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ORIGINAL RESEARCH

Intrusive imagery and goals: a control theory perspective

Stuart Reid*

Five Boroughs Partnership NHS Trust, Enhanced Day Therapies, St Helens, UK

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Abstract. Recently, autobiographical memory theorists proposed that intrusive imagery contains important information about goals. This study examined thematic links between approach and avoidance goals in two groups: a clinical group ($n = 22$) and a non-clinical group ($n = 24$). Participants completed the Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM), Goals Task and an imagery interview. In the total sample, almost 90% of reported imagery matched at least one goal. Eighty-five percent of clinical participants reported imagery that matched avoidance goals, whereas only half of non-clinical participants' imagery matched an avoidance goal. The majority of imagery was found to be associated with a particular memory or a collection of memories for similar events. These findings support proposals that intrusive imagery contains important information about goals, and in particular states of the world to be avoided. Clinical implications and directions for future research are discussed.

Key words: Case formulation, control, intrusive cognitions, memory, qualitative methods.

Introduction

Control theories assert that psychological distress occurs due to unresolved conflict between personal goals (Powers, 1973, 2005; Mansell, 2005). According to control theory all living organisms are made up of a hierarchy of control systems. Within this hierarchy, each control system operates according to identical principles. The function of a control system is to keep current perception as near to a predefined goal standard as possible. Conflict is the specific situation where a predefined goal standard is not met because another predefined goal standard is in opposition and attempts are being made to achieve both of these standards simultaneously (Powers, 1973, 2005). Goal standards, also known as reference values, are either innate predispositions, e.g. hunger, and/or formed from past perceptual experiences, e.g. a desired body shape, which has been influenced by cultural norms. In his integrative account of control theory Mansell (2005) advises that conflict is a normal consequence of pursuing a variety of goals. In other words, it is normal for individuals to experience a lack of control. Control theories are supported by a wide body of research

*Author for correspondence: Dr S. Reid, Five Boroughs Partnership NHS Trust – Enhanced Day Therapies, Knowsley House, Peasley Cross Hospital, Marshalls Cross Road, St Helens WA9 3DE, UK. (email: coldreid@googlemail.com)

which converges on the idea that goal attainment is closely linked to affect (e.g. Carver & Scheier, 1998; Carver *et al.* 1999; Dickson & MacLeod, 2004) and that successful pursuit of personally meaningful goals is related to measures of subjective well-being (e.g. Emmons, 1996).

The basic unit of a control system is a feedback loop. Whereas negative feedback loops act to makes the discrepancy between perceived and ideal states smaller, positive feedback loops act to increase such discrepancies. Control, or goal attainment, is achieved by acting to oppose disturbances from the environment that would otherwise move perceptions away from their goal standards. The input function of a control system senses the present environment and the comparator detects environmental discrepancies deviating from the internal goal standard. The output function or behavioural response is performed to reduce sensed discrepancies. Thus, outputs or actions occur to maintain a specified perception of the environment (Powers, 1973, 2005).

Perceptual Control Theory (PCT) proposes that in living organisms' control systems are arranged hierarchically and in parallel. Control processes occurring at each level are identical, the only difference being that perceptions at one level are more complex than perceptions at a lower level. Within the hierarchy, a control system at one level controls its perceptual input by manipulating the reference values of feedback loops from control systems at lower levels. In human cognition, ideal-self representations, e.g. a kind person, or a hard worker are situated in the highest level of the hierarchy known as the system concept. The lowest level in the hierarchy, known as the intensity level, controls sensations, e.g. body temperature (Powers, 1973, 2005; Mansell, 2005). Thus, individuals, at any one time, can hold multiple goals at various levels within a goal hierarchy.

Discrepancy reduction for the most part takes place through the normal functioning of a negative feedback loop. An inability to reduce discrepancy leads to intrinsic error and a process called reorganization. Reorganization is a random process, guided solely by error reduction. As intrinsic error is sensed and reorganization makes random changes within the hierarchy. If a change reduces the sensed discrepancy then that change strategy persists. If on the other hand the discrepancy is not reduced, another random change strategy is initiated (Powers, 2005). Conflict is thought to involve at least three levels within the hierarchy, and in order for conflict to be resolved it is proposed that the highest level involved in the conflict needs to be reorganized, as reorganizing lower levels will have no lasting effect on conflict (Carey, 2006). From a PCT perspective reorganization occurs when an individual shifts their awareness to a higher level within the hierarchy (Mansell, 2005).

