper.

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Table 1

Draft Diagnostic Criteria for Paruresis

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- A. A marked and persistent fear that one may be unable to urinate in situations where the person perceives that they may be under the potential scrutiny of others (e.g. public urinals).
 - B. Exposure to the feared situation provokes either or both of the following:
 - i. A clinically significant increase in anxiety and arousal symptoms
 - ii. Clinically significant impairment of normal urinary function, such as inability to urinate, extreme latency in urinating, or inability to sustain urination.
 - C. The person recognises that the fear (of scrutiny, embarrassment, humiliation, etc.) is excessive or unreasonable. **Note:** In children this feature may be absent.
 - D. The use of toilet facilities where one's actions (or their consequences) may be under scrutiny is avoided, or endured with intense anxiety or distress.
 - E. The avoidance or distress interferes significantly with the individual's routine, occupational/academic functioning, social activities or relationships, or there is marked distress about the condition itself.
 - F. The duration of symptoms is at least six months.
 - G. The fear, avoidance, or inability to micturate are not due to the direct physiological effect of a substance or general medical condition, and is not better accounted for by another psychological disorder (e.g. social phobia).
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Table 2

Formulation and Treatment Elements for Paruresis

Formulation Element	Treatment Component
<i>Behavioural (Classical)</i>	
1. Conditioned association of social cues such as presence of others, public urinals, etc. with anxiety and inhibition of urination	<i>In vivo exposure:</i> Aim to weaken existing associations.
2. Narrow range of stimuli associated with micturition	<i>In vivo exposure:</i> Aim to establish associations between public facilities and urination.
3. Excessive generalization of conditioned association between social context and inhibition of micturition	<i>In vivo exposure:</i> Aim to weaken existing associations.
<i>Behavioural (Operant)</i>	
4. Positive punishment of attempts at urination through unpleasant physiological symptoms (e.g. hot flushes), embarrassment, shame, etc.	<i>Arousal management:</i> Aim to reduce physiological arousal symptoms.
5. Negative reinforcement of avoidance behaviour	<i>In vivo exposure:</i> Aim to encourage approach behaviour, and not use reinforcing avoidance behaviours.
6. Use of safety behaviours	<i>Relinquishing safety behaviours:</i> Aim to encourage surrender of safety behaviours/signals.
<i>Cognitive (Content)</i>	
7. Beliefs about the meaning, probability and severity of negative evaluation	<p><i>Cognitive restructuring:</i> Aim to rationally reassess meaning, probability and severity of negative evaluation.</p> <p><i>Behavioural experiments:</i> Aim to empirically test meaning, probability and severity of negative evaluation.</p>
8. Expectancy of others as critical evaluators	<i>Cognitive restructuring:</i> Aim to reappraise beliefs about others as critical evaluators.
9. Failure to gather corrective	<i>In vivo exposure:</i> Aim to gather

information due to avoidance	information to reassess beliefs.
10. Interpretation of ambiguous cues as indicators of negative evaluation	<i>Behavioural experiments:</i> Aim to empirically gather evidence to test beliefs.
11. Unrealistic beliefs about normal duration of urinary latency	<i>Cognitive restructuring:</i> Aim to reassess meaning of ambiguous cues.
12. Exaggerated concerns about visual or auditory privacy	<i>Psychoeducation:</i> Aim to inform about natural urinary hesitancy, and prevalence of paruretic symptoms.
	<i>Cognitive restructuring:</i> Aim to reassess need for high levels of privacy.
	<i>In vivo exposure:</i> Aim to relinquish need for privacy.
13. Body image distortions and concerns	<i>Psychoeducation:</i> Aim to inform about natural variability in anatomy.
	<i>Cognitive restructuring:</i> Aim to rationally reassess beliefs about body appearance.
14. Micturition double-bind	<i>Cognitive restructuring:</i> Aim to reassess consequences of urinary hesitancy, or urinary stimuli.
15. Low micturition self-efficacy and associated anticipatory anxiety.	<i>In vivo exposure:</i> Aim to improve self-efficacy through successful exposure tasks, also reducing anticipatory anxiety.
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<i>Cognitive (Process)</i>	
16. Allocation of attentional resources to self-monitoring	<i>Attention training:</i> Aim to assist patient in redeploying attention away from the self.
17. Attentional bias to stimuli which may indicate negative evaluation	<i>Attention training:</i> Aim to address imbalance in bias to negative stimuli.
18. Post-event information processing biases.	<i>Cognitive restructuring:</i> Aim to encourage unbiased, rational reappraisal of attempts.
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Figure Captions

Figure 1. Visual formulation model of paruresis