Investigating Change in Worry And Anxiety During Cognitive-Behavioural Therapy and Applied Relaxation for Generalized Anxiety Disorder

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Abstract

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The present study examined data from a controlled clinical trial comparing two types of psychotherapy for Generalized Anxiety Disorder (GAD): Cognitive-Behavioural Therapy (CBT), and Applied Relaxation (AR). The goal of this study was to examine precedence of change in worry and anxiety in CBT and AR. According to the interacting subsystems model of anxiety, change in the cognitive aspect of anxiety (worry) may lead to change in the somatic aspect (physiological anxiety), and vice-versa. It was hypothesized that in CBT, change in worry would precede change in anxiety, and conversely, that in AR change in anxiety would precede change in worry. Twenty participants (CBT $\underline{n}$ = 10; AR $\underline{n}$ = 10) completed daily ratings of worry and anxiety during therapy. Using Time-Series Analysis (Tiao & Box, 1981), the causal impact of each variable on the other was assessed. Results showed no differences between the treatment groups; however, the majority of participants (70%) had a bi-directional relationship between worry and anxiety. A contingency analysis showed a near-significant trend suggesting that treatment responders were more likely to have a bi-directional causal relationship between worry and anxiety. These results appear to be consistent with the interactive subsystems model of anxiety.

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Introduction

Generalized Anxiety Disorder (GAD) is a disturbance characterized by excessive, uncontrollable worry, accompanied by symptoms such as agitation, muscle tension, irritability, and sleep disturbance (American Psychiatric Association, 1994). GAD has a lifetime prevalence of 5%, affecting approximately one out of twenty people at some time during their lives (Wittchen, Zhao, Kessler, & Eaton, 1994). Studies have shown that individuals with GAD have higher consultation and comorbidity rates than individuals diagnosed with other anxiety disorders (Dugas et al., 1998). Such findings as these have increased research interest in the treatment of GAD, and recent advances have led to highly effective interventions for this disorder. For example, Behaviour Therapy (BT), Cognitive Therapy (CT), Cognitive-Behavioural Therapy (CBT), and Applied Relaxation (AR) have been shown to be effective in the treatment of GAD (Arntz, 2003; Barlow, Rapee, & Brown, 1992; Butler, Fennel, Robson, & Gelder, 1991; Dugas et al., 2003; Durham & Turvey, 1987; Ladouceur et al., 2000; Öst & Breitholtz, 2000; Tarrier & Main, 1986).

Of the treatments mentioned above, CT, CBT, and AR are the most commonly used in the treatment of GAD (see Durham & Allan, 1993, for a review). The results of some clinical trials suggest that CBT may offer an advantage over CT or AR (Borkovec & Costello, 1993; Borkovec, Newman, Pincus, & Lytle, 2002). However, the CBT

tested in these trials included AR strategies, making inferences about the superiority of CBT over AR or CT difficult. A clinical trial is currently being conducted by Dugas and colleagues, in which AR is compared with a form of CBT that includes no relaxation component; this research should help to clarify the relative efficacy of CBT, CT, and AR. Currently, however, the status of these three therapies is largely equivalent in terms of efficacy. This fact is surprising given that interventions such as CT and AR target widely different aspects of GAD: the cognitive and physiological aspects, respectively. A case in point is the study described by Dugas et al. (2003), in which a CBT that did not target physiological anxiety led to clinically significant change in both cognitive and physiological anxiety for the majority of clients.

Borkovec and colleagues recently conducted a comparative trial whose results support previous data showing equal efficacy of CT and AR in the treatment of GAD (Borkovec et al., 2002). These researchers suggested that their results might be due to a process in which change in one aspect of anxiety (i.e., cognitive or physiological) leads to change in other aspects. For example, in AR, change in the physiological anxiety subsystem may lead to change in the cognitive anxiety subsystem; and in CT, change in the cognitive subsystem may lead to physiological change. Borkovec and colleagues therefore hypothesized that CT and AR may be equally effective because each treatment

successfully creates change in one anxiety subsystem, which then generalizes to other systems, resulting in overall improvement.

This proposal is consistent with work pioneered by Lang (1971) and Rachman (1978) on the subsystems model of anxiety reactions. According to this view, anxiety is not a unitary experience, but is best understood in terms of relatively distinct physiological, behavioural, and subjective aspects. Beck and Clark (1997) recently described a four-subsystem model of anxiety that is based on this earlier work. Their model includes four loosely connected, semi-independent response subsystems of cognition, affect, physiology, and behaviour. While researchers have historically conceptualized the subsystems of anxiety in a variety of ways (i.e., Barlow, 2000; Beck, Emery, & Greenberg, 1985; Hugdahl, 1980), most models can be understood in terms of these four basic components. Research has in fact shown that these anxiety subsystems are related, but have a large degree of independence. Specifically, subjective, physiological, and behavioural reactions are often discrepant in anxiety states; in other words, there is desynchrony among anxiety subsystems (Hodgson & Rachman, 1974; Lang, 1971, 1978, 1983). For example, Craske and Craig (1984) found that while behavioural, physiological, and self-report measures of performance-induced anxiety were related, they showed considerable variation. Similar results emerged from a study by Calvo and Miguel-Tobal (1998) who found that an anxiety induction produced only

moderate concordance between measures of behavioural, physiological, and subjective anxiety. Findings such as these support the proposal that aspects of the anxiety response have some measure of independence.

Further support for the relative independence of anxiety subsystems can be inferred from research on constructs representing these systems. For example, worry (representing the cognitive subsystem) and anxiety (representing the physiological and affective subsystems) can be both conceptually and statistically differentiated. Worry has been defined as a verbal-linguistic cognitive process that concerns potential negative future events (Borkovec, Robinson, Pruzinsky, & DePree, 1983; Freeston, Dugas, & Ladouceur, 1996). Conversely, anxiety has been defined as feelings of fearfulness and apprehension, accompanied by physiological sensations such as palpitations or trembling (Lang, 1978; Rachman, 1998). A number of studies support this distinction. In some early research from the test anxiety literature, Morris and Liebert (1970) found that self-reports of worry related to significantly poorer test performance, but that reports of affective anxiety did not. More recently, research has shown that cognitive and physiological aspects of anxiety can be reliably differentiated using self-report measures (Steptoe & Kearsley, 1990). In addition, Schwartz and colleagues found that cognitive and physiological anxiety represent distinct factors on a widely-used self-report measure, (the Cognitive-Somatic Anxiety Questionnaire: Schwartz, Davidson, &

Goleman., 1978). Further research using the aforementioned questionnaire has shown that while worry and physiological anxiety are highly related, measures of negative affect are more highly related to physiological anxiety, whereas poor problem solving style is more highly related to worry (Zebb & Beck, 1998). Finally, studies carried out by Davey and colleagues show that while worry and trait anxiety are related, they have distinct relationships to coping and problem-solving styles (Davey, 1993; Davey, Hampton, Farrell, & Davidson, 1992). Taken together, this research, combined with the literature on desynchrony, supports the proposal that anxiety can be understood in terms of subsystems. Further, this research suggests that anxiety subsystems do have some degree of independence; therefore, it should be possible to obtain measurements of the different subsystems.

One way to shed light on the mechanisms at work in CBT and AR may be to examine change in these anxiety subsystems during treatment. Time-Series Analysis is a statistical tool that can be used to assess the impact of variables on each other over time, as well as the mutual interaction of these variables. Furthermore, Time-series allows for an examination of these effects on an individual basis, and can provide valuable information about the complex processes underlying psychopathology. For example, Time-series has been used to examine the relationships between variables such as mood and compulsive behaviour in Obsessive-Compulsive-Disorder (Junginger & Head,

1991), and strength of beliefs about the danger of bodily sensations and apprehension of panic attacks in Panic Disorder (Bouchard, 1995). In these studies, Time-Series Analysis provided an examination of time-lagged relationships between key variables related to each disorder. In addition, Time-Series Analysis allowed the establishment of precedence of change in variables. For example, change in beliefs in the danger of bodily sensations was found to precede change in the apprehension of panic attacks for the majority of participants in the Bouchard (1995) study. One treatment study used Time-Series to examine the relationship between a cognitive process underlying GAD (intolerance of uncertainty) and change in worry during CBT. In this study, it was possible to show that change in intolerance of uncertainty preceded change in worry for 3 out of 4 participants, suggesting that changes in intolerance of uncertainty predict changes in the excessive worry characteristic of GAD (Dugas & Ladouceur, 2000). These findings were supported by an extension to this study, in which precedence of change in intolerance of uncertainty was established for 9 out of 16 participants (Dugas, Langlois, Rhéaume, & Ladouceur, 1998). While previous research using Time-Series Analysis has therefore examined time-lagged relationships between processes underlying anxiety disorders, this technique has yet to be used to directly test the interacting subsystems theory of anxiety outlined by Beck and Clark (1997).

Furthermore, this technique has never been used to compare change in anxiety subsystems during two types of psychotherapy for GAD.

Time-Series Analysis is therefore an appropriate technique for the exploration of the interacting subsystems theory of anxiety, and for exploring the mechanisms of effective treatments for GAD. A further advantage of Time-Series Analysis is that it permits the examination of change on an individual basis. Researchers have become increasingly interested in the processes of psychotherapy at the individual level (i.e., Lutz, 2003). While group differences in therapy outcomes offer critical information about the efficacy of therapy, this type of research cannot provide information about the mechanisms of therapy, nor about individual differences that may predict treatment success. While recent research on psychotherapy processes has shed much light on the characteristics of clients, therapy, and therapists that relate to treatment outcome (see Orlinsky, Grawe, & Parks, 1994, for a review), a more detailed analysis of individual change during therapy may be useful. Few studies have examined the processes of change on a single-subject basis; this may be due in part to the time-consuming process of collecting repeated measures for single subjects, or to current pressures to demonstrate treatment efficacy at the group level. Whatever the reason, some researchers have proposed that a return to the study of single cases is an essential step

for the advancement of psychotherapy process research (Barlow, 1984; Hilliard, 1993; Jacobson & Truax, 1991).

The goal of the present study was to examine change in anxiety subsystems for patients with GAD who received either CBT or AR in the clinical trial being conducted by Dugas and colleagues, described in the introduction. The CBT and AR employed in this study were distinct techniques, specifically targeting cognitive (CBT) and physiological (AR) aspects of anxiety. Three anxiety subsystems were measured during therapy for each participant: worry (cognitive subsystem) and anxiety (physiological and affective subsystems). It is important to note that the measurement of anxiety used in the present study represents two subsystems. As previously outlined, worry is primarily cognitive; however, anxiety has a large affective component, which formed part of ratings made by participants in the current study (i.e., anxiety as both fearfulness and sympathetic physical arousal; see Procedure). The time-lagged influence of worry and anxiety was examined for each participant using Time-Series Analysis. Causality testing was carried out to assess whether changes in worry would predict changes in anxiety, and whether changes in anxiety would predict changes in worry. A related goal was to investigate the mechanisms of CBT and AR using Time-Series Analysis. Therefore, group differences were examined to determine whether the effects described above differed for CBT versus AR. Specifically, it was hypothesized that since cognitive

anxiety was targeted in CBT, changes in worry would uniquely predict changes in anxiety for this condition, i.e., worry would predict anxiety, but anxiety would not predict worry. Conversely, as physiological anxiety was targeted in AR, it was hypothesized that changes in anxiety would uniquely predict changes in worry for AR. Besides these two possibilities, it was proposed that worry and anxiety might share a mutually causal, bi-directional relationship. Measures of treatment response by questionnaire and percent change in self-rated worry and anxiety were also used to explore group differences.

Method

As the participants for this study were taken from a larger clinical trial comparing CBT and AR in the treatment of GAD, only a summary of the procedure follows; references are provided for further information.

Participants

Participants for this study were a subsample of GAD patients who completed treatment in a clinical trial currently underway at the Clinique des Troubles Anxieux of the Sacré-Coeur Hospital of Montreal. Participants for the clinical trial, which compares CBT and AR for GAD, were recruited from the regular Francophone patient flow at the clinic. Each potential participant was independently assessed by a clinic psychiatrist using the French version of the Mini International Neuropsychiatric Interview (MINI:

Sheehan et al., 1998), and by a graduate student trained in the administration of the French version of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV: Di Nardo, Brown, & Barlow, 1994). Participants were included in the study if they met the following criteria: a primary diagnosis of GAD as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994), where any comorbid disorders were less severe than GAD (at least 2 points less severe than GAD on a 9-point severity scale); willingness to undergo randomization; willingness to hold medication (type and dose) constant for 12 weeks prior to treatment and during therapy; no evidence of suicidal intent or current substance abuse; no evidence of current or past bipolar disorder, schizophrenia, or organic mental disorder.

Out of the 44 participants who had completed treatment at the time of this study, 36 had almost no missing self-monitoring data (defined as one or no missing datapoints). As the planned Time-Series Analysis requires serial and consecutive datapoints, participants for the current study were selected from this subsample. The final sample for this study was made up of 20 participants: 10 participants randomly selected from the CBT condition, and 10 participants randomly selected from AR condition. The sample included 14 females and 6 males ranging in age from 18 to 58, with a mean of 38.53 (SD = 11. 78). Sixty percent of the sample had no comorbid diagnoses; 30% of the

sample had one comorbid diagnosis, and 10% had two comorbid diagnoses (comorbid diagnoses were primarily other anxiety disorders). Seventy percent of participants in the sample were taking psychotropic medication.

Measures

The Mini-International Neuropsychiatric Interview (MINI: Sheehan et al., 1998) is a brief structured interview that assesses the major Axis I disorders according to DSM-IV and ICD-10 criteria. While the MINI takes only 20-30 minutes to administer, it has shown good validity compared to longer measures such as the Structured Clinical Interview for DSM-III-R (SCID-P: Spitzer, Williams, Gibbon, & First, 1990). The MINI has been translated into several languages, and is an internationally-applied tool used in the evaluation of clinical trials.

The Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV: Di Nardo et al.,1994) is a detailed diagnostic interview that assesses a range of DSM-IV Axis I disorders, with a focus on differential diagnosis between the anxiety disorders. The ADIS-IV provides the advantage of a severity rating for each disorder, in addition to a rating of presence or absence. The ADIS-IV is widely used in research and clinical trials for anxiety disorders.

A daily self-monitoring booklet was given to participants at the beginning of each week they were in therapy. The self-monitoring booklets included separate pages

on which participants were asked to rate the percentage of the day they spent worrying, feeling anxious, and feeling depressed (see Appendix 1). Participants were asked to make ratings on a Likert-type scale of 0-100%, with 0% indicating no worry, anxiety, or depression, and 100% indicating continuous worry, anxiety, or depression throughout the day. The final page of each booklet included daily monitoring of medication use to ensure stability of dose throughout treatment. As ratings of depression and medication did not form part of the present study, however, only worry and anxiety will be discussed. These booklets are based on those used in previous clinical trials for GAD (Dugas & Ladouceur, 2000; Dugas et al, 2003); and research has shown that this type of daily self-rating of worry correlates significantly with scores on the Penn State Worry Questionnaire, a widely-used standard measure of worry (Dupuy, Beaudoin, Rhéaume, Ladouceur, & Dugas, 2001).

Self-report questionnaires assessing GAD symptoms were also administered to participants at pre- and post-treatment. Of these, two questionnaires were of interest to the present study: The Penn State Worry Questionnaire (PSWQ: Meyer, Miller, Metzger, & Borkovec, 1990) , a 16-item measure of uncontrollable and excessive worry. The PSWQ has excellent internal consistency, α = .86 to .95, test-retest reliability, r = .74 to .93, and has shown evidence of convergent and divergent validity (Molina & Borkovec, 1994). The Worry and Anxiety Questionnaire (WAQ: Dugas et al., 2001) is

an 11 item measure that assesses DSM-IV diagnostic criteria for GAD. The WAQ also contains a somatic subscale which provides a specific assessment of GAD somatic symptoms. The WAQ has demonstrated both reliability and criterion validity (Dugas et al., 2001).

