

The Reinforcement Sensitivity Theory Personality Questionnaire (RST-PQ)

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Below is the information needed to score the Corr-Cooper RST Personality Questionnaire (RST-PQ). Also, included below is text describing important aspects of the questionnaire. Please bear in mind that there are two major levels of the questionnaire: *a priori* (theoretical) facets and empirically-derived factors, shown below. For your analysis, use the empirically-derived factors, as described below. (Towards the end of this document is some discussion of these *a priori* facets to give you some sense of how the empirical factors were developed – but for now focus on the factor analytical results.) The empirical factors were developed via exploratory factor analysis and then confirmed by confirmatory factor analysis.

The RST-PQ is shown at the end of this document. You will see several missing questions: these have been left black for the time being, but will be eliminated in the final version. Check the version of the questionnaire you have used against the scoring key.

Note. All items are positively scored, so there is no need to reverse score. For response categories, use a scale such as 1-4, or 0-3 (these will give the same correlational results).

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Behavioural Approach System Factors:

Reward Interest: Q17, Q18, Q33, Q40, Q44, Q15, Q12

Goal-Drive Persistence: Q5, Q13, Q25, Q39, Q54, Q71, Q84

Reward Reactivity: Q3, Q9, Q4, Q19, Q30, Q31, Q32, Q38, Q45, Q47

Impulsivity: Q29, Q35, Q36, Q48, Q53, Q57, Q68, Q70

Fight-Flight-Freeze System (FFFS):

Q10, Q24, Q52, Q60, Q61, Q64, Q69, Q77, Q78, Q81

Behavioural Inhibition System (BIS):

Q1, Q2, Q7, Q8, Q11, Q21, Q23, Q28, Q37, Q41, Q42, Q55, Q56, Q62, Q65, Q66, Q74, Q75, Q76, Q79, Q80, Q82, Q83

The following two factors were developed separately from the above factors.

Panic: Q16, Q22, Q46, Q58, Q73, Q 26

Defensive Fight: Q50, Q6, Q14, Q20, Q51, Q27, Q34, Q43

Background Literature

The Reinforcement Sensitivity Theory (RST) of personality is one of the most prominent biologically-inspired approaches to understanding motivation, emotion, personality, and their relevance to psychopathology. Gray's (1982) neuropsychology of anxiety, based on a behavioural inhibition system (BIS), has spawned a large literature (for a summary of this literature, see Corr, 2008). Several psychometric measures have been developed to measure RST constructs, the most widely used one being the Carver and White (1994) BIS/BAS scales. However, since the development of these personality scales, Gray's theory was substantially revised (Gray & McNaughton, 2000), and now we have a separation of revised RST constructs and personality measurement. Despite the passing of nearly ten years, we still do not have a comprehensive questionnaire measure of revised RST constructs, and most research continues to use scales that are based on the unrevised theory, which differs in some fundamental ways from the 2000 revision. The aim of this paper is to remedy this situation.

RST is built upon a description of the immediate/short-term *state* of neural systems: how animals, including the human form, respond to motivationally significant (i.e., 'reinforcing') stimuli, and which neuropsychological systems mediate these responses. Built upon this state infrastructure are longer-term *trait* dispositions of emotion, motivation and behaviour. In broad terms, RST views animals as motivated to maximize their exposure to rewarding ("appetitive") events and to minimize their exposure to punishing ("aversive") events. Rewarding or appetitive events consist of the presentation of a reward, termination of a punishment, or omission of an expected punishment (i.e., relief of nonpunishment), while punishing or aversive events consist of the punishment, termination of reward,

and omission of an expected reward (i.e., frustrative non-reward). RST is not a theory about reactions to reinforcement per se. but rather a theory of central emotion/motivational states that mediate reactions to motivationally-salient stimuli.

Revised RST continues to propose two major affective dimensions, rewarding/ positive and punishing/ negative, with the latter dimension breaking down into two systems that are responsible for mediating reactions to specific functional demands. The first defensive system is concerned with avoiding/ escaping punishment, and is identified with fear; whereas the second system is responsible for resolving the conflict in general, including that of approach behaviour in high perceived threat environment (e.g., foraging in the area where there are signs, e.g., smell, of predators), and is associated with anxiety.