Research has demonstrated that intrusive imagery is a common phenomenom which occurs across psychological disorders as well as in psychologically healthy individuals (e.g. Hackmann & Holmes, 2004; Harvey *et al.* 2004). When it is recurrent, intrusive imagery can capture attention and impel individuals to respond in a manner that is intended to regulate or control its occurrence and associated distress (Wells & Matthews, 1994; Hackmann & Holmes, 2004; Mansell, 2005).

Within control theories intrusive imagery is considered a symptom of goal conflict (Mansell, 2005). Leading autobiographical memory theorists propose that one important function of intrusive imagery is to convey important information about personal goals that cannot be directly or consciously accessed. Furthermore, they argue that images are viewed as representations of goal standards and are highly associated with goals because they are close to actions (Conway *et al.* 2004*a*). Austin & Vancouver (1996) define goals as 'internal

representations of desired states, where states are broadly construed as outcomes, events or processes' (p. 338). Dickson & MacLeod (2004) differentiate between attempts to move from a present state towards a desired state (approach goals) and attempts to move away from some undesired state (avoidance goals). Within the Self-Memory System autobiographical memory model (Conway & Pleydell-Pearce, 2000) images derived from experience or otherwise are all thought to correspond to goals. More specifically, they correspond to the ideal, standard or referent in negative and positive feedback loops (Carver & Scheier, 1982, 1998).

Research over the past decade into the phenomenology of intrusive imagery across psychological disorders lends support to the claims that imagery contains important information about goals. In a number of studies the salient concerns of the particular disorder in question are often prominent in the content of intrusive imagery. For example, in body dysmorphic disorder, imagery tends to depict past situations involving criticism about appearance (Osman *et al.* 2004). In social phobia, imagery tends to depict the self looking or sounding anxious (Hackmann *et al.* 2000). In bipolar affective disorder specific memories which involved images were found to depict personal failures (Mansell & Lam, 2004). Somerville *et al*. (2007) report the content of imagery in an eating-disorder sample typically related to shape and weight. Although these findings concur with the notion that imagery contains important information about goals, none of these studies have actually asked participants directly about their personal goals when looking at intrusive imagery.

This study examined personal goals (approach and avoidance), the content of intrusive imagery and any associated memories in a clinical and non-clinical group. The primary aim was to explore thematic links between self-reported personal goals (approach and avoidance) and intrusive imagery.

Method

Participants

Forty-six individuals participated in the study. Participants were allocated to the clinical group if they scored above the clinical cut-off on the Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM; Evans *et al.* 2000) (1.19 males, 1.29 females) or had a current diagnosis of a mental health problem given by a health professional. Participants were allocated to the non-clinical group if they scored below the clinical cut-off on the CORE-OM and did not have a current diagnosis of a mental health problem. To be included in the study individuals had to be aged 18 or over. General exclusion criteria for the study included: a learning disability, pervasive developmental disorder or dementia, history of traumatic brain injury, and active psychosis or mania. There were 22 participants in the clinical group and 24 in the non-clinical group. The mean age of the clinical group was 33.7 years (S.D. = 9.38, range 18–50) and 15 (68.2%) were female. The control group was on average 35.25 years old (S.D. = 15.31, range 19–75), and 18 (75%) were female. The mean age did not differ significantly between groups [$t(44) = -0.414$, $p = 0.681$]. There were no significant differences between groups in terms of sex [$\chi^2(2) = 0.263$, $p = 0.608$], martial status [$\chi^2(2) = 1.559$, $p = 0.459$], employment status [$\chi^2(3) = 5.512$, $p = 0.138$], or ethnic background [$\chi^2(2) = 3.375$, $p = 0.115$].

All participants were reimbursed for their travel. Participants were recruited through a variety of means including: a university volunteer webpage, national mental health websites,

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local press articles, a BBC evening radio show, from general adult psychology services, and community mental health teams.

Measures

The following measures were used.

CORE-OM (Evans *et al.* 2000). Global psychological functioning was assessed using the CORE-OM. This measure is now widely used in clinical practice as a routine outcome measure by psychological therapists. It comprises 34 items addressing domains of *subjective well-being* (4 items), *symptoms* (12 items), *functioning* (12 items) and *risk* (6 items). Items are scored on a five-point scale from 0 ('not at all') to 4 ('most or all the time'). Psychometric properties of the CORE-OM have been calculated using an extremely large sample involving 890 clinical and 1106 non-clinical individuals (Evans *et al.* 2002) and demonstrated exceptional reliability and validity.