Cognitive-Behavioural Therapy

Participants in this condition received 12 weekly sessions of CBT, administered by one of two experienced therapists at the Clinique des Troubles Anxieux. The manualized treatment was based on that used in previous clinical trails conducted by Dugas and colleagues (Dugas et al. 2003; Dugas & Ladouceur, 2000). The treatment included the following main components: 1) Presentation of treatment rationale: participants were introduced to the CBT model of GAD, and the processes underlying excessive worry; 2) Worry awareness training: various strategies were used to increase participants' awareness of their worries, and a distinction was made between worries relating to actual versus potential problems; 3) Addressing intolerance of uncertainty: as intolerance of uncertainty has been shown to be a key process underlying worry, strategies were used to increase participants' tolerance for uncertainty; 4) Re-evaluation of positive beliefs about worry: techniques were used to increase participants' awareness of their beliefs in worry as a useful coping strategy; these beliefs were re-evaluated with cognitive and behavioural hypothesis testing; 5) Problem-solving training: participants

applied problem-solving skills to actual problems identified earlier in therapy, using basic problem-solving steps: positive problem orientation, problem definition, solution generation, decision making, and implementation and verification; 6) Cognitive exposure: using worries about hypothetical events identified earlier, participants recorded a feared scenario on a looped tape and engaged in cognitive exposure by listening to the tape until their anxiety decreased. Final sessions were used to evaluate residual manifestations of processes targeted during treatment, and plan for situations that might lead to relapse.

Applied Relaxation

Participants in this condition also received 12 weekly sessions of treatment, administered by the therapists described above. The AR treatment was based on techniques implemented by Borkovec and colleagues (Berstein & Borkovec, 1973; Borkovec & Costello, 1993). The AR treatment included the following components: 1) Presentation of treatment rationale: participants were presented with the goals of therapy, and the rationale for using relaxation techniques to decrease anxiety and worry; 2) Tension-release training: Participants were taught to tense and then relax all the muscles in their bodies, beginning with 16 muscle groups, and reducing the number of groups until the participant could achieve total relaxation using only 4 muscle groups; 3) Relaxation by recall: participants learned to relax the 4 muscle groups without first

tensing them; 4) Relaxation by counting: participants integrated a "countdown" from 10 to 0 at the end of their relaxation sessions; with practice, participants were able to achieve relaxation using counting alone. In addition, participants practiced attaining relaxation by counting in increasingly challenging situations. Final sessions were devoted to revisiting aspects of the training where necessary, and identifying potential risks for relapse.

Procedure

Patients who were eligible for the clinical trial were provided with a detailed form describing the study procedures (see Appendix 2). Participants who gave informed consent and met entry criteria for the clinical trial were randomly assigned to either CBT or AR, with one-third of participants first undergoing a waiting period. The use of the self-monitoring booklets was explained by the therapist during the first treatment session. The distinction between worry and anxiety was emphasized; i.e., worry as cognitions about negative future events, and anxiety as feelings of fearfulness and sympathetic physical arousal (Zebb & Beck, 1998). The therapist encouraged participants to make their ratings of worry and anxiety at the same time each day, and record the subtle changes in each symptom that occur from day to day, rather than rounding off ratings; these recommendations maximized the validity of the self-monitoring (Dupuy et al., 2001).

As part of the clinical trial, participants were asked to fill out measures of GAD symptoms and processes at pre- and post-treatment, as well as follow-ups. For the present study, the Penn State Worry Questionnaire and the somatic subscale of the Worry and Anxiety Questionnaire were analyzed at pre- and post-test to provide a measure of treatment response.

Data Analysis

A single-subject design was used in this study, with daily self-ratings analyzed individually for each participant. While all participants received 12 sessions of therapy, some participants took longer to complete treatment due to delayed sessions. The total number of ratings therefore varied between participants, ranging from 77 to 134 datapoints, with a mean of 90.55 (SD = 18.99); this is an appropriate number of datapoints for Time-Series Analysis (McLeary & Hay, 1980). Appendix 3 shows graphs of the daily worry and anxiety ratings for each of the 20 participants. While graphs cannot be directly interpreted to obtain a model, they can be useful in the model-building process.

The repeated ratings of worry and anxiety collected in this study could not be appropriately analyzed with conventional tests such as ANOVA, as they violate the statistical assumption of independence. Therefore, Time-Series Analysis was used in this study to evaluate the process of change in each participant's ratings of worry and anxiety

over the course of therapy. Time-Series Analysis is ideal for this type of data, as it uses the serial dependency of scores to generate a model for each participant. The dependency of scores is specified in a model with two components: the autoregressive (AR) component, and the moving average (MA) component. This technique is therefore known as vector ARMA modelling (Tiao & Box, 1981). A particular strength of Time-Series Analysis is that it allows the joint testing of two variables, as well as the evaluation of their impact on each other over time. Therefore, in a procedure outlined by Granger (1969) and Weiner (1956), if the parameters defining one variable are held constant, and the fit of the model is significantly compromised, it can be concluded that the model needs to take into account the impact of that variable. Using this "causality testing" technique, therefore, a variable can be tested for its predictive or "causal" impact on another variable over time.

Results

Single-Subject Analyses

Individual Model Building

Individual Time-Series models were identified using Time-Series software by Scientific Computing Associates (Liu & Hudak, 1995). Model building consisted of four basic steps, with both worry and anxiety series tested jointly, as recommended by Tiao and Box (1981). The first phase of analysis involved identifying tentative models based

on cross- and extended cross-correlations, stepwise autoregressions, and smallest canonical correlations. The second estimation step required fitting candidate models to the data using an exact likelihood function, and obtaining indices of fit such as residuals following the fit. The third diagnostic step involved applying diagnostic indices to the residual series, and selecting the best model for each individual's data. The best-fitting model produces few or no residuals; if residuals are present, they exhibit a random noise pattern. In addition, as Lüktepohl (1985) has argued that the best-fitting model for a series of data also has the lowest Schwarz Bayesian Criterion (SBC), this criterion was also used. Finally, constraints were applied by setting non-significant parameters to zero; this was only done if parameter estimates were significantly smaller than their standard errors, and when constraints resulted in an improved fit for this "restricted" model. After these steps were carried out, a mathematical model for the data was generated, which was used to carry out causality testing. Table 1 summarizes the models identified for each participant, with indices of model adequacy. As can be seen, it was possible to obtain a model for all participants, although some models were highly complex. While in most cases a small number of residuals remained after the final model fit, these were the best possible models for the data; furthermore, the residuals exhibited a random pattern.

Table 1.

Summary of ARMA Models for Each Participant with Indices of Model Adequacy

Subject No.	AR Parameters	MA Parameters	SBC	Residuals exceeding critical χ^2 value
1	4	1,6	746.70	1
2	4	1,8	964.76	2
3	1	1,3,5	1080.22	3
4	1	3,14	911.92	0
5	1,3	4	760.03	2
6	1,5,8,10	8	483.14	3
7	1,4,6,8,10	--	595.43	3
8	1	1	803.45	3
9	2,4,6,8	--	768.34	0
10	1,4,6	2,3	1567.63	1
11	1,2,3,4,5,6,7,8	--	663.29	7
12	1	9	1042.35	0
13	1,3,9	3	468.59	3
14	2	1	957.34	1
15	1	1	883.62	2
16	1	2,4	1327.35	0
17	1,3,6,7,9	1	1136.46	4
18	1,9	11	1368.45	1
19	1,2	2,9	1026.28	4
20	1,3	1	535.12	5

Note: AR = Autoregressive parameters; MA = Moving average parameters; SBC = Schwarz's bayesian criterion, reported for the final restricted model. For participants 11, 17, 19, & 20, these were the best possible models for the data, despite a slightly higher number of residuals.

Causality Testing

In vector ARMA models, causality implies that change in a variable at one time predicts change in another variable at a later time. For the current study, causality testing evaluated the null hypotheses that levels of worry did not predict later levels of anxiety; and conversely, that levels of anxiety did not predict later levels of worry. As specified by Granger (1969) and Weiner (1956), causality testing can be carried out by setting to zero the parameters describing the time-lagged impact of a variable on a second variable. If setting this parameter to zero significantly compromises the fit of the model, that variable can be considered to have a causal or predictive impact on the second variable. A χ^2 analysis is used to test the adequacy of the model's fit following the constraining of each variable. Table 2 provides a description of the causality tests carried out for each participant, and Table 3 summarizes these effects. As can be seen in Table 3, 14/20 (70%) of participants showed a bi-directional effect between worry and anxiety; in other words, for the majority of participants, levels of worry predicted later levels of anxiety, and levels of anxiety predicted later levels of worry. Other types of effects were less prominent: for 2/20 participants (10%), worry uniquely predicted later anxiety; for 1/20 participants (5%), anxiety uniquely predicted worry; and for 3/20 participants (15%), there was no predictive effect of either worry or anxiety.

Table 2.

Causality Testing for Each Participant

Participant No.	Representation of H°	Parameter(s) constrained[a]	χ^2	df	p
1	Worry - / → Anxiety	$\phi^4_{21} = 0$	9.66	1	.002
	Anxiety - / → Worry	$\phi^4_{12} = 0$	4.81	1	.03
2	Worry - / → Anxiety	$\theta^8_{21} = 0$	--		--
	Anxiety - / → Worry	$\theta^8_{12} = 0$	--		--
3	Worry - / → Anxiety	$\theta^1_{21} = 0$	16.65	1	.000
	Anxiety - / → Worry	ns			
4	Worry - / → Anxiety	$\phi^1_{21} = 0$	10.30	1	.001
	Anxiety - / → Worry	$\theta^3_{12} = 0$	11.92	1	.000
5	Worry - / → Anxiety	$\phi^4_{21} = 0$	18.61	1	.000
	Anxiety - / → Worry	$\phi^3_{12} = 0$	6.31	1	.01
6	Worry - / → Anxiety	$\phi^{10}_{21} = 0$	24.67	1	.000
	Anxiety - / → Worry	$\phi^{10}_{12} = 0$	14.28	1	.000
7	Worry - / → Anxiety	$\phi^1_{21} = 0$	15.78	1	.000
	Anxiety - / → Worry	$\phi^6_{12} = 0$	16.13	1	.000
8	Worry - / → Anxiety	ns			
	Anxiety - / → Worry	$\phi^1_{12} = 0$	9.59	1	.002
9	Worry - / → Anxiety	$\phi^8_{21} = 0$	4.53	1	.03
	Anxiety - / → Worry	$\phi^8_{12} = 0$	4.80	1	.03
10	Worry - / → Anxiety	$\phi^1_{21} = 0$	20.83	1	.000
	Anxiety - / → Worry	$\phi^1_{12} = 0$	56.45	1	.000

11	Worry - / → Anxiety	$\phi^2_{21} = 0$	31.54	1	.000
	Anxiety - / → Worry	$\phi^1_{12} = 0$	12.55	1	.000
12	Worry - / → Anxiety	ns			
	Anxiety - / → Worry	ns			
13	Worry - / → Anxiety	$\theta^3_{21} = 0$	10.81	1	.001
	Anxiety - / → Worry	$\phi^3_{12} = 0$	12.57	1	.000
14	Worry - / → Anxiety	ns			
	Anxiety - / → Worry	ns			
15	Worry - / → Anxiety	$\theta^1_{21} = 0$	7.87	1	.005
	Anxiety - / → Worry	$\theta^1_{12} = 0$	16.86	1	.000
16	Worry - / → Anxiety	$\theta^4_{21} = 0$	20.83	1	.000
	Anxiety - / → Worry	ns			
17	Worry - / → Anxiety	$\phi^9_{21} = 0$	5.98	1	.02
	Anxiety - / → Worry	$\theta^1_{12} = 0$	13.84	1	.000
18	Worry - / → Anxiety	$\theta^1_{21} = 0$	132.81	1	.000
	Anxiety - / → Worry	$\theta^1_{12} = 0$	4.94	1	.03
19	Worry - / → Anxiety	$\phi^2_{21} = 0$	6.60	1	.01
	Anxiety - / → Worry	$\phi^2_{12} = 0$	43.33	1	.000
20	Worry - / → Anxiety	$\theta^1_{21} = 0$	8.05	1	.004
	Anxiety - / → Worry	$\theta^1_{12} = 0$	10.96	1	.000

Note: [a]Phi (ϕ) represents an AR parameter. Theta (θ) represents an MA parameter. (ns) refers to a parameter that was not significant at any lag; a test was therefore not carried out as lack of causality was thereby demonstrated. (--) represents a non-significant χ^2 value (failure to reject H^o).

Group Differences

Percent change in worry and anxiety

The median percent change in daily self-ratings of worry and anxiety was calculated for CBT and AR. Percent change in worry and anxiety was obtained for each individual by subtracting the mean ratings of the last two weeks of therapy (post) from the mean of the first two weeks (pre). This difference was then divided by the pre score, and the resulting percentage used as a rough estimate of change. Due to an inflated standard deviation in the CBT group, the median was considered a more representative measure than the mean. The median percent change in worry and anxiety was similar in the two treatment groups. In the CBT condition, the median change in worry was 55%, and in anxiety, 47%. In the AR condition, the median change in worry was 66%, and in anxiety, 50%. An independent samples t-test showed no significant difference between CBT and AR in average percent change in worry (t (18) = -1.49. p = .16). A second independent samples t-test showed no significant difference between CBT and AR in average percent change in anxiety (t (18) = -1.31, p = .21).

Table 3.

Summary of Effects Demonstrated by Causality Testing

Direction of change	Number of cases	Percentage of Total
Worry → Anxiety	2	10%
Anxiety →Worry	1	5%
Bi-directional Relationship Between Worry and Anxiety	14	70%
No causal relationship	3	15%

Treatment Response

Treatment response was assessed by examining pre- to post-treatment changes in the questionnaire measures of worry (PSWQ) and GAD somatic symptoms (WAQ somatic subscale). Treatment response was defined as a 20% or greater improvement on both of these measures; participants who had not attained a 20% improvement on both measures were considered non-responders. Following treatment, 13/20 participants (65%) met criteria for treatment response, and 7/20 (35%) were considered non-responders. More specifically, 6/10 (60%) of participants in the CBT condition were treatment responders, and 7/10 (70%) of participants in the AR condition were treatment responders.

Contingency Analyses

In this phase of analysis, individual participants were grouped according to the type of causal effect found for their data, the type of treatment they received, and their treatment response status. Two-way contingency tables were calculated to examine differences of participant frequencies among these categories. As the sample size was small and expected cell counts less than 5, Fisher's exact test for independence was used (Lowry, 2004). The first contingency analysis tested whether there was a difference in the number of treatment responders between the two treatment groups. The two variables were type of treatment (with 2 levels, CBT and AR) and treatment response

(with 2 levels, responders and non-responders). Results showed that there was no significant difference between the number of treatment responders in the CBT versus AR conditions (60% versus 70%, respectively; two-sided Fisher's exact test $p = 1.00$; Cramér's $V = .11$). As the majority of participants showed a bi-directional relationship between worry and anxiety, a second contingency analysis examined whether the same proportion of participants showed a bi-directional relationship in the two treatment groups. The two variables for this analysis were treatment (with 2 levels, CBT and AR) and type of effect (with 2 levels, bi-directional and other effect). Results showed that the same proportion of participants had a bi-directional relationship in the CBT and AR groups (70% and 70%). A final contingency analysis tested whether the same proportion of treatment responders versus non-responders showed a bi-directional relationship in their data. The two variables for this analysis were treatment response (with 2 levels, responders and non-responders) and type of effect (bi-directional and other effect). Results showed a non-significant statistical trend suggesting that more treatment responders had a bi-directional relationship than non-responders (responders 85%, non-responders 43%: Fisher's exact test $p = .12$; Cramér's $V = .44$). While this test did not reach statistical significance, the medium effect size (.44) suggests that this may have been due to the small sample size. However, as these analyses were exploratory, the results must be interpreted with caution.