The Defense System

Revised RST proposes three major systems of emotion and motivation, two concerned with aversive events, and one concerned with appetitive events (for a comprehensive summary of RST, see Corr, 2008).

Fight-Flight-Freeze System (FFFS)

The FFFS updates the *Fight-Flight System* (FFS) of original RST to include 'freezing'. It is responsible for mediating reactions to *all* aversive stimuli, conditioned and unconditioned (in contrast, the original, 1982, theory assigned the FFS to reactions to *unconditioned* aversive (pain) stimuli). It proposes a hierarchical array of neural modules comprises, each responsible for a specific defensive behaviour (e.g., avoidance and escape). Importantly, the FFFS mediates the "get me out of this place" emotion of fear, not anxiety (which is concerned with *approaching* danger; see below). The FFFS is an example of a negative feedback system, designed to reduce the discrepancy between the immediate threat and the desired state (i.e., safety). The

associated personality factor comprises fear-proneness and avoidance, which clinically maps onto such disorders as phobia and panic.

Behavioural Inhibition System (BIS)

Revised RST contends that the BIS is responsible, not for mediating reactions to conditioned aversive stimuli and the special class of innate fear stimuli (as in the unrevised RST theory; Gray, 1982), but for the resolution of goal conflict in general (e.g., between BAS-approach and FFFS-avoidance, as in foraging situations – but it is also involved in other forms of conflict, both within and between motivational systems). It is a negative feedback system aimed at countering the deviation from the reference state of no goal conflict. The BIS generates the “watch out for danger” emotion of anxiety, which entails the inhibition of prepotent conflicting behaviors, the engagement of risk assessment processes, and the scanning of memory and the environment to help resolve concurrent goal conflict. In typical animal learning situations, BIS outputs have evolved to permit an animal to enter a dangerous situation (i.e., leading to cautious ‘risk assessment’ behaviour) or to withhold entrance (i.e., passive avoidance).

The BIS resolves conflicts by increasing, by recursive loops, the negative valence of stimuli (these are adequate inputs into the FFFS), until behavioural resolution occurs in favour of approach or avoidance. Subjectively, this state is experienced as worry, apprehension and rumination. The associated personality comprises worry-proneness and anxious rumination, leading to being constantly on the look-out for possible signs of danger, which clinically maps onto such conditions as generalized anxiety and obsessional-compulsive disorder (OCD) – both conditions reflect a lack of adequate goal conflict resolution appropriate to local environmental parameters. There is an optimal level of BIS activation: too little leads to risk

proneness (e.g., psychopathy) and too much to risk aversion (generalised anxiety), both with sub-optimal conflict resolution.

It is possible to discern separate components of BIS functioning – this analysis holds important implications for measuring these functions. The first function of the BIS is to interrupt ongoing behaviour (inhibiting ongoing appetitively and aversively-motivated behaviours); then cautious approach and risk assessment behaviour is initiated in order to gather information on the threat posed by the environment (e.g., in the rodent example, the scent of a cat and its potential presence in the foraging area) – this is ‘passive avoidance’, which does not entail behavioural passivity (and needs to be differentiated from freezing), but rather cautious approach (or, in some situations, the withholding of entry into the perceived threat environment).

Other relatively distinct process associated with the BIS, specifically when applied to human beings, are: (a) worry and rumination about possible danger; (b) obsessional thoughts about the possibility of something unpleasant going to happen; and (c) behavioural disengagement, when the threat has to be approached and it cannot be unavoidable.

Distributed Neural Systems

One major alteration in revised RST is the inclusion of a hierarchical arrangement of *distributed* brain systems that mediate specific defensive behaviours associated with level of threat experienced, ranging from the prefrontal cortex, at the highest level, to the periaqueductal grey, at the lowest level. To each structure is assigned a specific class of mental disorder (McNaughton & Corr, 2004, 2008). According to this perspective, separate emotions (e.g., fear, panic, etc.) are seen as reflecting the evolution of specific neural modules to deal with specific environmental demands (e.g., flee in the face of a predator) and, as these separate

systems evolved and started to work together, some form of regulatory process (e.g., when one module is active, others are inactivated) evolved. The resulting hierarchical nature of this defence system reflects the fact that simpler systems must have evolved before more complex ones, which provides a solution to the problem of conflicting action systems: the later systems evolved to have inhibitory control on lower-level systems. The result of this process of evolution is the existence of hierarchically ordered series of defensive reactions, each appropriate for a given defensive distance (i.e., level of threat perceived; see below).