Goals Task (Dickson & MacLeod, 2004). This test was used to measure idiographic approach and avoidance goals. Goals refer to future experiences that individuals think they will typically be trying to accomplish or avoid. Participants were read the following prompts 'In the future it will be important for me to try to . . .' [approach goals], and 'In the future it will be important for me to try to avoid . . .' [avoidance goals]. Participants were given 75 seconds to describe verbally as many goals that came to mind within each goal condition. They were also asked to indicate on a scale of 0–10 ('not at all' to 'completely') the degree to which they felt they were attaining their goals. Goals were coded as approach or avoidance to check that responses were consistent with the instructions. The present author coded all responses.

Imagery Interview (based on Day *et al.* 2004). This interview schedule was devised to enable to the phenomenological nature of intrusive imagery to be examined. Participants were told:

> as well as thinking in words, some people think in mental imagery. Instead of words imagery contains aspects of our different senses. The majority of imagery is experienced in picture form. It can be 'still' (like a photograph) or 'moving' (like a video). Sometimes images are in black and white and sometimes they are in colour. Other senses that are involved in imagery include hearing, smell, taste and touch.

Each participant was asked to close their eyes and imagine a pleasant situation of their choice. Participants were then asked to describe the sensory characteristics of their chosen image in order to become familiar with the process of answering questions about mental imagery. Before proceeding to the next stage of the imagery interview, all participants had confirmed that they understood what was meant by the term mental imagery. Then participants were read the following:

> For the next part of the interview I am interested in imagery that pops into your mind without you having intended to think it, or imagery that pops into your mind against your will. It is **not** about imagery that you have deliberately thought about.

Participants were then asked if they had experienced any recurrent intrusive imagery in the past 2 weeks. Participants who endorsed the experience of intrusive imagery recently were asked to indicate if they experienced intrusive imagery several or more times a day, once a day, every few days, about once a week, or less than once a week. Those who confirmed a recent experience of intrusive imagery were then asked to close their eyes and re-create their chosen intrusive image, making it as vivid as possible so that a film director might be able to re-create the scene. Participants were then asked to describe their imagery, including all sensory modalities. Following this they were asked if there was a particular memory that was associated with their imagery.

Procedure

Participants were invited to take part in the study and had made either email or telephone contact with the researcher before the interview to check they met the inclusion criteria. The data reported here comes from a larger study which was undertaken as a ClinPsyD thesis. Therefore, in addition to the measures reported here participants completed a larger battery of measures, with the other measures being used to test several other hypotheses which are not reported here. Interviews were conducted at university premises, health service premises or in participants' own homes. Written informed consent was obtained prior to participation. Participants completed the CORE first, and then Goals Task and Imagery Interview were administered randomly, interspersed with other study measures. At the end of the interview, the researcher checked with participants that they were happy to finish. Questions and feedback on the interview were invited. At the end of participation, participants were debriefed, and given an opportunity to ask any questions. Interviews were recorded on a digital audio device. All interviews were transcribed verbatim. Recordings were deleted once data had been transcribed.

Analyses

All data were analysed by the author and matches between goals and imagery were also independently rated by a clinical psychologist to enable inter-rater agreement to be calculated using the kappa statistic. Ethical approval for the study was obtained from Salford, Bolton and Trafford Research Ethics Committee and the School of Psychological Sciences at the University of Manchester. All data were kept confidential, stored securely and anonymized.

Results

Nineteen (86.3%) clinical participants and 15 (62.5%) control participants completed the Imagery Interview ($n = 34$). It should be noted that five control participants who reported not currently experiencing intrusive imagery described imagery they had experienced spontaneously in the recent past. Data from these participants were included in the analyses. Table 1 shows descriptive data for the CORE-OM and Goals Task. Table 2 displays the frequency of matches between goals and imagery in both groups. Of the 19 clinical participants who reported intrusive imagery all identified a memory or collection of memories closely associated with their imagery. Of the 15 non-clinical participants who described imagery, 14 (93.3%) identified an associated memory. These findings substantiate that intrusive imagery

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Table 1. *Descriptive data for both groups for the CORE, and the goals task*

	Clinical		Non-clinical	
	Mean	(S.D.)	Mean	(S.D.)
CORE	1.70	0.52	.55	0.32
No. approach goals	3.27	1.16	3.25	1.07
No. avoidance goals	2.50	1.05	2.42	0.93
Self-reported approach goal attainment	5.61	2.22	6.33	1.35
Self-reported avoidance goal attainment	5.01	1.69	6.77	1.79

CORE, Clinical Outcomes in Routine Evaluation – Outcome Measure.