Discussion

While an adequate model for each participant was obtained using Time-Series, analyses at the group level showed no differences between the two types of therapy. First, descriptive statistics showed a similar median percent change in self-rated worry and anxiety in CBT and AR. In addition, t-tests showed that the percent change in self-rated worry and anxiety was unrelated to the type of treatment participants received. Further, Time-Series causality tests did not support the hypothesis that change in worry would uniquely predict change in anxiety in the CBT condition, and that change in anxiety would uniquely predict change in worry for the AR condition. In fact, a clear majority of participants (70%) showed a bi-directional relationship in which worry and anxiety equally predicted each other; this effect was unrelated to the type of treatment participants received. While 65% of the participants met criteria for treatment response by questionnaire, there was no significant difference between CBT and AR in the number of treatment responders. A contingency analysis, however, showed a statistical trend suggesting that treatment responders were more likely to have a bi-directional relationship between worry and anxiety, regardless of treatment group.

The fact that Time-Series testing did not show a uniquely predictive effect of worry in CBT, or of anxiety in AR, is surprising since each treatment was extremely specific in the symptoms it targeted. Furthermore, treatment integrity was carefully

monitored to ensure that participants in the CBT condition only received interventions concerning worry and cognitive processes; similarly, participants in the AR condition only received interventions targeting physiological anxiety. Therefore, it is highly unlikely that the lack of group differences found in these analyses was due to a lack of specificity in the interventions.

The finding of a similar type of causal relationship between worry and anxiety for most participants in this study may be consistent with the suggestion by Borkovec et al. (2002), that change in any one anxiety subsystem will generalize to other subsystems. In the present study, the prevalence of this type of bi-directional relationship may reflect this type of mutual subsystem interaction. This proposal is moreover consistent with the interacting subsystems model of anxiety reviewed earlier. If, as this model proposes, the cognitive and physiological aspects of anxiety are loosely connected subsystems, the finding that change in one system leads to change in another is not surprising; neither is the proposal that these subsystems may mutually influence each other, i.e, show a bi-directional causal relationship. This interpretation makes sense on a clinical level: it is difficult to imagine that one aspect of a disorder could change without having an impact on another aspect. This may be particularly true among clients who are successfully treated and demonstrate clinically significant change – in other words, among treatment responders.

The finding that treatment responders were somewhat more likely to show a bi-directional relationship between worry and anxiety raises the question of the mechanism underlying this relationship. For example, is an individual variable such as treatment response reflected in a specific type of interaction within the anxiety system (bi-directional)? Conversely, does a bi-directional relationship between subsystems increase the likelihood of treatment response? A third possibility is that treatment response in one subsystem may lead to response in a second subsystem; this change may then "feedforward" to the first subsystem, so that a bi-directional relationship is set in motion. As Bouchard (1995) points out, the presence of a bi-directional relationship does not rule out the possibility that change in one variable may have preceded and initiated the bi-directional relationship that appears between two variables. However, the initiation of the process of interaction may be too subtle to be differentiated. Of course, the design of the present study does not permit the examination of these specific questions. Nevertheless, in this sample, a uniquely predictive effect of worry or anxiety was identified for 3/20 participants, suggesting that the identification of this type of relationship is possible. In addition, previous research in this area has shown that it is possible to identify the predictive impact of a variable on another, even when the variables are closely-related; for example, intolerance of uncertainty and worry (Dugas

& Ladouceur, 2000). Therefore, the presence of a bi-directional relationship for the majority of participants in this study may be viewed with a certain level of confidence.

The Interacting Cognitive Subsystems (ICS) model described by Teasdale (1993), is based on the same principles as the interacting subsystems model and offers an interesting perspective on the findings of the present study. Teasdale's ICS model includes two levels of meaning: a propositional level, relating to specific concrete meanings, and a holistic level, relating to higher order, emotional knowledge. Teasdale argues that emotion only occurs at the holistic level, and only when certain patterns of stimuli are present at the propositional level (for example, the presence of a snake + autonomic arousal + perception of self as in danger). One implication of Teasdale's model is that meaningful therapeutic change only occurs at the holistic level, through the pattern of activation of propositional subsystems. Furthermore, it is assumed that change in any one system will lead to change in other systems. More specifically, however, Teasdale's model proposes that it would be possible to create change at the holistic level by targeting only one element of the system at the propositional level (i.e, physiological, behavioural, or cognitive). One can easily see how these ideas can be applied to the results of the current study. In addition, the prevalence of a bi-directional relationship among treatment responders in this study might even suggest that a mutual activation of two subsystems improves chances of treatment response. Once again, this proposal has a

certain face validity: one might expect treatment response to be reflected in change across a number of subsystems, rather than being restricted to a single system.

While the findings of this study create interesting possibilities for future research, the conclusions that can be drawn from it are somewhat limited. First, the worry and anxiety analyzed in this study were subjectively rated by participants during therapy. These measurements were limited because they were subjective self-reports, but also because they relied on each participant to differentiate between worry and anxiety when they made their ratings. An alternative explanation for the prevalence of bi-directional effects in this study may be that worry and anxiety were not sufficiently differentiated by participants when they made their ratings. If worry and anxiety were in fact treated as the same construct, it would not be surprising to find a bi-directional relationship between worry and anxiety in most datasets. In order to explore this possibility, correlations between daily ratings of worry and anxiety were calculated for individual participants. Analyses showed that all these correlations were significant and ranged from .45 to .95 ($\underline{M}$ = .84, $\underline{SD}$ = .11) . For 16/20 participants, this correlation did not exceed .90, indicating that for most participants, ratings of worry and anxiety were not multicollinear or singular; in other words, they appear to be measuring related but sufficiently distinct constructs (Tabachnick & Fidell, 1996, p. 84). Of the 4 participants for whom worry and anxiety were correlated at more than .90, 3 had a bi-directional

relationship, and 1 had no relationship. A point-biserial correlation showed that the degree of relationship between worry and anxiety was not related to the presence of a bi-directional relationship ($r(20) = .21$, $p = .37$). These rough estimates suggest that the bi-directional results found in this study are not due to an insufficient differentiation between worry and anxiety.

A further limitation of this study concerns the use of Time-Series Analysis. While this technique provides a unique opportunity to examine the impact of variables on each other over time, this method has certain drawbacks. First, Time-Series requires considerable variability in the data for the generation of adequate models (McLeary & Hay, 1980). While visual analysis of the data (Appendix 3) indicated adequate variability for all participants, there was a range of variability among participants which may have influenced the results. Second, Time-Series requires a large number of consecutive observations. While all participants analyzed in the present study had more than the minimum of 50 recommended observations (McLeary & Hay), some did not greatly exceed this number, which may again have affected the results. A related concern is that no predictive effects of either worry or anxiety were found for 3 participants in this study. Given the proposed connection between anxiety subsystems, this lack of a relationship is unexpected. A visual examination suggests that these participants have comparable data variability to the rest of the sample (see Appendix 3,

participants 2, 12, & 14); however, 2 of these 3 participants were also classified as treatment non-responders. It might be speculated that a lack of relationship between worry and anxiety reflects a lack of treatment response; however, this is conjectural and does not explain why the remaining participant, a treatment responder, also did not show a predictive impact of worry or anxiety. A final Time-Series caveat relates to the Granger (1969) and Weiner (1956) test for causality. While this technique provided information about the predictive relationships between worry and anxiety for most participants, it does not rule out the potential presence of a latent third variable that might better explain this relationship.

A final caution related to this study is that because of its primary focus on single-subject analyses, the sample size was small, with only 10 subjects per treatment group. It may be that group differences between CBT and AR exist, but that the sample size in this study was too small to detect these differences. Furthermore, it must be recalled that the relationship between treatment response and bi-directional causality was a non-significant trend. Therefore, the hypotheses generated by this study must be tested with a larger sample.

While it is interesting to speculate about the implications of these findings for models of anxiety, one conclusion can certainly be drawn from the present study: the importance and benefit of examining therapeutic change at the individual level. As

Hilliard (1993) points out, analysis of individual change is sadly lacking in the field of psychotherapy outcome research. In the current study, for example, an analysis of group differences might only have shown an equivalent treatment response to CBT and AR. However, this finding coupled with the prevalence of a bi-directional relationship between worry and anxiety sheds additional light on the processes that may explain this type of response to treatment; this information would not have been obtained if group differences alone had been examined. Future psychotherapy research may benefit from adding analyses at the individual level to comparisons of group differences, thereby providing valuable information about individual differences and the mechanisms of change for different treatments.

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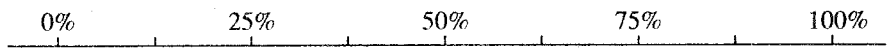
Appendix 1

Booklets used for self-monitoring of worry and anxiety

Code: _____ Thérapeute: _____

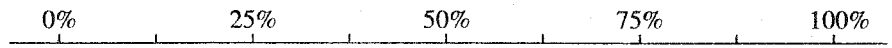
Semaine du _____ au _____

1. Quelle a été la proportion de la journée pendant laquelle vous avez été inquiet-ète aujourd'hui? (cote en %)



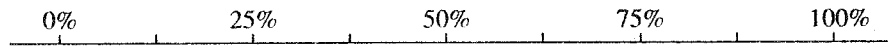
Date							
Jour							
Cote							

2. Quelle a été la proportion de la journée pendant laquelle vous avez été anxieux-se ou tendu-e aujourd'hui? (cote en %)



Date							
Jour							
Cote							

3. Quelle a été la proportion de la journée pendant laquelle vous avez été triste ou déprimé-e aujourd'hui? (cote en %)



Date							
Jour							
Cote							

4. Si vous avez pris des médicaments aujourd'hui, indiquez la sorte et la quantité totale pour la journée.

Date							
Jour							
Rx							
Quan -tité							

Appendix 2

Information guide and consent form

FORMULAIRE D'INFORMATION ET DE CONSENTEMENT

Titre de l'étude:	Le traitement psychologique du trouble d'anxiété généralisée: comparaison de la thérapie cognitive à la thérapie comportementale
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1. Nature et objectif de l'étude

   Dans le cadre de la présente étude, la thérapie cognitive sera comparée à la thérapie comportementale pour le traitement du trouble d'anxiété généralisée (TAG). Ces deux formes de traitement sont reconnues comme étant efficaces pour les gens souffrant du TAG. Le but principal de cette étude est de comparer l'efficacité à court et moyen terme de ces deux types de traitement. Le but secondaire de l'étude est d'identifier les facteurs prédictifs de l'efficacité des traitements et du maintien des progrès thérapeutiques.

   Un total de 102 adultes présentant un diagnostic primaire de TAG participeront à cette étude. Ils seront tous recrutés et traités à la Clinique des troubles anxieux de l'Hôpital du Sacré-Cœur de Montréal.

2. Déroulement de l'étude et méthodes utilisées

   Vous participerez d'abord à une entrevue diagnostique d'une heure avec un psychiatre. Cette entrevue préliminaire nous permettra d'évaluer si vous rencontrez les critères de sélection de l'étude. Si tel est le cas, vous participerez à une deuxième entrevue diagnostique avec un psychologue. Si la deuxième évaluation confirme que vous rencontrez les critères d'inclusion pour l'étude, vous serez alors invité(e) à y participer.

   Si vous acceptez de participer à l'étude, vous serez assigné(e) au hasard à l'une des trois conditions suivantes: (1) la thérapie cognitive, (2) la thérapie comportementale, ou (3) la liste d'attente. Les sujets dans la condition liste d'attente seront assignés au hasard à la thérapie cognitive ou à la thérapie comportementale après une période d'attente de 12 semaines. Tous les sujets recevront donc un traitement reconnu comme étant efficace pour le TAG. De plus, au cours des 12 semaines d'attente, les sujets sur la liste d'attente seront contactés à toutes les trois semaines pour vérifier si leur état nécessite une intervention plus urgente. Dans de telles circonstances, ils seront retirés de l'étude pour recevoir un traitement approprié.

   Les deux types de traitement seront administrés par des psychologues expérimentés. Ces traitements exigent des rencontres hebdomadaires de 60 minutes pendant douze semaines. Entre les rencontres, vous aurez des

lectures à faire et des exercices à pratiquer. Des rencontres de suivi 6 et 12 mois suite au traitement sont aussi prévues.

À différents moments de l'étude (avant le traitement, après le traitement, et aux rencontres de suivi de 6 et 12 mois), vous aurez à compléter certains questionnaires. Ceci est essentiel car vos réponses aux questionnaires nous permettront d'évaluer l'efficacité des traitements.

3. Risques, effets secondaires et désagréments

   Si vous recevez un médicament de votre médecin ou de votre psychiatre au moment du début de l'étude, cela demeure la responsabilité de ce dernier pendant la durée du traitement. Cependant, nous vous demandons seulement de ne pas augmenter le dosage de votre médication ou de modifier le type de médicament sans en avertir préalablement votre thérapeute.

   Il est possible que quelques uns des exercices prescrits par votre thérapeute provoquent certains malaises à court terme. Ceux-ci sont temporaires et disparaissent habituellement avec la pratique répétée de ces exercices.

4. Bénéfices et avantages

   Les deux types de traitement offerts sont efficaces pour le TAG. Ainsi, votre participation à cette étude devrait vous aider à diminuer significativement votre anxiété et vous aider à retrouver un meilleur fonctionnement personnel, social et/ou professionnel. Parallèlement, vous allez nous aider à mieux évaluer l'efficacité de ces traitements et ainsi contribuer à l'avancement des connaissances en participant à cette étude. Compte tenu qu'il existe différents traitements reconnus comme efficaces pour le TAG, il est actuellement crucial de comparer l'efficacité de ceux-ci afin d'identifier la psychothérapie de choix.

5. Autres moyens thérapeutiques possibles

   Si vous décidez de ne pas participer à cette étude, d'autres formes de traitement sont disponibles pour le TAG. Ceux-ci comprennent la psychothérapie, la pharmacothérapie (traitement médicamenteux) ou une combinaison de psychothérapie et de médicament.

6. Versement d'une indemnité

   Les sujets ne recevront aucune rémunération relative à leur participation à cette étude.

7. Confidentialité

   Les rencontres de traitement seront enregistrées sur bande audio. Une seule assistante de recherche expérimentée écoutera l'enregistrement des rencontres afin de s'assurer de la qualité des interventions que vous aurez reçues. Tout comme les questionnaires que vous compléterez au cours de cette étude, les cassettes ne seront identifiées que par un numéro de code.

   Tous les renseignements recueillis à votre sujet au cours de l'étude, incluant les bandes audio, demeureront strictement confidentiels, dans les limites prévues par la loi, et vous ne serez identifié(e) que par un code afin de préserver l'anonymat. Aucune publication ou communication scientifique résultant de cette étude ne renfermera quoi que ce soit qui puisse permettre de vous identifier. Lorsque cette étude sera terminée, les questionnaires seront détruits et les bandes audio seront effacées.

   Cependant, à des fins de contrôle du projet de recherche, votre dossier pourra être consulté par une personne mandatée par le comité d'éthique de la recherche de l'hôpital ainsi que par des représentants de l'organisme subventionnel (Instituts de recherche en santé du Canada) et des organismes gouvernementaux de santé autorisés. Tous ces organismes adhèrent à une politique de stricte confidentialité.

8. Indemnisation en cas de préjudice

   Si vous deviez subir quelque préjudice que ce soit par suite de l'administration des traitements à l'étude, vous recevrez tous les soins médicaux nécessaires, sans frais de votre part.

   En acceptant de participer à cette étude, vous ne renoncez à aucun de vos droits ni ne libérez les chercheurs ou les institutions impliqués de leurs responsabilités légales et professionnelles.

9. Participation volontaire et retrait de l'étude

Votre participation à cette étude est volontaire. Vous êtes donc tout à fait libre de refuser d'y participer. Vous pouvez également vous retirer de l'étude à n'importe quel moment sans avoir à vous justifier, en faisant connaître votre décision au chercheur ou à l'un(e) de ses assistant(e)s. Toute nouvelle connaissance acquise durant le déroulement de l'étude qui pourrait affecter votre décision de continuer d'y participer vous sera communiquée sans délai.

Votre décision de ne pas participer à l'étude ou de vous en retirer n'aura aucune conséquence sur les soins qui vous seront fournis par la suite ou sur vos relations avec votre médecin et les autres intervenants.