This hierarchical arrangement may seem at first to be complex; however, it can be conveniently summarised in terms of a two-dimensional scheme, consisting of 'defensive distance' and 'defensive direction' (McNaughton & Corr, 2004; see McNaughton & Corr, 2008, Figure 2.3). The two-dimensional neural theory translates to a two-dimensional psychological schema, reflecting two broad negative affective dimensions.

Defensive Direction: Fear vs. Anxiety

The avoidance of, or approach to, a dangerous stimulus is reflected in the categorical dimension of 'defensive direction', which further reflects a functional distinction between behaviours (a) that remove an animal from a source of danger (FFFS-mediated, fear), and (b) that allow it cautiously to approach a source of potential danger (BIS-mediated, anxiety). These functions are ethologically and pharmacologically distinct and, on each of these separate grounds, can be identified with fear and anxiety, respectively (see McNaughton & Corr, 2004, 2008).

Defensive Distance: Fear and Anxiety

The type of behavioural reaction to a threat is reflected in the second dimension of 'defensive distance', which reflects further the actual, or perceived,

distance from threat. This dimension applies equally to fear and anxiety but operates differently in each case: anxiolytic drugs change it in the case of the BIS-anxiety, but not in the case of FFFS-fear. The main point is that defensive distance (i.e., how far you think you are from the threat, which closes with increasing magnitude of threat) corresponds to activation of specific neural modules (e.g., at very close defensive distance, PAG activation and rage/panic).

Although we can equate defensive distance with real distance, it is more accurately seen as a *perception* – that is an internal quantity that defines defensive reactions to a fixed unit of threat (i.e., magnitude x distance). It is this perceived level of threat that defines ‘punishment sensitivity’, or more broadly neuroticism. RST contends that this sensitivity reflects the summation of action of the FFFS and BIS. Therefore, a more defensive person will *perceive* a threat of a fixed objective value as being more threatening (i.e., closer) than a less defensive person. Indeed, this hypothesis helps to explain the actions of drugs: they do not affect the *intensity* of a particular behaviour (e.g., avoidance), rather they affect ‘perceived distance’ (i.e., the magnitude of perceived threat), and thus they lead to *different* behaviours being shown (e.g., from avoidance to cautious approach) (McNaughton & Corr, 2004, 2008).

Behavioural Approach System (BAS)

Revised RST contends that the BAS mediates reactions to *all* appetitive stimuli, conditioned and unconditioned – although the latter also requires specific consummatory systems. The BAS generates the appetitively hopeful emotion of ‘anticipatory pleasure’. The associated personality comprises optimism, reward-orientation and impulsiveness, which clinically maps onto addictive behaviors (e.g., pathological gambling) and various varieties of high-risk, impulsive behavior, and possibly the appetitive component of mania. (The BAS is largely unchanged in the

revised version of RST.) This is a positive feedback system, designed to move away from current appetitive goal-state towards the biological reinforcer. The BAS is the “Let’s go for it!” system.

The BAS Reconceptualised

The *primary* function of the BAS is to move the animal up the temporo-spatial gradient towards the final biological reinforcer -- for this reason, behavioural ‘approach’ is to be preferred to ‘activation’. As discussed by Corr (2008), this primary function is supported by a number of *secondary* processes. In its simplest form, the secondary process could comprise simple approach, perhaps with BIS activation exerting behavioural caution at critical points, designed to reduce the distance between current and desired appetitive state (e.g., as seen in foraging behaviour in a densely vegetated field); but in the case of human behaviour, this depiction of BAS-controlled approach behaviour is grossly oversimplified and requires more careful delineation and definition. Although the majority of personality scales designed to measure the BAS are unidimensional, there is evidence that it is multidimensional (Carver & White, 1994).

It is possible to identify a number of relatively separate, albeit overlapping, BAS processes. At the simplest level, there seems an obvious difference between the ‘reward interest’ and ‘drive-persistence’, that characterises the early stages of approach, and the behavioural and emotional excitement as the animal reaches the final biological reinforcer (‘reward responsivity’ and ‘impulsivity’). Emotion in the former case may be termed ‘anticipatory pleasure’ (or ‘hope’); in the latter case something akin to an ‘excitement attack’ of high pleasure/joy.