Table 2. *Matches between imagery and goal types*

	Clinical ($N = 19$)		Control ($N = 15$)		Total sample ($N = 34$)	
Imagery matches with . . .	*n*	%	*n*	%	*n*	%
. . . at least one approach goal	6	31.6	10	66.7	16	47.1
. . . at least one avoidance goal	16	84.2	7	46.7	23	67.6
. . . neither an approach nor an avoidance goal	2	10.5	2	13.3	4	11.8
At least one goal	17	89.5	13	86.7	30	88.2
An approach and an avoidance goal	5	26.3	4	26.5	9	26.5

is related to past experiences. Of this reported imagery, all clinical participants ($n = 19$) and 10 non-clinical (66.7%) reported negative or unpleasant imagery. Four (26.7%) non-clinical participants reported imagery they considered positive or pleasant and one considered their imagery as neutral.

As shown in Table 1 the majority of imagery reported matched at least one reported goal in both study groups. Cohen's kappa was calculated for imagery that matched onto at least one goal and emerged as 0.91, indicating a high level of agreement between raters. The clinical group had a higher percentage of imagery matching avoidance goals than the control group, and the control group had a higher percentage of imagery matching approach goals than the clinical group. The difference was statistically significant for avoidance goals (Fisher's exact test, $p = 0.030$), but not for approach goals (Fisher's exact test, $p = 0.082$). Nonetheless, these findings are consistent with the hypothesis that imagery contains information about personal goals. Qualitative examples of imagery and associated goals are given in Table 3.

Discussion

In a number of studies the salient concerns of the particular disorder in question are often prominent in the content of intrusive imagery (Wells & Hackmann, 1993; Day *et al*. 2004; Stopa & Bryant, 2004; Somerville *et al.* 2007), therefore implying that imagery contains information about goals. This is the first study to ask participants about their current goal pursuits as well as intrusive imagery. A key original finding was a strong association between reported goals and imagery. In the total sample almost 90% of individuals reported imagery that

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Table 3. *Examples of reported imagery and matching goals*

Age and sex	Content of imagery	Associated goal (s)
37 M	Walking about alone at school feeling different	To have a good social life and nice people around me
18 F	I can see myself with old friends having fun in London	To move back to London and work there
21 F	Family members criticizing my academic ability	To get degree, to live away from family
41 F	Grandma saying 'you'll end up just like your mother'	To avoid paying too much attention to what other people think
25 M	Friend's face close up, looking really messed up on drugs, loud music	Avoid taking drugs
32 F	Boyfriend's face looking really ill and skeletal, as if he is about to die	Keep partner happy Avoid contracting HIV
37 M	Grabbing man by the throat and taking him down by the legs, punching him	Avoid hurting other people and feeling inferior
35 F	Niece in hospital after suicide attempt with machines all over her	Poor mental health
22 M	I'm blushing, feeling hot and embarrassed	Making a fool of myself
23 F	I'm standing at the front of the lecture theatre, there is me and a small girl standing next to me. I'm tall and swaying like a tree and its like my body is getting fatter and fatter and my cheeks are getting really red. Sweat is dripping down my head	Avoid putting on weight and be thinner Avoid giving other people the opportunity to laugh at me
36 F	I can just see myself covered in blood and the nurses taking my unborn babies away. I can see them, even though I didn't see what they looked like. They are so small	To get pregnant and start a family
37 F	See myself taking overdose with wine and then I wake up in hospital hooked up on loads of machines	To get my mental health stabilized. To avoid having suicidal thoughts
36 F	I'm a teenager, mother shouting at her to do chores	Not to be overly ambitious with own children
36 M	Australian hills, smell of coffee	Enjoy holidays and travel
23 F	Babies, prams, mobiles	Have children before the age of 30
19 M	Being with a group of friends in the city centre, with music and rain	Maintain current friendships and build new ones
57 F	Train station, lots of people, lost daughter	Make sure family are healthy, happy and settled
30 F	My mum in my personal space, voice says 'this is ridiculous'	Get on well with family and avoid family disputes
32 F	Father not being able to move, no facial expression, drooling	Avoid poor health

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matched onto either an approach or an avoidance goal. Furthermore, significant group-wise differences were found for the percentage of images matching avoidance goals. Eighty-five percent of clinical participants reported imagery which matched at least one avoidance goal, whereas this was the case for only half of control participants. For a quarter of all participants imagery matched with both an approach and an avoidance goal. Participants in the present study were only asked to describe one image they had experienced intrusively, thus it is still possible that a match between goals and imagery existed for the 10% of participants where no match was found, but imagery that matched was not reported. Future studies may wish to consider asking participants to describe all intrusive imagery they experience.