Le chercheur responsable de l'étude peut aussi décider de vous retirer de l'étude sans votre consentement si vous débutez une médication qui n'est pas autorisée par l'étude, si votre participation au traitement n'est pas assidue ou que votre état psychologique se détériore. Si vous le désirez, ou si on vous recommande, vous pouvez obtenir un suivi approprié à la clinique.

10. Personnes à contacter

Si vous avez des questions au sujet de cette étude, s'il survient un incident quelconque ou si vous désirez vous retirer de l'étude, vous pouvez contacter en tout temps le chercheur ou un cochercheur de cette étude à Clinique des troubles anxieux au (514) 338-4201 (selon les heures de bureau).

Si vous avez des questions concernant vos droits en tant que participant à un projet de recherche, ou si vous avez des plaintes ou des commentaires à formuler, vous pouvez communiquer avec Huguette Gervais, à la Direction Générale, au (514) 338-2222, poste 2730.

CONSENTEMENT

La nature de cette étude, les procédures utilisées, les risques et les bénéfices que comporte ma participation à cette étude ainsi que les aspects relatifs à la confidentialité des informations qui seront recueillies au cours de l'étude m'ont été expliqués.

J'ai eu l'occasion de poser toutes les questions concernant les différents aspects de cette étude et on y a répondu de façon satisfaisante.

Je reconnais qu'on m'a laissé le temps voulu pour prendre ma décision.

J'accepte volontairement de participer à cette étude. Je demeure libre de m'en retirer en tout temps sans que cela ne nuise aux relations avec mon médecin ou les autres intervenants et sans préjudice d'aucune sorte.

Je recevrai une copie signée de ce formulaire d'information et de consentement.

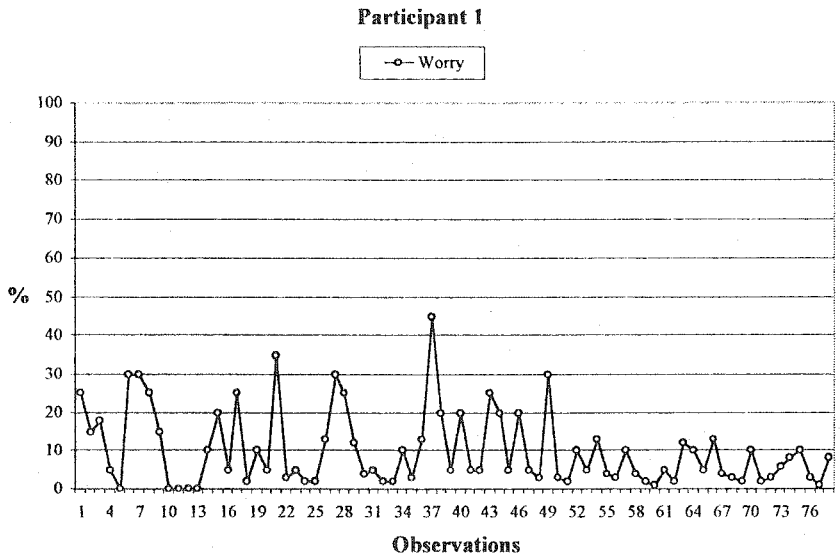
Nom du sujet	Signature	Date
Nom du chercheur	Signature	Date
Nom du témoin	Signature	Date

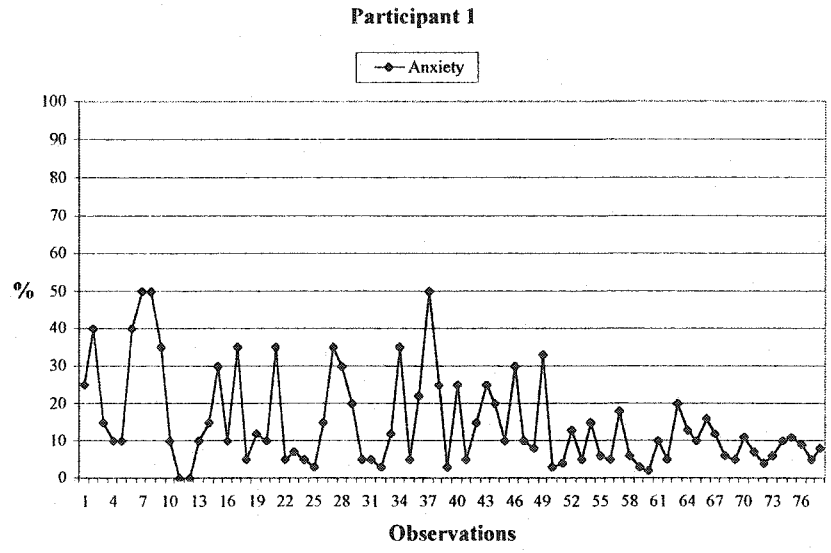
Appendix 3

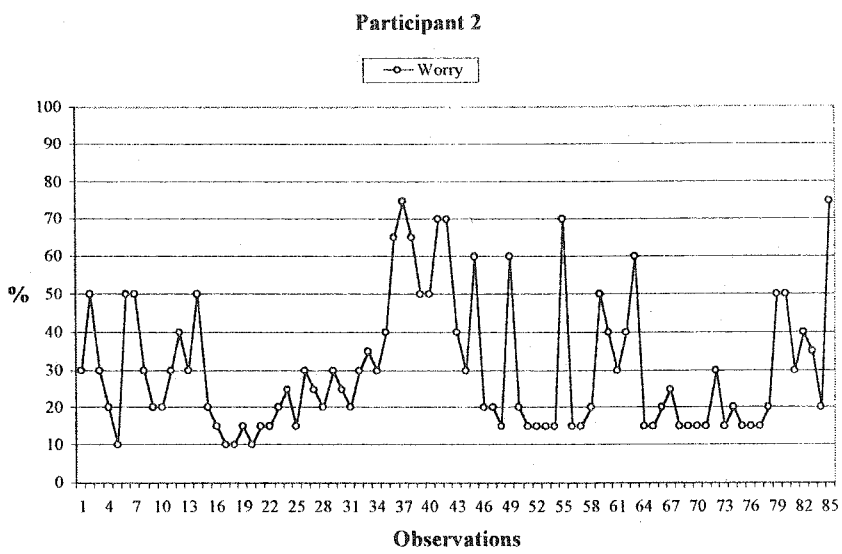
Graphed representation of worry and anxiety for each participant

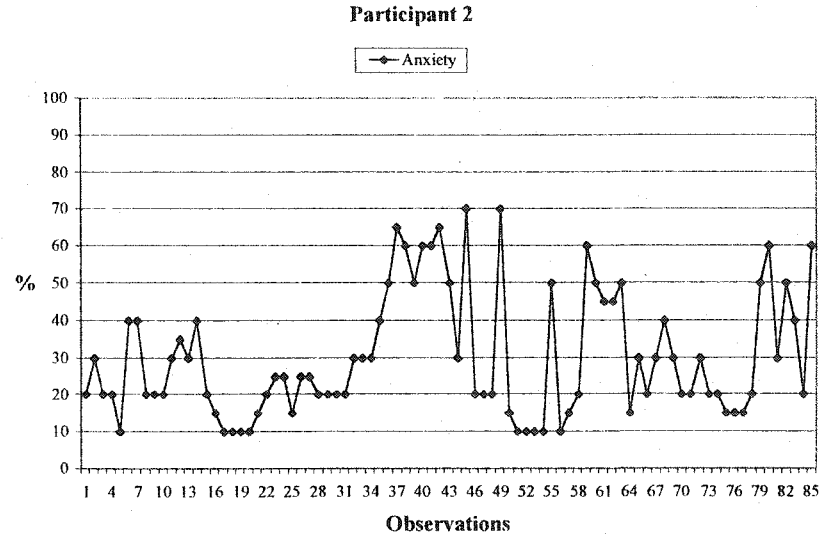
Figure 1.

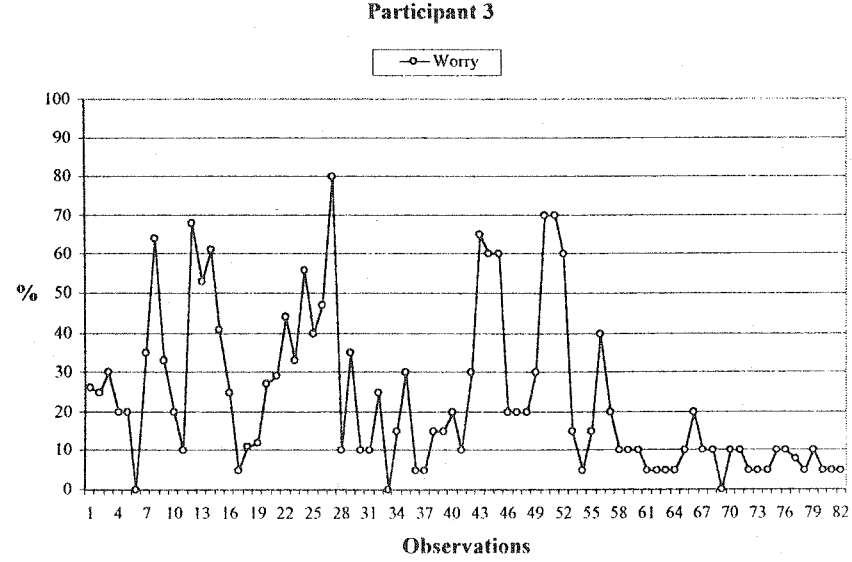
Graphed Representation of Worry and Anxiety Time Series for Each Participant.