There is evidence at the psychometric level that the BAS behaviour/emotion is multidimensional. For example, the Carver and White (1994) BIS/BAS scales

measure three aspects of BAS: *Reward Responsiveness*, *Drive* and *Fun-Seeking*. As noted by Carver (2005, p. 9; Square brackets added),

‘The three aspects of BAS sensitivity that are reflected in the three BAS scales derive from theoretical statements about the ways in which BAS functioning should be reflected experientially. That is, high BAS sensitivity should cause people to seek new incentives [Reward Responsiveness], to be persistent in pursuing incentives [Drive], and to respond with positive feelings when incentives are attained [Fun Seeking].’

We believe that Carver and White were correct in arguing for a multidimensional structure; however, for reasons given below, we also believe that their structure needs elaboration and revision.

In the conceptualisation proposed by Corr (2008) and elaborated here, *Reward Interest* relates to the initial motivation to see out potentially rewarding places, activities and people – it may be likened to an appetitive radar that scans the environment for opportunities. *Drive-Persistence* is concerned with actively pursuing desired goals, especially when immediate reward may not be available, and there is only the potential for reward (this factor is similar to Carver and White’s *Drive* scale) *Reward-Reactivity* is concerned with excitement at doing things well and winning, especially to rewarding stimuli associated with fulfilling sub-goal procedures (see below). Often this factor is seen the core of the BAS; although we consider it of fundamental importance it is not the only BAS process (it is very similar to Carver and White *Reward Responsiveness*). Finally, *Impulsivity* relates more to behaviours closer to the final biological reinforcer, which no longer entails planning and

restraint of behaviour – it is conceptually similar to the Carver and White *Fun-Seeking* scale. Further delineation of BAS factors is given below.

Sub-Goal Scaffolding

In order to move along the temporo-spatial gradient to the final primary biological reinforcer, Corr (2008) argued that it is necessary (certainly in human beings) to engage in *sub-goal scaffolding*. This process consists of (a) identifying the biological reinforcer, (b) planning behaviour, and (c) executing the plan (i.e., ‘problem solving’) at each stage of the temporo-spatial gradient – this is in accordance with the type of cognitive operations first discussed by Miller, Galanter and Pribram (1960).

Complex approach behaviour entails a series of behavioural processes, some of which oppose each other. For example, behaviour *restraint* and *planning* are often demanded to achieve BAS goals, but not at the final point of *capture* of the biological reinforcer, where non-planning and fast reactions (i.e., impulsivity) are more appropriate. Just being impulsive – that is, acting fast without thinking and not planning -- would be counter-productive to successful approach behaviour as it would move the animal along the temporo-spatial gradient *away* from the final biological reinforcer. As noted by Carver (2005, p. 312), ‘...unfettered impulse can interfere with the attainment of longer term goals.’

Sub-goal scaffolding, which is necessary for planning effective BAS approach to appetitive stimuli, will often entail the *inhibition* of impulsive behaviour, and for this reason we may suspect that BAS behaviours are hierarchically organised, such that lower-level reactions (e.g., impulsiveness) are inhibited by high-level (control) modules, which involve the cognitive processing underlying sub-goal scaffolding. In parallel with the example of FFFS-mediated panic attack, having an impulsivity-related behaviour when the biological reinforcer (i.e., unconditioned stimulus) is not

proximal would be inappropriate. A panic attack is appropriate when suffocating; rash impulsivity is appropriate when cognitive planning can be replaced, at short temporo-spatial distance, by fast 'getting', or a physical grabbing, action (Carver, 2005). Therefore, there is a need to take due consideration of two processes in BAS-controlled approach: (a) *behavioural restraint* is needed to plan and execute effective sub-goal scaffolding; and (b) *impulsive behaviour* is needed to get/capture the final biological reinforcer at near-zero temporo-spatial distance.

This theoretical position does not imply that the emotional component of BAS behaviour would be attenuated at the early stages of approach behaviour; in fact, as noted above, the fulfilment of sub-goals is likely to entail periodic bursts of emotional excitement to maintain motivation across time/space where positive reinforcement is not immediately available. This process has been labelled 'temporal bridging' (Corr, 2008) to emphasize the need to maintain approach behaviour across time gaps during which approach behaviour is not being immediately reinforced: *Drive-Persistence* is especially important in this respect.