These findings qualify claims made by Conway and his colleagues, who argue that imagery contains important information about goals in particular states of the world to be avoided (Conway *et al.* 2004*a*). However, they extend these claims and suggest that imagery can be both approach and avoidance goal-oriented, but in a clinical sample imagery is more often associated with avoidance goals. The finding that almost all reported imagery was negative and associated with a particular memory lends support to the notion that the referents or goal standards in feedback loops are formed from significant past experiences (Powers, 1973, 2005; Conway *et al*. 2004*a*; Mansell, 2005).

Clinical implications

This study demonstrated a relatively high prevalence of intrusive imagery in a clinical sample and that intrusive imagery is highly associated with avoidance goals. On this basis it is argued that both goals and intrusive imagery should be investigated routinely in a clinical assessment. Enquiring about imagery may prove a fruitful way of eliciting clients' goals or assisting clients to articulate their goals which can be otherwise difficult to access. Intrusive imagery within control theories is considered a symptom of conflict between goals and its recurrence is conceptualized as repeated attempts to reorganize conflict which has no lasting effect. It should be noted that PCT hypothesizes that in order for conflict to be resolved permanently information from higher levels within the control hierarchy must be accessed. Discussing intrusive imagery with clients may therefore help to identify potential sources of conflict within the hierarchy of control systems which are manifested as psychological distress, and may also enable them to access information from higher levels in the control hierarchy required to enable the conflict to be resolved permanently. The Method of Levels (MOL), an innovative form of cognitive therapy based on PCT (Powers, 1973, 2005) advises that shifting awareness to a higher level is necessary to resolve conflict. Helping individuals to shift their thought processes about imagery to a higher level using techniques outlined by Carey (2006, 2008) may be a helpful way of assisting individuals to resolve their conflicts and reduce the distress experienced by this common symptom of psychological distress. Alternatively, meta-cognitive approaches, such as enquiring about appraisals of the occurrence of imagery may enable awareness to be shifted to a higher level.

The fact that intrusive imagery was found to occur in psychological distress and in a non-clinical sample suggests it is an aspect of cognition that is trans-diagnostic. Other studies corroborate this (see Harvey *et al*. 2004 for a review). In clinical practice where comorbidity and complexity are becoming commonplace, using disorder-specific CBT protocols, e.g. social phobia (Clark & Wells, 1995) becomes more difficult. The findings of the present study provide preliminary evidence and a rationale for using goal-based information to inform interventions.

Using goal-based information and imagery to obtain this information, then focusing on conceptualizing the sources of conflict which maintain distress is a possible alternative way of working that may prove more powerful than inferring themes or concerns associated with diagnoses. Of course, more research is required in this area to quantify these claims.

Limitations and future research

A weakness of this study was that it did not ask participants if they considered any of their reported goals as conflictual. Future research may wish to ask participants if they consider any of their goals conflictual. However, goals in PCT are not defined by their observable behaviour but by the perceptual variable under control. For example, one might have a goal to avoid coming into contact with spiders, but may approach a spider in order to have a smaller perception of it, e.g. squashing it. In this way, what we consider unhelpful avoidance is really arbitrary control generating internal conflict within the individual, so it can be argued that conflict can be inferred within the existing design.

The method through which associations between goals and imagery was tested is open to criticism. Future research may wish to consider asking participants if they consider there are associations between intrusive imagery and reported goals. Moreover, separating participants' goal data and reported imagery and having an independent rater attempt to combine imagery data with goal data may be a more robust way of analysing the data. Finally, the study's design did not incorporate a diagnostic tool such as the structured clinical interview for DSM-IV, and relied on self-reported diagnosis made by mental health professionals. Future research may wish to use such a tool to partial out any effects of diagnosis.

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Declaration of Interest

None.

Recommended follow-up reading

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Learning objectives

(1) To have an understanding of the basic principles of control theories and how these relate to psychological difficulties.
(2) To become aware of available research in relation to the content of intrusive imagery across psychological disorders and how these may relate to personal goals.
(3) To become familiar with the clinical implications of the findings.
(4) To critique to the research methodology utilized and consider improvements for future research.