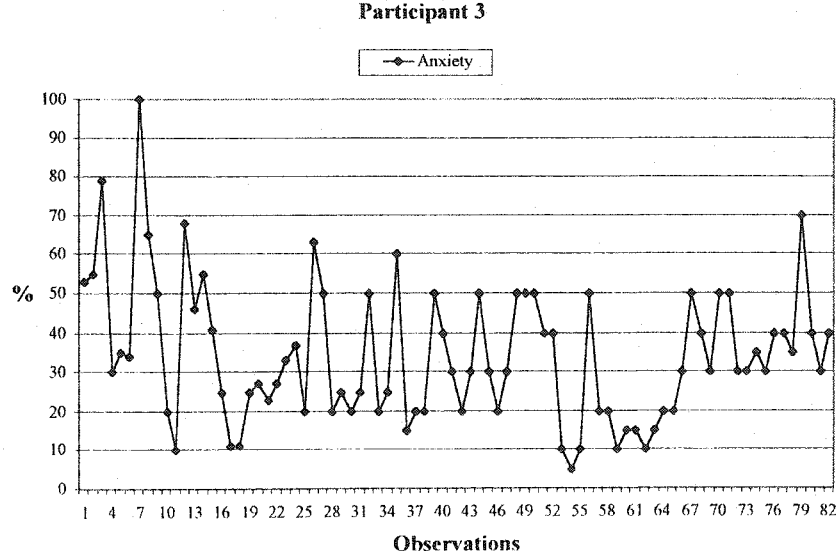




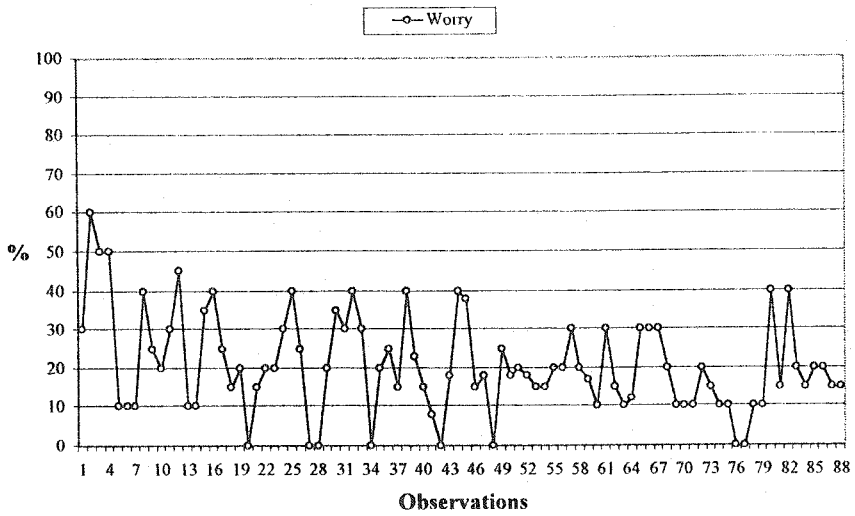

Participant 2
Worry
%
Observations


Participant 2
Anxiety
%
Observations

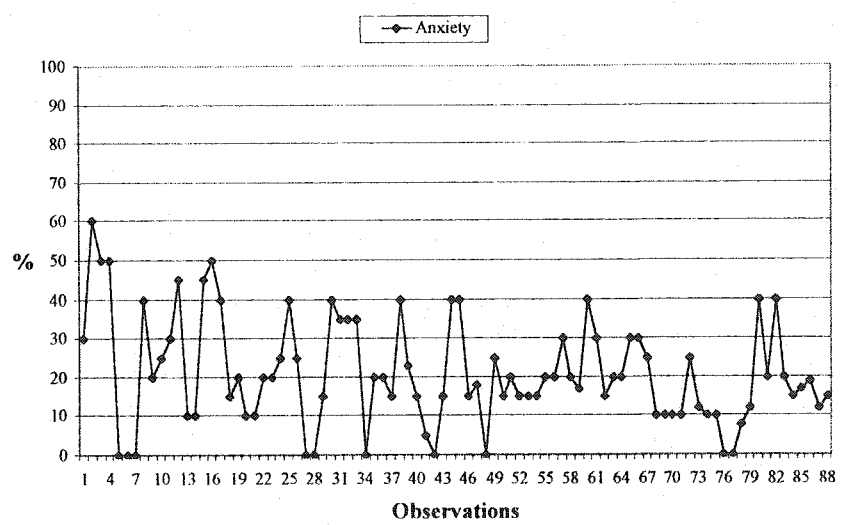

Participant 3
Worry
%
Observations


Participant 3
Anxiety
%
Observations

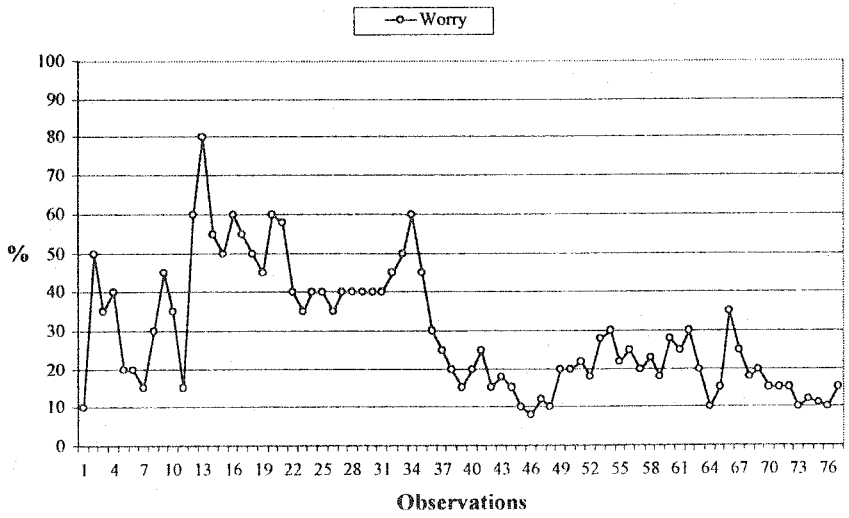
Participant 4



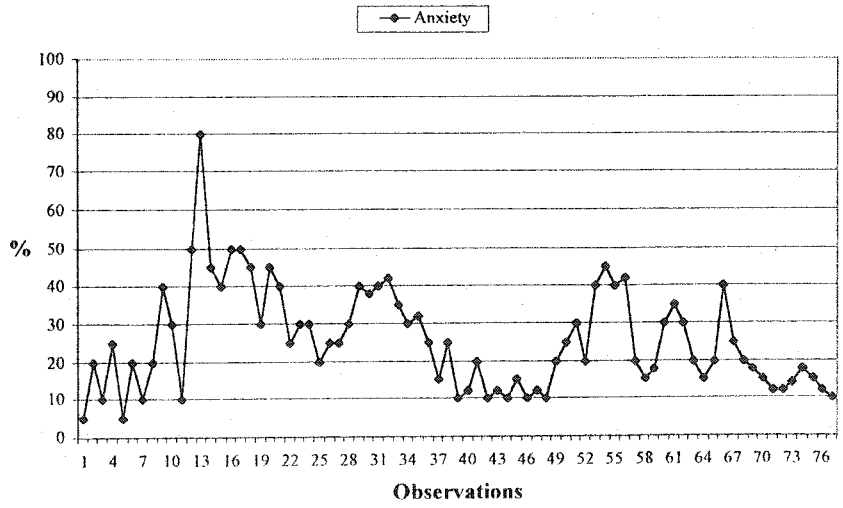
Participant 4

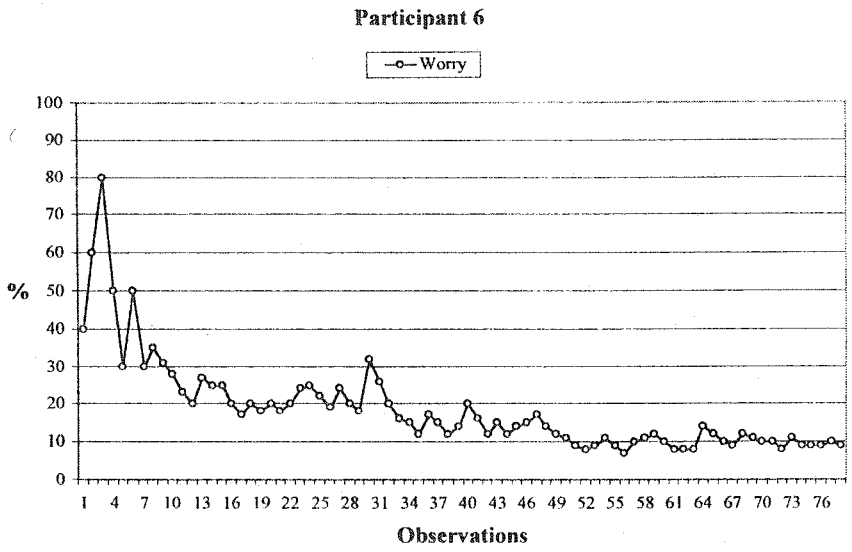


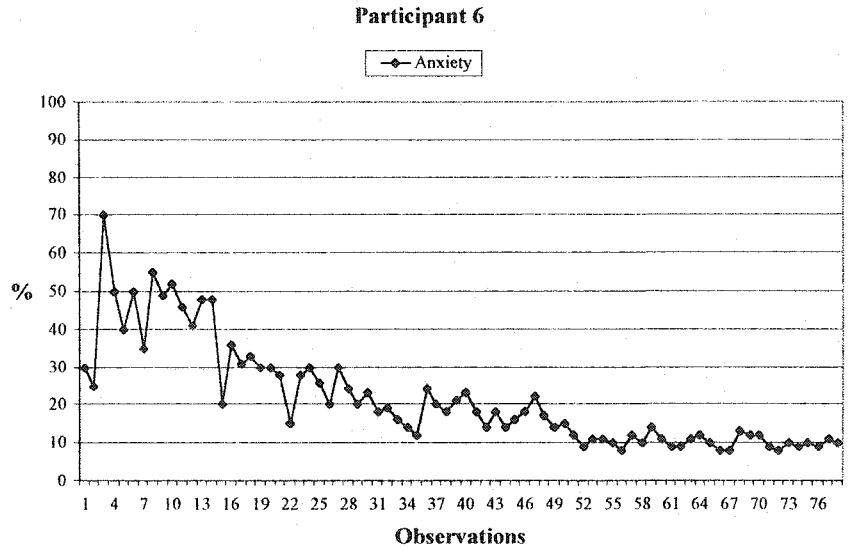
Participant 5

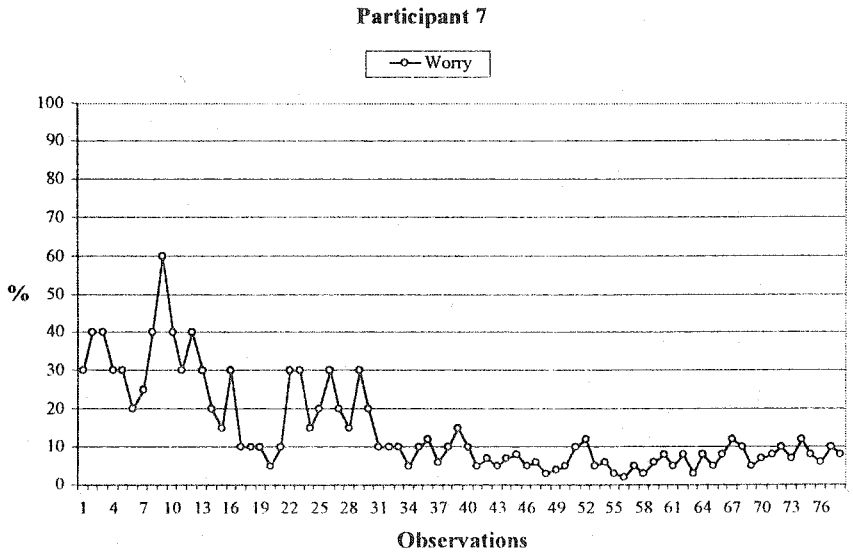


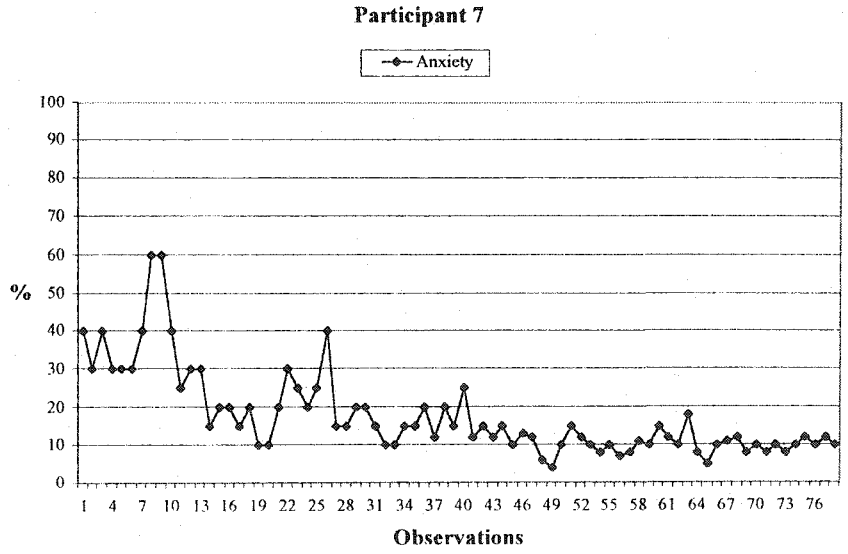
Participant 5

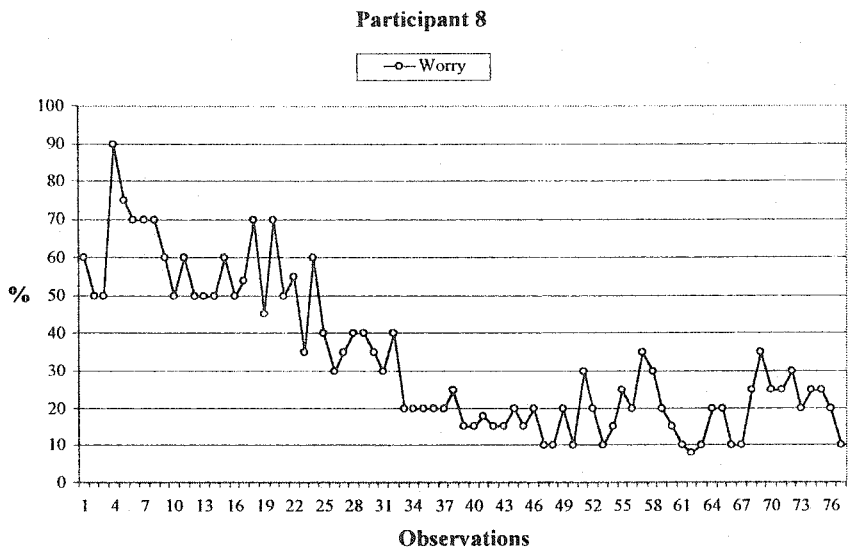


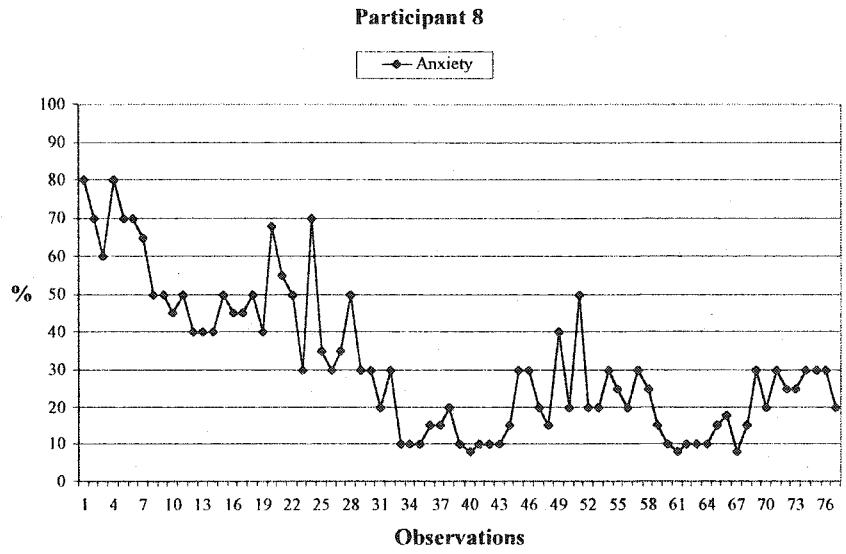

Participant 6
Worry
%
Observations

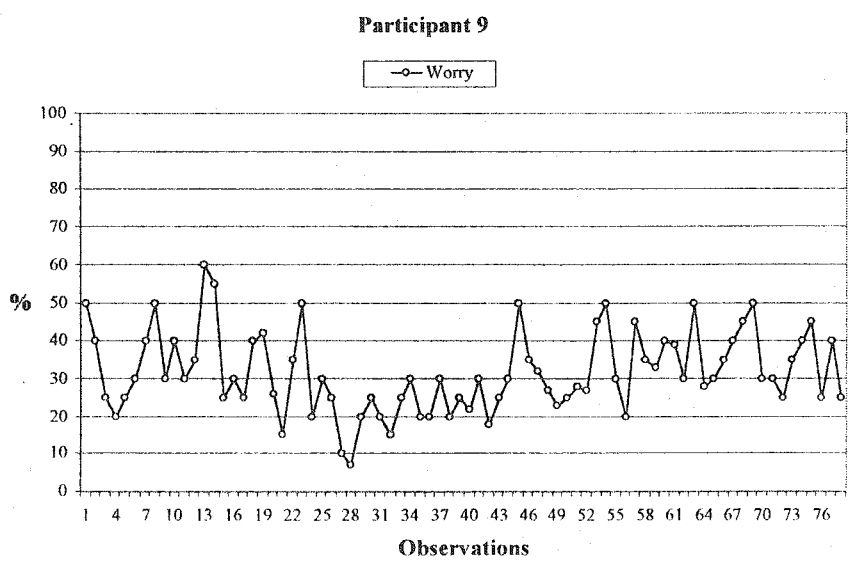

Participant 6
Anxiety
%
Observations

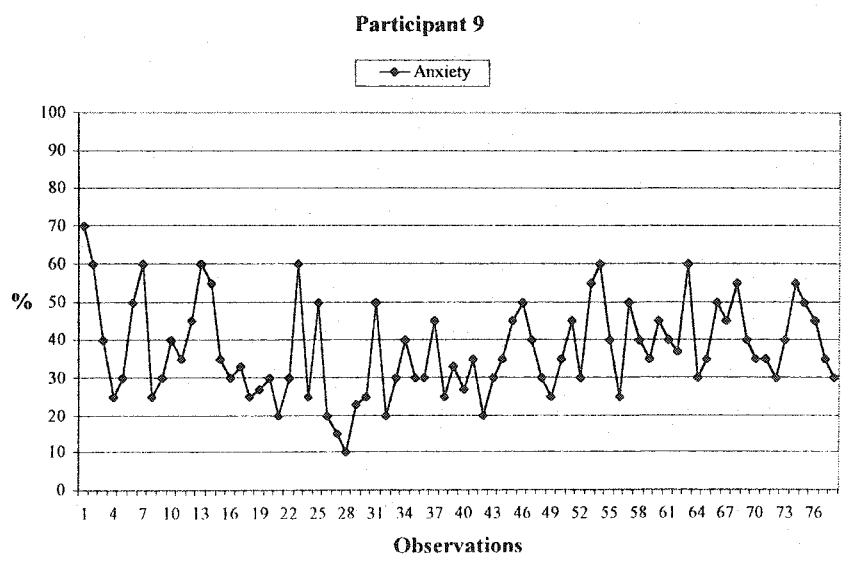

Participant 7
Worry
%
Observations

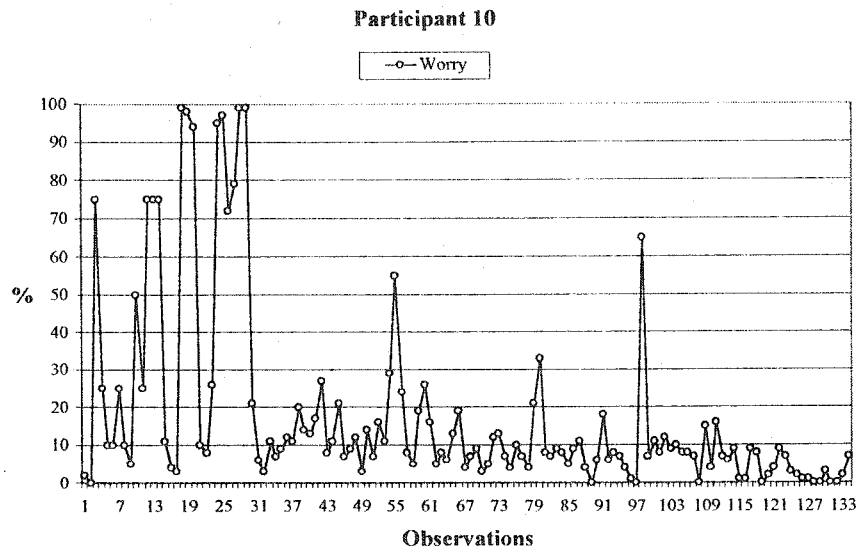

Participant 7
Anxiety
%
Observations

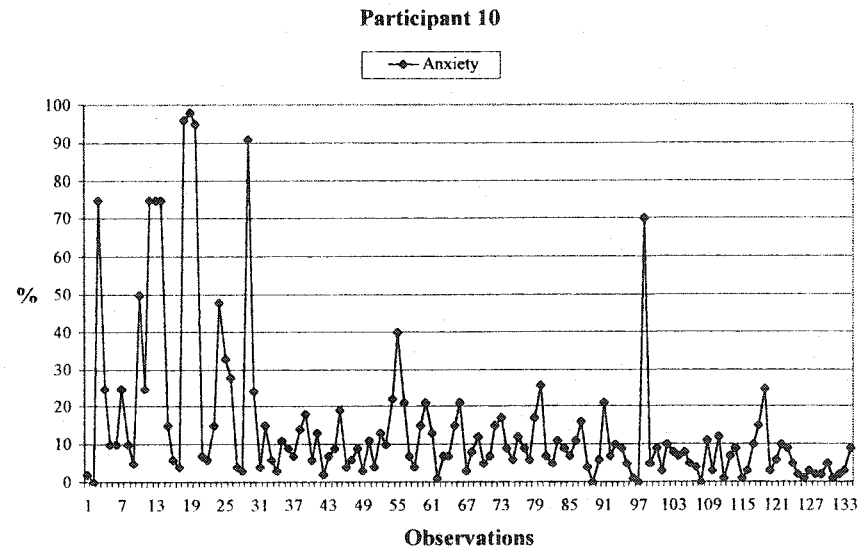

Participant 8
Worry
%