Existing RST-Relevant Questionnaire Measures

Existing RST questionnaire measures were developed on the basis of the pre-2000 theory. For example, in addition to the three sub-scales of the Carver and White (1994) BAS scale, it provides an apparently unitary measure of BIS. Importantly, however, fear and anxiety are not differentiated. To some extent, within the BIS scale it is possible to separate fear from anxiety (Corr & McNaughton 2008) – although for some items this differentiation is blurred.

Poythress (2008) reported that, in an offender sample, the BIS scale does, indeed, break down into two sub-scales, as indicated above (see also, Johnson, Turner and Iwata, 2004), suggesting that closer attention should be paid to differentiating fear and anxiety even in existing questionnaire. However, if we are

interested in measuring non-specific punishment sensitivity then a conflation of FFFS-fear and BIS-anxiety may work quite well, and this possibility may account for the popularity of the BIS scale of the Carver and White scales.

There remains much work needed to develop revised RST scales that display theoretical fidelity and psychometrical rigour. That the differentiation of fear and anxiety is needed in terms of personality scales is shown by recent studies. Structural equation modelling has confirmed the fear-anxiety differentiation hypothesis (Cooper, Perkins and Corr 2007), as have predictive validity studies (Perkins, Kemp and Corr 2007).

Personality and Psychopathology

The two constructs of 'defensive direction' and 'defensive distance', and their mapping onto the series of neural modules that comprise the FFFS and BIS, which in turn, are attributed a particular functions, can be related to common symptomatology (see Corr & McNaughton, 2008, Figure 2.3).

The distinction between fear and anxiety has been identified in a quantitative genetics study of ten major psychiatric disorders, in a sample of 5,600 twins (Kendler, Prescott, Myers and Neale 2003). Results revealed: (a) two major dimensions emerged, one relating to *internalising* disorders (i.e., major depression, generalised anxiety disorder, and phobia), the other to *externalising* disorders (i.e., alcohol dependence, drug abuse/dependence, adult antisocial behaviour and conduct disorder); and (b) the structure of genetic risk for internalising disorders broke down into a 'anxious-misery' factor (i.e., depression, generalised disorder and panic) and a specific 'fear' factor (i.e., animal and situational phobia).

Earlier, Prescott and Kendler (1998) noted that mild depression and generalised anxiety do not appear to have distinct genetic aetiologies, but rather a common genetic basis, perhaps a disposition to dysphoric mood which is shaped by

individual experiences into symptoms of depression, anxiety, or both. (See also, Kendler, Neale, Kessler, Heath and Eaves (1992.) As Kendler et al. (2003, p. 935) speculated,

“It is tempting to speculate that these genetic factors on risk might be mediated through personality.”

In support Kendler et al. (2003), Krueger (1999) reported a confirmatory factor analysis (N = 8,098) of patterns of comorbidity among ten common mental disorders, finding that a three-model model best fitted the data: (a) externalizing disorders, (b) internalising disorders (fear) and (c) internalizing disorders (anxious-misery) – unlike the Kendler et al (2003) study, panic went with the ‘fear’ factor, which is more consistent with revised RST. As Krueger (2003, p. 921) noted, “The substantial correlation between anxious-misery and fear (0.73) suggested that these two factors were most appropriately conceived as subfactors of a higher-order internalizing factor.”

Theoretical Model of the FFFS, BAS and BIS

Our proposed theoretical model of RST is based upon a conceptual delineation of the processes thought to underlie these systems. Starting with the overall defense system, we can see two major factors, representing FFFS/fear and BIS/anxiety. We propose that these two factors to be oblique. First, revised RST argues that these systems: BIS activation causes the FFFS to increase the negative valence of goals that are in conflict. Secondly, anxiety (BIS activity) can be so intense as to provide an adequate input to the FFFS via a fear-related response – indeed, at high levels of BIS activation (near zero defensive distance, FFFS-fear replaces BIS-anxiety). Thirdly, activation of the FFFS can lead to BIS activation (e.g., activation of