Observations

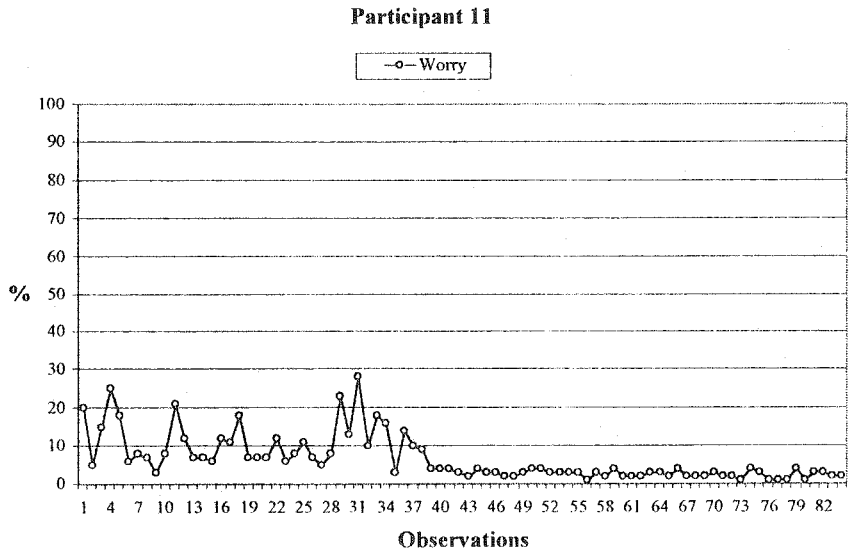

Participant 8
Anxiety
%
Observations

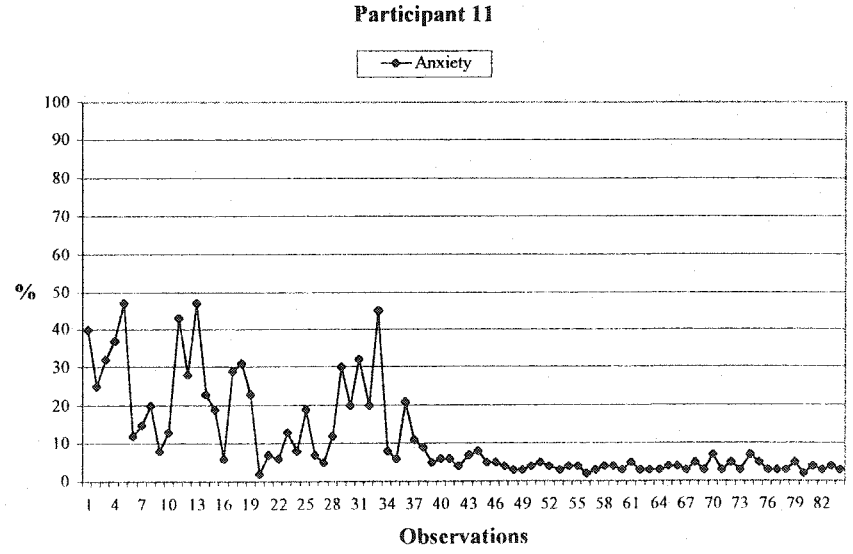

Participant 9
Worry
%
Observations

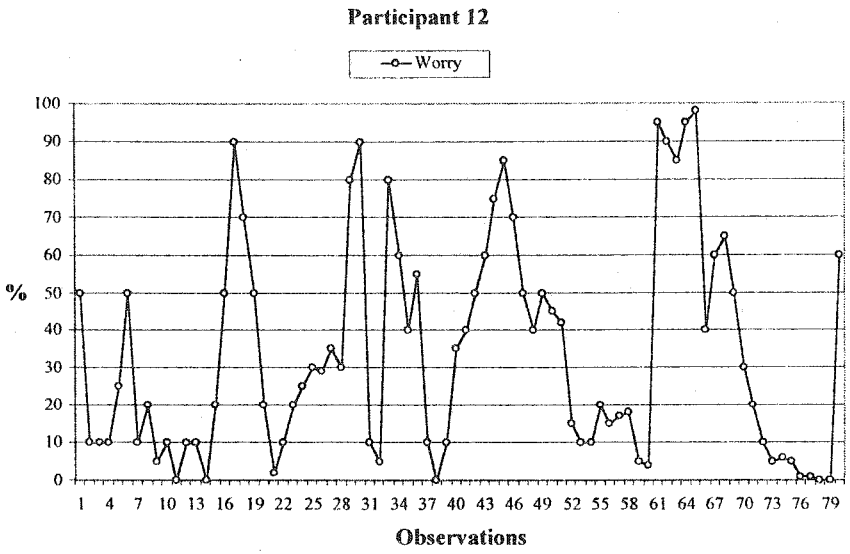

Participant 9
Anxiety
%
Observations

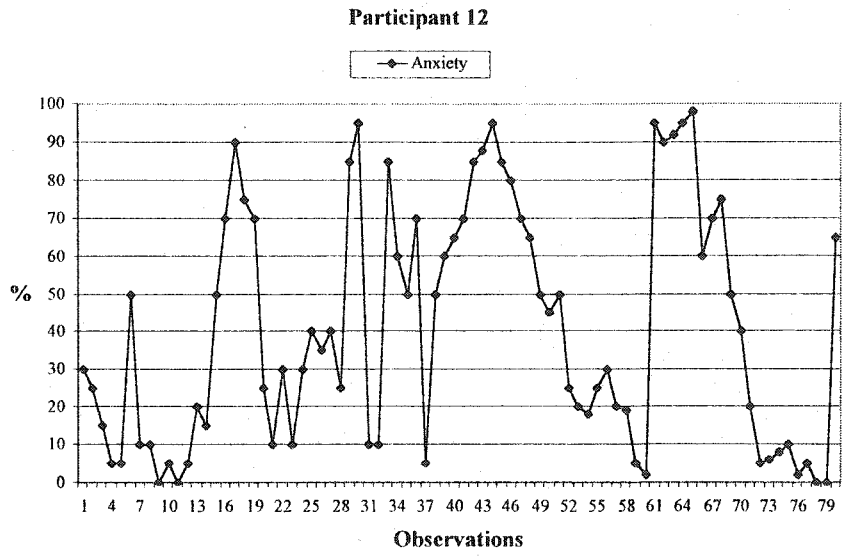

Participant 10
Worry
%
Observations

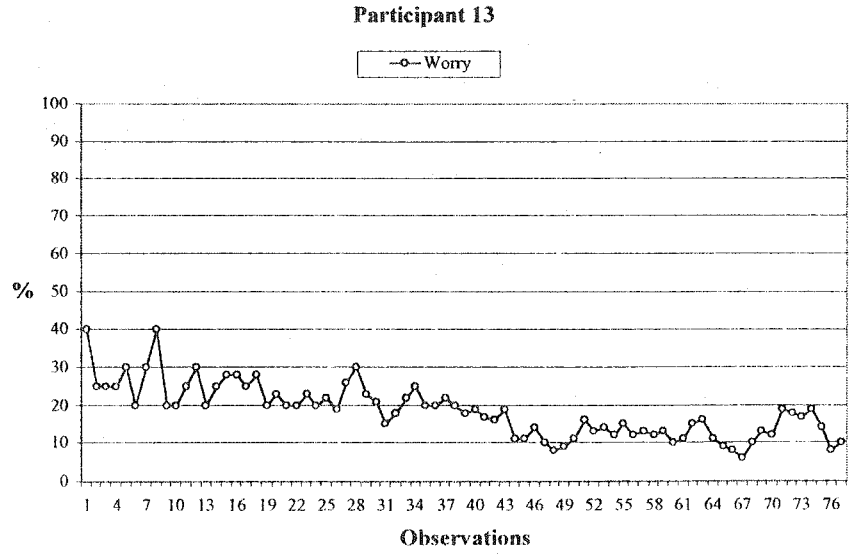

Participant 10
Anxiety
%
Observations

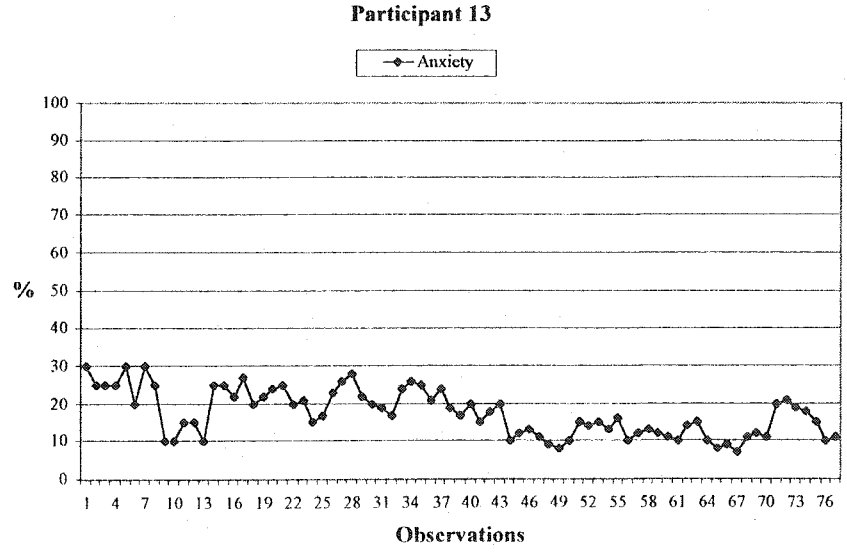

Participant 11
Worry
%
Observations

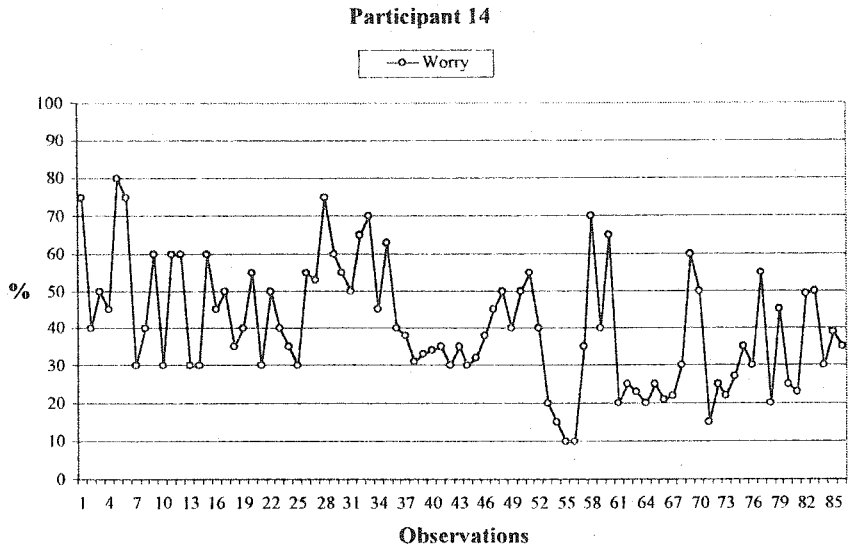

Participant 11
Anxiety
%
Observations

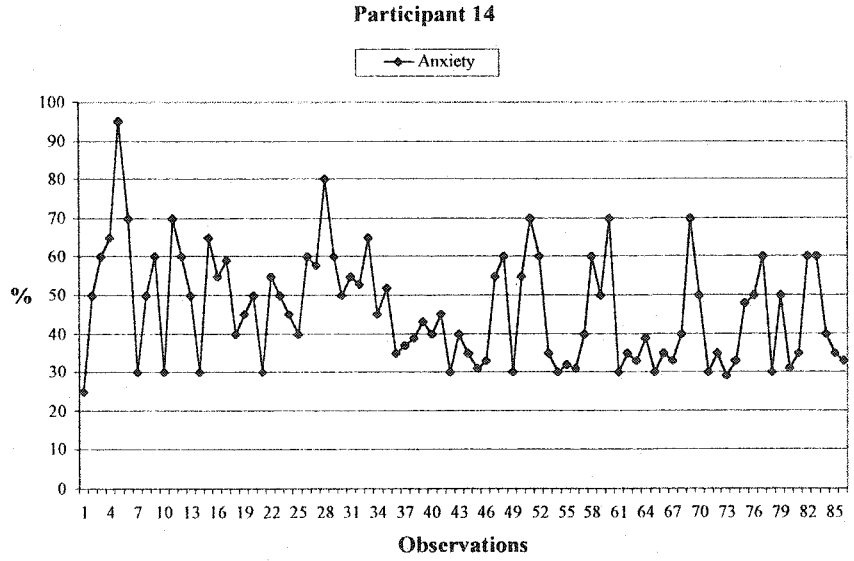

Participant 12
Worry
%
Observations

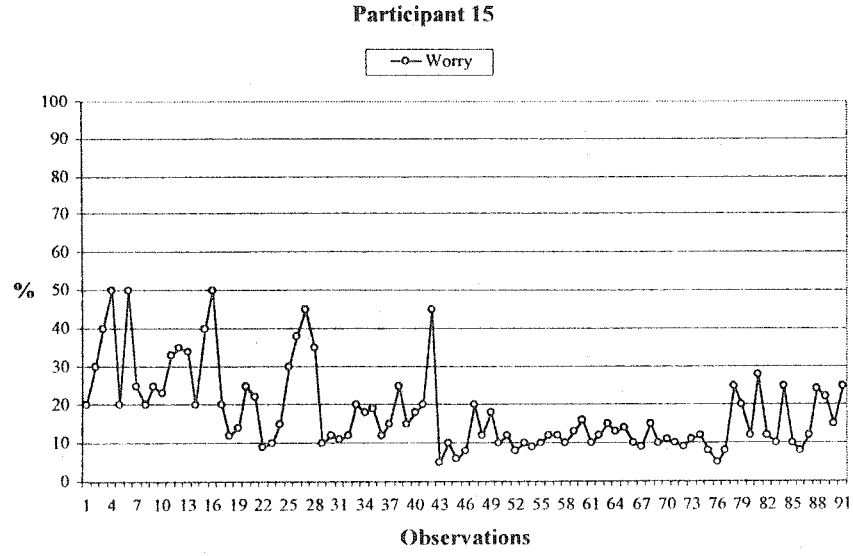

Participant 12
Anxiety
%
Observations

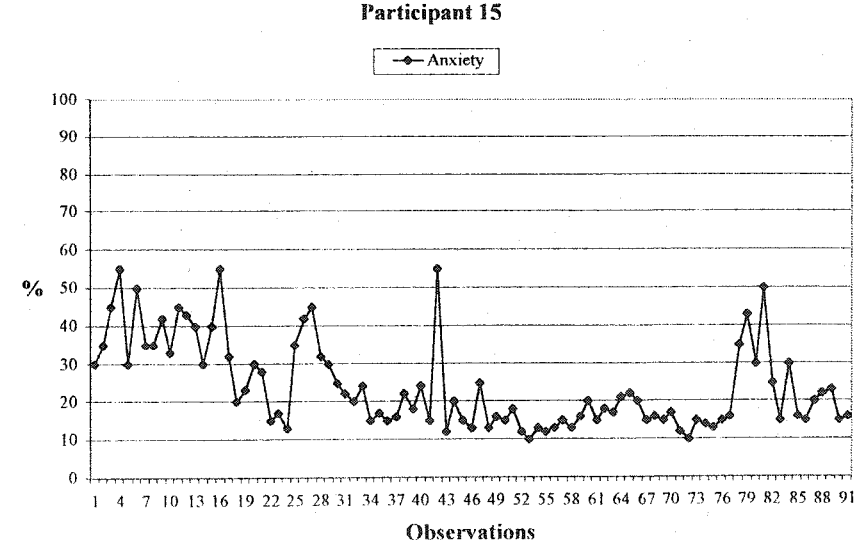

Participant 13
Worry
%
Observations

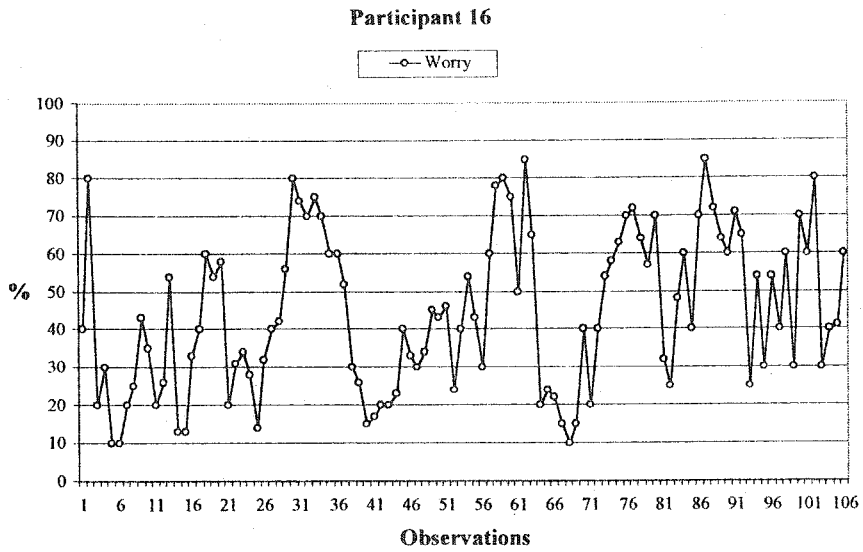

Participant 13
Anxiety
%
Observations

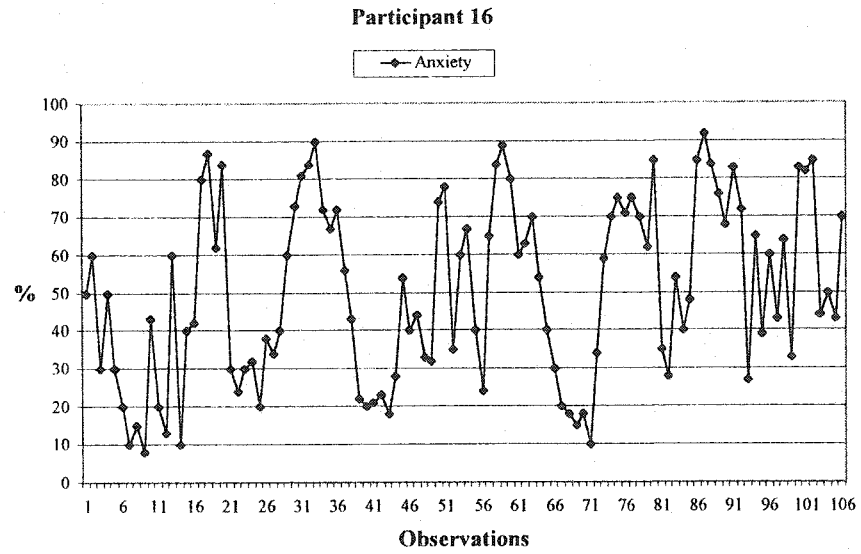

Participant 14
Worry
%
Observations

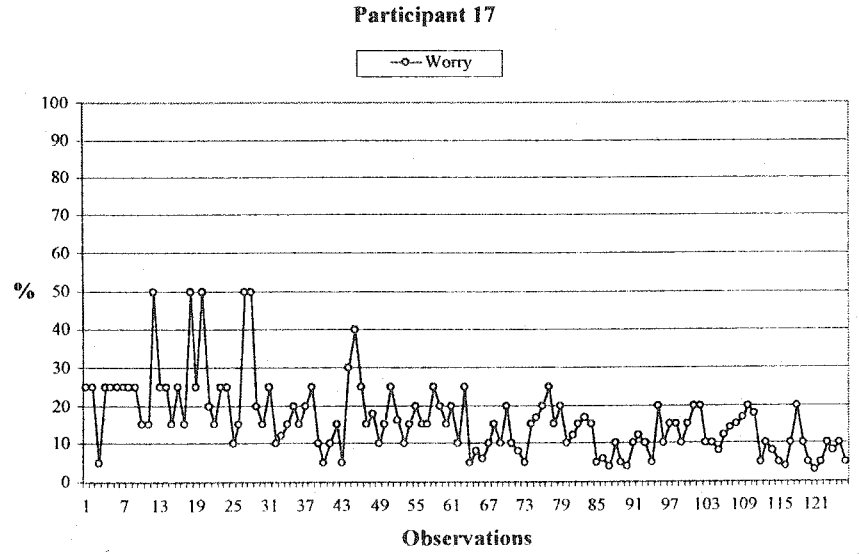

Participant 14
Anxiety
%
Observations

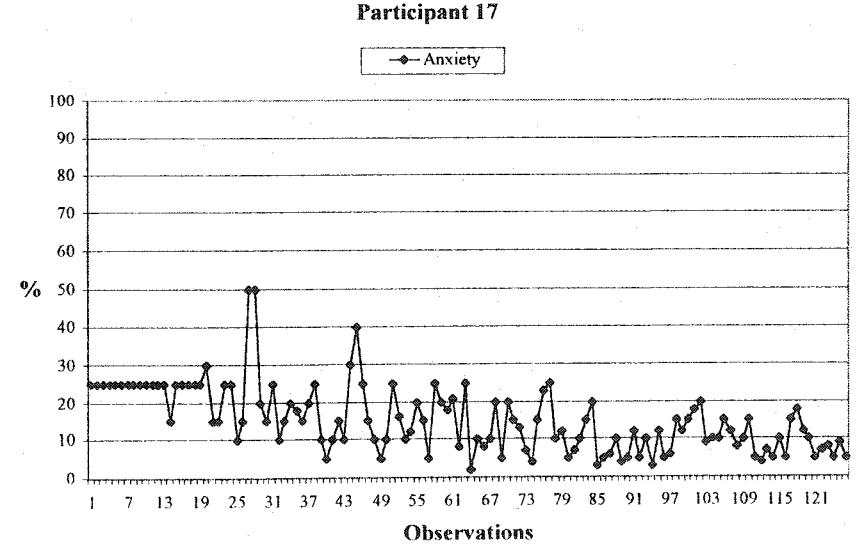

Participant 15
Worry
%
Observations

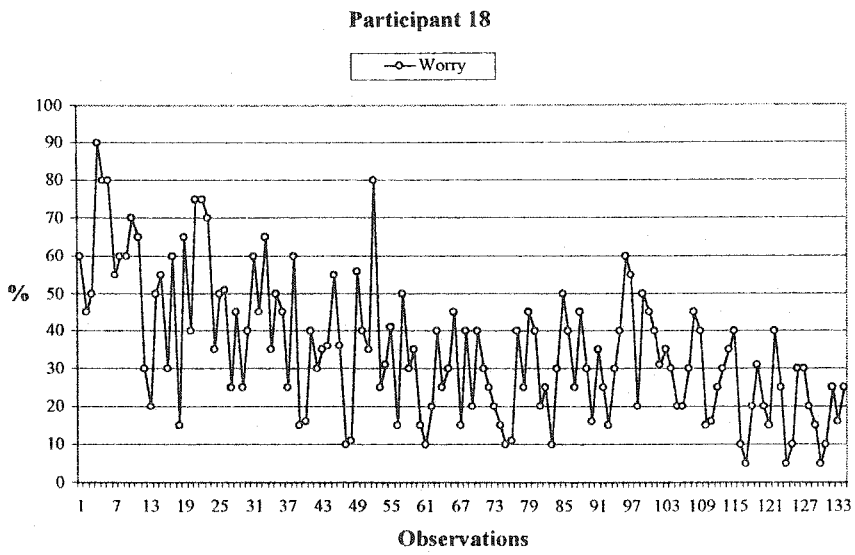

Participant 15
Anxiety
%
Observations

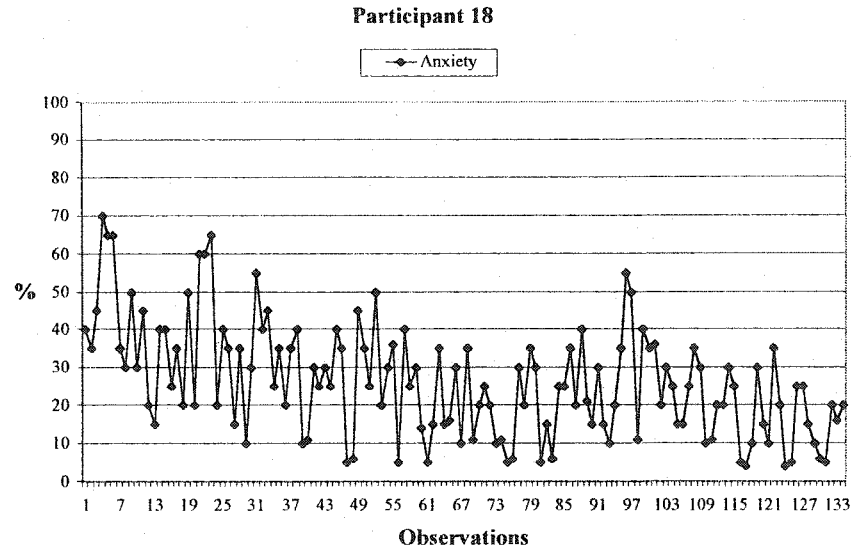

Participant 16
Worry
%
Observations

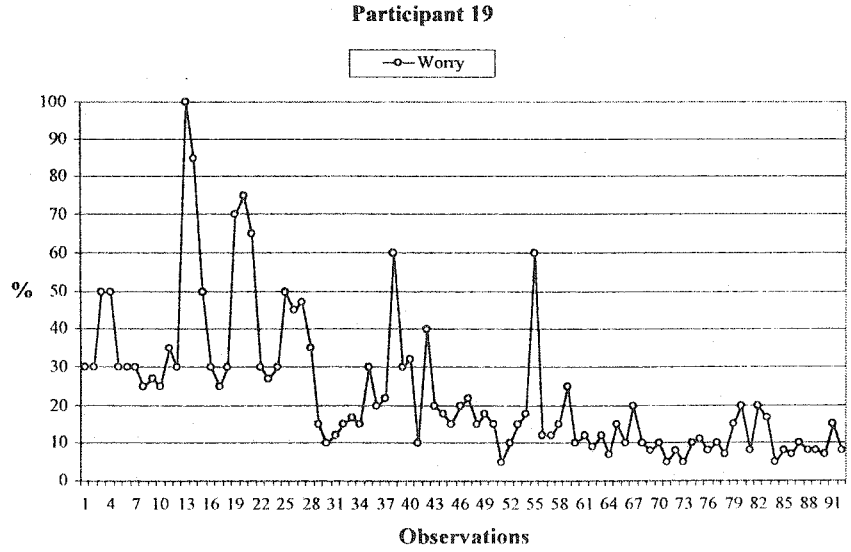

Participant 16
Anxiety
%
Observations

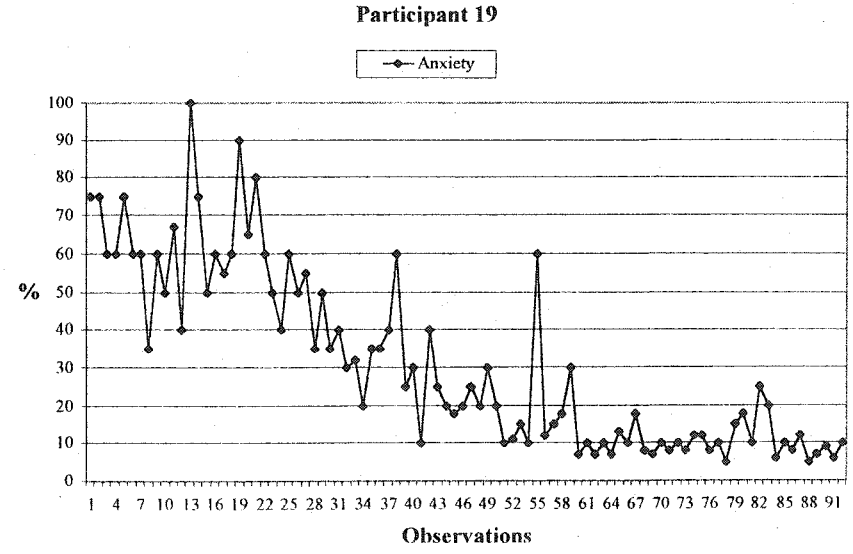

Participant 17
Worry
%
Observations

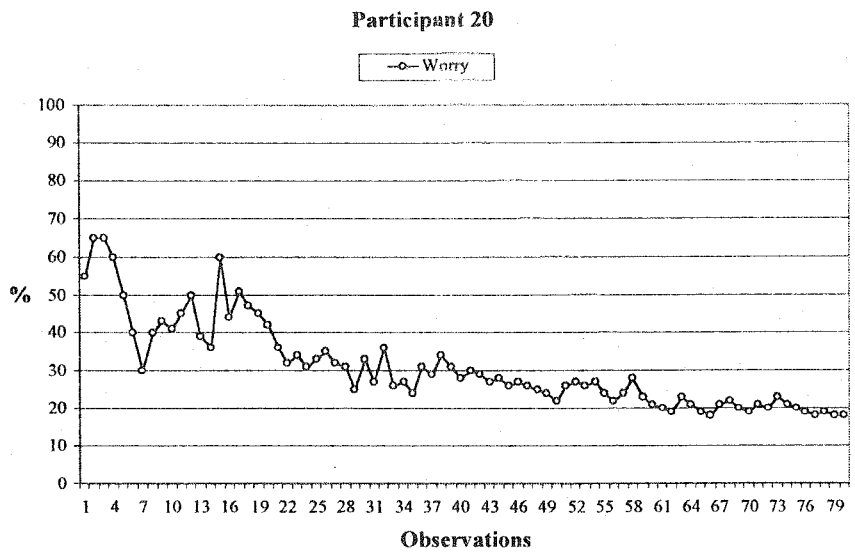

Participant 17
Anxiety
%
Observations

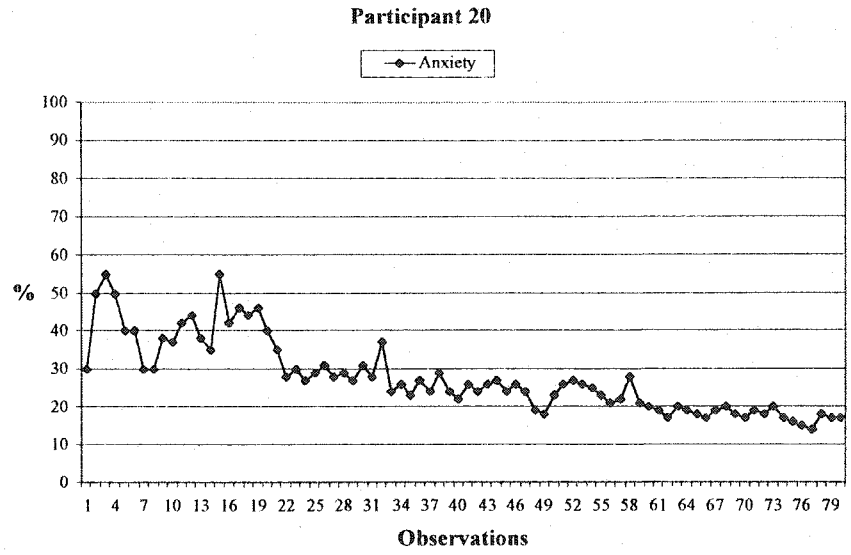

Participant 18
Worry
%
Observations


Participant 18
Anxiety
%
Observations


Participant 19
Worry
%
Observations


Participant 19
Anxiety
%
Observations


Participant 20
Worry
100
90
80
70
60
50
40
30
20
10
0
%
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79
Observations


Participant 20
Anxiety
100
90
80
70
60
50
40
30
20
10
0
%
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79
Observations

Appendix 4

ARMA Formulas for Each Participant

Figure 2.