avoidance and flight tendencies of comparable intensity). Lastly, although the FFFS and BIS are conceptualised and neurally distinct, and can be shown to exert opposing motivational tendencies (e.g., flee from danger vs. approaching it), there is considerable co-activation of: (a) levels of each neural hierarchy (whole system activation) and (b) across the two neural hierarchies (as they share resources to solve punishment-related problems). At the questionnaire level, it would be unrealistic to assume that FFFS-fear and BIS-anxiety processes are uncorrelated; however, on the basis of other evidence they can be conceptually separated (Perkins, Kemp and Corr, 2007). Given this phenotypic covariance, we assume that, at a second-order level, they fear collapse to a single negative affectivity factor, formerly called 'punishment sensitivity'. However, an important point is that, at the facet level, specific patterns of activation would be expected, reflecting the activation of particular neural modules. For this reason, facets may be better psychometric markers for clinical dysfunctions. However, the entire rationale of the form of development of the RST-PQ means that, in lieu of empirical evidence, the jury remains undecided on this specificity of predictive validity.

FFFS Constructs

Gray and McNaughton (2000; McNaughton & Corr, 2004, 2008) divide punishment stimuli into those that can be avoided (FFFS-related) and those that must be faced (i.e., approached; BIS-related). When there is no motivation to approach a danger (hence, the BIS is not engaged), stimuli that can simply be avoided elicit the following defensive behaviours, according to defensive distance (or perceived threat), high-to-low threat: *Flight and Avoidance*; and for stimuli that cannot be avoided (i.e., the environment does not allow for this response option), *Freezing*. The relationship between defensive distance and defensive response as a function of avoidable/unavoidable dangers is shown in McNaughton & Corr, 2008). At a

conceptual level, *Flight* and *Avoidance* map onto human phobia; *Rage/Panic* and *Freeze* map onto human panic disorder. These prototypical animal responses have been modelled in human beings with some success (Blanchard, Hynd, Minke, Minemoto, & Blanchard, 2001; Perkins and Corr, 2007).

The issue of where *Fight* and *Panic* fit into this scheme has been problematic for us as well as previous researchers, and for this reason they have been developed as separate scales.

BIS Constructs

In a similar way to the FFFS, Gray and McNaughton (2000) differentiate defensive approach behaviours that can be either avoided or not avoided. They define *anxiety* as related to approach behaviours to avoidable dangerous stimuli, leading to risk assessment and behavioural inhibition. Unavoidable defensive approach behaviours they assign to *depression* (consisting of behavioural suppression) and *obsession* (recurring thoughts of danger without a known source). We have defined these constructs more clearly here.

Defensive approach to avoidable dangerous stimuli we assign to *motor interruption*, *behavioural caution/risk assessment*, and *worry*. When approach-avoidance conflict is detected by the BIS, ongoing motor programs (both FFFS and BAS) are inhibited (i.e., *motor interruption*); this is followed by behavioural caution, entailing an inhibition of (BAS-mediated) approach behaviour and a process of risk assessment of the environment (including the scanning of memory), which we modelled as *behavioural caution/risk assessment*. *Worry* is the ruminative process, which is more cognitive in nature than *behavioural caution/risk assessment*, entailing more abstract thinking about danger – importantly, worry can go off-line, and occurs when the animal is no longer in the temporal-spatial proximity of the danger (for a discussion of worry in terms of mental modelling and consciousness, see Corr, 2009).

Turning to defensive approach behaviours that cannot be avoided, we included two factors: (a) *obsessional thoughts* and (b) *disengagement*. Obsessional thoughts concern *cognitive/emotional* engagement with a danger that cannot be identified and/or located (e.g., contaminated objects, disease, etc). *Disengagement* refers to *behavioural withdrawal* from situations where identifiable danger cannot be avoided (e.g., a depressed state following death of a love one – in this case, the thought of the dead person cannot be avoided and the fact of their death is undeniable and unavoidable).

BAS Constructs

Consistent with our conceptualisation of the BAS (Corr, 2008), we conceived five related but conceptually distinct facets: (a) *Reward Interest*, (b) *Goal Planning*, (c) *Drive-Persistence*, (d) *Reward Reactivity*, and (e) *Impulsivity*.

These factors were designed to tap the following processes.