ARMA Formulas for Each Participant, where "Worry" Represents the Series of Worry Observations and "Anxiety" Represents the Series of Anxiety Observations.

Participant 1

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.740 & .437\\ (.216) & (.173)\\ -.949 & .519\\ (.259) & (.210)\end{bmatrix} B^4\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}10.987\\ (1.986)\\ 16.803\\ (2.540)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.193 & 0\\ (.078) & (.)\\ 0 & -.305\\ (.) & (.076)\end{bmatrix} B - \begin{bmatrix}-.820 & .501\\ (.231) & (.191)\\ -.763 & .288\\ (.269) & (.222)\end{bmatrix} B^6\right\}$$

$$+\begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 2

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.565 & -.170\\ (.154) & (.100)\\ .474 & 0\\ (.110) & (.)\end{bmatrix} B^4\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}19.546\\ (4.628)\\ 20.157\\ (4.638)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.761 & .075\\ (.072) & (.097)\\ -.322 & -.296\\ (.112) & (.133)\end{bmatrix} B - \begin{bmatrix}-.691 & .263\\ (.076) & (.085)\\ -.573 & 0\\ (.075) & (.)\end{bmatrix} B^8\right\}$$

$$+\begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 3

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.790 & -.010\\ (.112) & (.087)\\ -.278 & .829\\ (.124) & (.104)\end{bmatrix} B\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}5.201\\ (3.832)\\ 12.141\\ (4.486)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.137 & 0\\ (.114) & (.)\\ -.574 & .800\\ (.156) & (.110)\end{bmatrix} B - \begin{bmatrix}.394 & .093\\ (.108) & (.110)\\ .145 & .215\\ (.120) & (.122)\end{bmatrix} B^3 -$$

$$\left\{\begin{bmatrix} -.328 & -.195 \\ (.095) & (.100) \\ -.389 & -.119 \\ (.109) & (.129) \end{bmatrix} B^{5}\right\} + \begin{bmatrix} Worry_{at} \\ Anxiety_{at} \end{bmatrix}$$

Participant 4

$$\left\{\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .345 & 0 \\ (.098) & (.) \\ .367 & 0 \\ (.107) & (.) \end{bmatrix} B\right\} \begin{bmatrix} Worry_{t} \\ Anxiety_{t} \end{bmatrix} = \begin{bmatrix} 13.399 \\ (2.377) \\ 13.172 \\ (2.536) \end{bmatrix} + \left\{\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} -.218 & .446 \\ (.104) & (.121) \\ 0 & .280 \\ (.) & (.096) \end{bmatrix} B^{3} - \begin{bmatrix} -.301 & 0 \\ (.099) & (.) \\ -.327 & 0 \\ (.108) & (.) \end{bmatrix} B^{14}\right\}$$

$$+ \begin{bmatrix} Worry_{at} \\ Anxiety_{at} \end{bmatrix}$$

Participant 5

$$\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .643 & 0 \\ (.059) & (.) \\ 0 & .602 \\ (.) & (.064) \end{bmatrix} B - \begin{bmatrix} 0 & .224 \\ (.) & (.090) \\ -.190 & .321 \\ (.061) & (.115) \end{bmatrix} B^3 \right\} \begin{bmatrix} Worry_t \\ Anxiety_t \end{bmatrix} = \begin{bmatrix} 4.452 \\ (2.802) \\ 7.796 \\ (2.817) \end{bmatrix} + \left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} -.273 & 0 \\ (.114) & (.) \\ -1.024 & .812 \\ (.129) & (.073) \end{bmatrix} B^4 \right\}$$

$$+ \begin{bmatrix} Worry_{at} \\ Anxiety_{at} \end{bmatrix}$$

Participant 6

$$\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .593 & .048 \\ (.092) & (.070) \\ .102 & .091 \\ (.097) & (.089) \end{bmatrix} B - \begin{bmatrix} .183 & -.054 \\ (.079) & (.067) \\ .225 & -.182 \\ (.090) & (.077) \end{bmatrix} B^5 - \begin{bmatrix} 0 & -.116 \\ (.) & (.058) \\ .092 & .230 \\ (.069) & (.072) \end{bmatrix} B^8 - \begin{bmatrix} 0 & .169 \\ (.) & (.041) \\ .298 & .091 \\ (.054) & (.055) \end{bmatrix} B^{10} \right\} \begin{bmatrix} Worry_t \\ Anxiety_t \end{bmatrix} =$$

$$\begin{pmatrix} 1.753 \\ (0.937) \\ \\ -0.042 \\ (0.849) \end{pmatrix} + \left\{ \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} - \begin{pmatrix} -.100 & .203 \\ (.119) & (.122) \\ 0 & .539 \\ (.) & (.109) \end{pmatrix} B^{8} \right\} + \begin{pmatrix} Worry_{at} \\ Anxiety_{at} \end{pmatrix}$$

Participant 7

$$\left\{ \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} - \begin{pmatrix} .479 & .204 \\ (.115) & (.109) \\ .399 & 0 \\ (.095) & (.) \end{pmatrix} B - \begin{pmatrix} -.209 & .392 \\ (.102) & (.095) \\ -.248 & .322 \\ (.110) & (.104) \end{pmatrix} B^{4} - \begin{pmatrix} .473 & -.446 \\ (.104) & (.105) \\ .238 & -.323 \\ (.113) & (.114) \end{pmatrix} B^{6} - \begin{pmatrix} -.443 & .312 \\ (.106) & (.109) \\ -.228 & .221 \\ (.115) & (.119) \end{pmatrix} B^{8} - \begin{pmatrix} .399 & -.321 \\ (.091) & (.099) \\ .377 & -.220 \\ (.097) & (.109) \end{pmatrix} B^{10} \right\}$$

$$\begin{pmatrix} Worry_{t} \\ Anxiety_{t} \end{pmatrix} = \begin{pmatrix} 0.831 \\ (1.412) \\ 7.591 \\ (1.347) \end{pmatrix} + \begin{pmatrix} Worry_{at} \\ Anxiety_{at} \end{pmatrix}$$

Participant 8

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.811 & .195\\ (.064) & (.076)\\ 0 & .929\\ (.) & (.026)\end{bmatrix} B\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}-0.425\\ (0.736)\\ 1.528\\ (0.891)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.569 & .233\\ (.122) & (.137)\\ 0 & .663\\ (.) & (.080)\end{bmatrix} B\right\} + \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 9

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}0 & .043\\ (.) & (.097)\\ 0 & .097\\ (.) & (.110)\end{bmatrix} B^2 - \begin{bmatrix}.397 & -.213\\ (.160) & (.141)\\ .248 & -.251\\ (.182) & (.160)\end{bmatrix} B^4 - \begin{bmatrix}.202 & .150\\ (.152) & (.140)\\ .080 & .194\\ (.172) & (.159)\end{bmatrix} B^6 - \begin{bmatrix}-.219 & .300\\ (.157) & (.134)\\ -.385 & .400\\ (.178) & (.152)\end{bmatrix} B^8\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} =$$

$$\begin{bmatrix} 9.089 \\ (6.339) \\ \\ 22.244 \\ (7.184) \end{bmatrix} + \begin{bmatrix} Worry_{at} \\ \\ Anxiety_{at} \end{bmatrix}$$

Participant 10

$$\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} 1.058 & -.658 \\ (.078) & (.072) \\ .308 & 0 \\ (.064) & (.) \end{bmatrix} B - \begin{bmatrix} -.192 & .471 \\ (.051) & (.081) \\ 0 & .190 \\ (.) & (.070) \end{bmatrix} B^4 - \begin{bmatrix} 0 & .332 \\ (.) & (.068) \\ 0 & .290 \\ (.) & (.069) \end{bmatrix} B^6 \right\} \begin{bmatrix} Worry_t \\ \\ Anxiety_t \end{bmatrix} = \begin{bmatrix} -0.248 \\ (1.206) \\ \\ 1.798 \\ (1.929) \end{bmatrix} +$$

$$\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .362 & -.429 \\ (.090) & (.102) \\ 0 & -.265 \\ (.) & (.078) \end{bmatrix} B^2 - \begin{bmatrix} .490 & 0 \\ (.077) & (.) \\ .438 & 0 \\ (.082) & (.) \end{bmatrix} B^3 \right\} + \begin{bmatrix} Worry_{at} \\ \\ Anxiety_{at} \end{bmatrix}$$

Participant 11

$$\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .172 & .252 \\ (.102) & (.068) \\ 0 & .420 \\ (.) & (.083) \end{bmatrix} B - \begin{bmatrix} .574 & -.294 \\ (.124) & (.072) \\ 1.178 & -.049 \\ (.188) & (.104) \end{bmatrix} B^2 - \begin{bmatrix} -.369 & .179 \\ (.140) & (.068) \\ -.718 & .216 \\ (.215) & (.101) \end{bmatrix} B^3 - \begin{bmatrix} .129 & .073 \\ (.146) & (.067) \\ -.778 & .549 \\ (.209) & (.100) \end{bmatrix} B^4 - \begin{bmatrix} 0 & -.120 \\ (.) & (.053) \\ -.595 & -.166 \\ (.171) & (.098) \end{bmatrix} B^5 - \begin{bmatrix} 0 & .131 \\ (.) & (.056) \\ 0 & .136 \\ (.) & (.078) \end{bmatrix} B^6 - \begin{bmatrix} .495 & -.189 \\ (.113) & (.060) \\ 1.308 & -.482 \\ (.173) & (.097) \end{bmatrix} B^7 - \begin{bmatrix} -.302 & .075 \\ (.115) & (.058) \\ 0 & .087 \\ (.) & (.068) \end{bmatrix} B^8 \right\} \begin{bmatrix} \text{Worry}_t \\ \text{Anxiety}_t \end{bmatrix} = \begin{bmatrix} 0.578 \\ (0.650) \\ 0.030 \\ (0.990) \end{bmatrix} + \begin{bmatrix} \text{Worry}_{at} \\ \text{Anxiety}_{at} \end{bmatrix}$$

Participant 12

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.294 & .342\\ (.206) & (.185)\\ -.213 & .864\\ (.219) & (.200)\end{bmatrix} B\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}9.919\\ (3.808)\\ 12.977\\ (4.189)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}0 & .176\\ (.) & (.098)\\ 0 & .034\\ (.) & (.107)\end{bmatrix} B^9\right\} + \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 13

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.115 & .455\\ (.062) & (.080)\\ 0 & .641\\ (.) & (.084)\end{bmatrix} B - \begin{bmatrix}.519 & -.457\\ (.091) & (.078)\\ -.103 & 0\\ (.100) & (.)\end{bmatrix} B^3 - \begin{bmatrix}.277 & -.126\\ (.096) & (.086)\\ .350 & -.137\\ (.117) & (.114)\end{bmatrix} B^9\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}2.901\\ (1.369)\\ 3.508\\ (1.904)\end{bmatrix} +$$

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.497 & -.492\\ (.151) & (.148)\\ -.704 & .311\\ (.202) & (187)\end{bmatrix} B^3\right\} + \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 14

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.194 & 0\\ (.105) & (.)\\ .137 & 0\\ (.095) & (.)\end{bmatrix} B^2\right\}\begin{bmatrix}\text{Worry}_{t}\\ \text{Anxiety}_{t}\end{bmatrix} = \begin{bmatrix}32.460\\ (4.836)\\ 41.090\\ (4.310)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.373 & 0\\ (.079) & (.)\\ 0 & -.293\\ (.) & (.080)\end{bmatrix} B\right\} + \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 15

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}0 & .578\\ (.) & (.127)\\ -.497 & 1.196\\ (.153) & (.143)\end{bmatrix} B\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}4.507\\ (3.228)\\ 4.297\\ (2.493)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.821 & 1.030\\ (.207) & (.235)\\ -.889 & 1.132\\ (.263) & (.249)\end{bmatrix} B\right\} + \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 16

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.365 & 0\\ (.071) & (.)\\ 0 & .427\\ (.) & (.070)\end{bmatrix} B\right\}\begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}28.243\\ (4.084)\\ 28.942\\ (4.325)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.320 & 0\\ (.090) & (.)\\ -.601 & .224\\ (.126) & (.091)\end{bmatrix} B^2 - \begin{bmatrix}-.387 & 0\\ (.087) & (.)\\ -.691 & .411\\ (.126) & (.089)\end{bmatrix} B^4\right\}$$

$$+ \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 17

$$\left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .744 & -.514 \\ (.129) & (.200) \\ 0 & .193 \\ (.) & (.112) \end{bmatrix} B - \begin{bmatrix} .135 & .237 \\ (.073) & (.113) \\ 0 & .066 \\ (.) & (.077) \end{bmatrix} B^3 - \begin{bmatrix} .352 & -.515 \\ (.132) & (.150) \\ .198 & -.357 \\ (.101) & (.119) \end{bmatrix} B^6 - \begin{bmatrix} 0 & .434 \\ (.) & (.102) \\ .094 & .389 \\ (.074) & (.100) \end{bmatrix} B^7 - \begin{bmatrix} -.042 & .188 \\ (.097) & (.081) \\ .165 & 0 \\ (.067) & (.) \end{bmatrix} B^9 \right\}$$

$$\begin{bmatrix} Worry_t \\ Anxiety_t \end{bmatrix} = \begin{bmatrix} 3.193 \\ (2.326) \\ 2.524 \\ (2.287) \end{bmatrix} + \left\{ \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} .735 & -1.109 \\ (.131) & (.223) \\ 0 & -.353 \\ (.) & (.124) \end{bmatrix} B \right\} + \begin{bmatrix} Worry_{at} \\ Anxiety_{at} \end{bmatrix}$$

Participant 18

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.309 & 0\\ (.082) & (.)\\ .232 & 0\\ (.068) & (.)\end{bmatrix} B - \begin{bmatrix}.294 & -.394\\ (.073) & (.089)\\ 0 & 0\\ (.) & (.)\end{bmatrix} B^{9}\right\} \begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}22.511\\ (3.389)\\ 16.778\\ (2.621)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-1.068 & .953\\ (.190) & (.231)\\ -.928 & .851\\ (.163) & (.198)\end{bmatrix} B^{11}\right\}$$

$$+ \begin{bmatrix}\text{Worry}_{at}\\ \text{Anxiety}_{at}\end{bmatrix}$$

Participant 19

$$\left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}.543 & -.186\\ (.104) & (.092)\\ .178 & 0\\ (.067) & (.)\end{bmatrix} B - \begin{bmatrix}-.627 & .835\\ (.123) & (.110)\\ -.294 & 1.037\\ (.116) & (.066)\end{bmatrix} B^{2}\right\} \begin{bmatrix}\text{Worry}_t\\ \text{Anxiety}_t\end{bmatrix} = \begin{bmatrix}5.147\\ (1.715)\\ 0.417\\ (1.049)\end{bmatrix} + \left\{\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix} - \begin{bmatrix}-.258 & .450\\ (.106) & (.141)\\ 0 & .640\\ (.) & (.085)\end{bmatrix} B^{2} -\right.$$

$$\left\{\begin{bmatrix} .724 & -.649 \\ (.128) & (.133) \\ .270 & -.276 \\ (.129) & (.128) \end{bmatrix} B^{9}\right\} + \begin{bmatrix} Worry_{at} \\ Anxiety_{at} \end{bmatrix}$$

Participant 20

$$\left\{\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} -.672 & 1.969 \\ (.255) & (.334) \\ -.971 & 2.042 \\ (.235) & (.252) \end{bmatrix} B - \begin{bmatrix} .250 & -.510 \\ (.164) & (.191) \\ .173 & -.250 \\ (.136) & (.142) \end{bmatrix} B^{3}\right\} \begin{bmatrix} Worry_{t} \\ Anxiety_{t} \end{bmatrix} = \begin{bmatrix} 2.297 \\ (1.598) \\ 1.811 \\ (1.059) \end{bmatrix} + \left\{\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} -.999 & 1.986 \\ (.239) & (.336) \\ -1.191 & 1.868 \\ (.219) & (.235) \end{bmatrix} B\right\}$$

$$+ \begin{bmatrix} Worry_{at} \\ Anxiety_{at} \end{bmatrix}$$