Reward Interest

This factor taps openness to new experiences and opportunities that are potentially rewarding. People high on this facet are more likely engage in anticipatory approach, exploration of new objects, places and people, and is comparable to an animal exploring different territories, sniffing and sensing, looking for opportunities to expose themselves to rewarding experiences. It may be distinguished from *Reward Reactivity* in that it does not depend upon the presence of actual reward. It is a form of anticipatory reward expectation.

Goal-Drive Persistence

Central to our reconceptualisation of the BAS is that successful BAS behaviour includes an element of behavioural restraint and goal planning. This proposition runs the risk of verging on the obvious; however, it has not been obvious enough to be included in any of the existing BAS measures developed. Goal-

planning measures the motivation to put in place goals and sub-goals to achieve ultimate aim of obtaining reward. To achieve BAS goals it is necessary to maintain motivation and be persistent, especially when reward is not immediately available (the persistence element is comparable to Cloninger's, 1986, *Persistence* factor of the maintenance of positive motivation). The achievement of sub-goals is positively reinforcing, and helps to establish the 'temporal bridging' necessary to continue with behaviours that are aimed at a larger appetitive goal (Corr, 2008). Drive-Persistence entails a process between initial *Reward Interest* and *Goal Planning* to the final stages of reward capture/consummation (i.e., *Impulsivity*). *Reward Reactivity* provides the emotional fuel to these processes.

Note. Above two facets were combined in the final analysis.

Reward Reactivity

Often seen as the only aspect of the BAS, this essential facet relates to the generation and experience of reward (i.e., 'pleasure'), which provides the positive reinforcement for BAS behaviour. In human beings, reward reactivity is often anticipatory ('hope'), although it also relates to the emotional 'high' experienced with unconditional reward as well as with the achievement of local goals that signal that the temporo-spatial distance to the final biological goal is reducing – these local 'highs' may be important in temporal bridging from initial to final BAS processes (Corr, 2008).

Impulsivity

Impulsivity is often inimical to the goal-planning and behavioural restraint that characterises the early stages of successful BAS behaviour; however, it comes into its own at the later stages when continued planning and behavioural caution are no appropriate, replaced by the need for rapid action sufficient to 'capture' the final biological reinforcer (this can be seen in the lion jumping on its prey after stealthful

approach, or human drinking, eating or copulation after preparatory planning and approach) - at this point, the BAS interfaces with dedicated consummatory systems.

RST-PQ

Age:

Gender:

Instructions

Below are a list of statements about everyday feelings and behaviours. Please rate how accurately each statement describes *you in general*. Circle only one response. Do not spend too much time thinking about the questions and please answer honestly. Your answers will remain confidential.

	How accurately does each statement describe <i>you</i> ?	Response			
		Not at all	Slightly	Moderately	Highly
1	I feel sad when I suffer even minor setbacks.	1	2	3	4
2	I am often preoccupied with unpleasant thoughts.	1	2	3	4
3	Sometimes even little things in life can give me great pleasure.	1	2	3	4
4	I am especially sensitive to reward.	1	2	3	4
5	I put in a big effort to accomplish important goals in my life.	1	2	3	4
6	I have found myself fighting back when provoked.	1	2	3	4
7	I sometimes feel 'blue' for no good reason.	1	2	3	4
8	When feeling 'down', I tend to stay away from people.	1	2	3	4
9	I often experience a surge of pleasure running through my body.	1	2	3	4
10	I would be frozen to the spot by the sight of a snake or spider.	1	2	3	4
11	I have often spent a lot of time on my own to "get away from it all".	1	2	3	4
12	I am a very active person.	1	2	3	4
13	I'm motivated to be successful in my personal life.	1	2	3	4
14	I think retaliation is often the best form of defence?	1	2	3	4
15	I am always 'on the go'.	1	2	3	4
16	My hearts starts to pump strongly when I am getting upset.	1	2	3	4
17	I regularly try new activities just to see if I enjoy them.	1	2	3	4
18	I get carried away by new projects.	1	2	3	4

	How accurately does each statement describe <i>you</i> ?	Response			
		Not at all	Slightly	Moderately	Highly
19	Good news makes me feel over-joyed.	1	2	3	4
20	I think you have to stand up to bullies in the workplace.	1	2	3	4
21	The thought of mistakes in my work worries me.	1	2	3	4
22	I have experienced the feeling of overwhelming dread.	1	2	3	4
23	When nervous, I sometimes find my thoughts are interrupted.	1	2	3	4
24	I would run quickly if fire alarms in a shopping mall started ringing.	1	2	3	4
25	I often overcome hurdles to achieve my ambitions.	1	2	3	4
26	I sometimes wake up in a state of terror.	1	2	3	4
27	If I feel threatened I will fight back.	1	2	3	4
28	I often feel depressed.	1	2	3	4
29	I think I should 'stop and think' more instead of jumping into things too quickly.	1	2	3	4
30	I often feel that I am on an emotional 'high'.	1	2	3	4
31	I love winning competitions.	1	2	3	4
32	I get a special thrill when I am praised for something I've done well.	1	2	3	4
33	I take a great deal of interest in hobbies.	1	2	3	4
34	I would not tolerate bullying behaviour towards me.	1	2	3	4
35	I sometimes cannot stop myself talking when I know I should keep my mouth closed.	1	2	3	4
36	I often do risky things without thinking of the consequences.	1	2	3	4
37	My mind is sometimes dominated by thoughts of the bad things I've done.	1	2	3	4
38	I get very excited when I get what I want.	1	2	3	4
39	I feel driven to succeed in my chosen career.	1	2	3	4
40	I'm always finding new and interesting things to do.	1	2	3	4
41	I'm always weighing-up the risk of bad things happening in my life.	1	2	3	4
42	People are often telling me not to worry.	1	2	3	4
43	I can be an aggressive person when I need to be.	1	2	3	4

	How accurately does each statement describe <i>you</i> ?	Response			
		Not at all	Slightly	Moderately	Highly
44	I am very open to new experiences in life.	1	2	3	4
45	I always celebrate when I accomplish something important.	1	2	3	4
46	I am a panicky sort of person.	1	2	3	4
47	I find myself reacting strongly to pleasurable things in life.	1	2	3	4
48	I find myself doing things on the spur of the moment.	1	2	3	4
49		1	2	3	4
50	I usually react immediately if I am criticized at work.	1	2	3	4
51	I would defend myself if I was falsely accused of something.	1	2	3	4
52	I would instantly freeze if I opened the door to find a stranger in the house.	1	2	3	4
53	I'm always buying things on impulse.	1	2	3	4
54	I am very persistent in achieving my goals.	1	2	3	4
55	When trying to make a decision, I find myself constantly chewing it over.	1	2	3	4
56	I often worry about letting down other people.	1	2	3	4
57	I would go on a holiday at the last minute.	1	2	3	4
58	I physically shake when I am very upset.	1	2	3	4
59		1	2	3	4
60	I would run fast if I knew someone was following me late at night.	1	2	3	4
61	I would leave the park if I saw a group of dogs running around barking at people.	1	2	3	4
62	I worry a lot.	1	2	3	4
63		1	2	3	4
64	I would freeze if I was on a turbulent aircraft.	1	2	3	4
65	My behaviour is easily interrupted.	1	2	3	4
66	It's difficult to get some things out of my mind.	1	2	3	4
67		1	2	3	4
68	I think the best nights out are unplanned.	1	2	3	4

	How accurately does each statement describe <i>you</i> ?	Response			
		Not at all	Slightly	Moderately	Highly
69	There are some things that I simply cannot go near.	1	2	3	4

70	If I see something I want, I act straight away.	1	2	3	4
71	I think it is necessary to make plans in order to get what you want in life.	1	2	3	4
72		1	2	3	4
73	I tend to panic a lot.	1	2	3	4
74	When nervous, I find it hard to say the right words.	1	2	3	4
75	I find myself thinking about the same thing over and over again.	1	2	3	4
76	I often wake up with many thoughts running through my mind.	1	2	3	4
77	I would not hold a snake or spider.	1	2	3	4
78	Looking down from a great height makes me freeze.	1	2	3	4
79	I often find myself 'going into my shell'.	1	2	3	4
80	My mind is dominated by recurring thoughts.	1	2	3	4
81	I am the sort of person who easily freezes-up when scared.	1	2	3	4
82	I take a long time to make decisions.	1	2	3	4
83	I often find myself lost for words.	1	2	3	4
84	I will actively put plans in place to accomplish goals in my life.	1	2	3	4