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TAKIWASI: ADDICTION TREATMENT IN THE
“SINGING HOUSE”

by

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STATEMENT OF CONTRIBUTION OF OTHERS

The following list details the contribution of others to the project:

- Intellectual Support
 - Initial research design: Zoltán Sarnyai (biological), Frances Quirk (psychological), and Robin Rodd (anthropological).
 - Design modifications: Fernando Mendive and Ilana Berlowitz translated the Craving Experience Questionnaire to Spanish, and are responsible for its subsequent inclusion in the project. Both also contributed ongoing discussion regarding logistics and design feasibility in the Takiwasi context.
 - Data analysis: Michel Sauvain and Denis Helan Castillo Pareja carried out the laboratory analyses of salivary cortisol levels at Cayetano Heredia University, Lima, Peru. Zoltán Sarnyai contributed analytical ideas, discussion, and guidance.
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ABSTRACT

Takiwasi is an addiction treatment centre located in Peru that fuses traditional Amazonian medicine (including the use of psychoactive plants, such as ayahuasca) with Western medicine and psychotherapeutic techniques. Anecdotal and indirect evidence suggests that the treatment could be highly effective for certain individuals, yet rigorous studies have been rare. Given the centre's medical pluralism, I develop and utilize a research approach based on a reappraisal of George Engel's biopsychosocial model; that is, a biopsychosocial model founded on critical pragmatism. The basic relationship between stress, addiction, and the environment is represented in a new model of addiction, which is then elaborated upon in terms of critical psychosocial theory. Such an approach draws on biology, psychology, anthropology, and sociology in an attempt to understand not only Takiwasi, but the phenomenon of addiction itself in relation to the modern world.

Results from the study of Takiwasi patients undergoing treatment (with methods including ethnographic fieldwork, psychological testing, and salivary cortisol measurement) indicate not only an absence of harm, but also the presence of clinically positive change for the majority of patients. Within the treatment context, it seems likely that profound (yet poorly understood) biological and psychological mechanisms are associated with these changes, although the nature of the treatment also leads to discussion of alternate healing mechanisms which exceed current Western medical rationality. Contextualizing these results within a critical biopsychosocial model of addiction challenges the adequacy of the biomedical "brain disease" paradigm, and also demonstrates the logical deficiency (and potential danger) of asocial and ahistorical theories of addiction. Finally, addiction is considered from the perspective of classical critical theory, with Takiwasi demonstrating a potentially resistive process against a dangerous tendency embedded in the project of modernity.

*Dedicated to the patients
of Takiwasi*

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Introduction

In modern post-industrial societies, complex chronic diseases have supplanted infectious diseases as the primary public health concern (a change known as the “epidemiological transition”; Wilkinson, 1994). Addiction is arguably one such public health problem (Sussman, Lisha, & Griffiths, 2011), and in biomedical terms it is commonly considered to be a chronic “brain disease” (Leshner, 1997; McLellan, Lewis, O’Brien, & Kleber, 2000; McLellan et al., 2014). Chronic diseases are generally associated with a complex range of biological, psychological, and social antecedents, and addiction is no exception (Alexander, 2000; Shaffer et al., 2004; J. Wallace, 1993). Faced with such complexity, medical reliance on purely reductionist explanations would appear to be insufficient (Ahn, Tewari, Poon, & Phillips, 2006a, 2006b).

In this thesis, the explanatory adequacy (but not utility) of single discipline reductionism is called into question through the development and application of an interdisciplinary (Nissani, 1997) framework for addiction research. More specifically, this thesis contains analyses of: (a) addiction as a biopsychosocial and historical phenomenon; (b) the treatment of addiction in a medically pluralistic South American centre (i.e., one that employs both traditional Amazonian and Western techniques); and (c) the relationship of modernity to the centre’s treatment programme, the concept of addiction as a biomedical disease, and the subsequent possibilities and implications of cure.

1.1 Thesis Outline

The basic structure of the thesis is broken into three logical parts: (a) theory, (b) praxis, and (c) synthesis.

Part I — Theory and conceptual framework

Part one of the thesis consists of a single chapter aimed at developing George Engel’s biopsychosocial model into a vehicle for interdisciplinary addiction re-

search. Engel's original model (1977) is reinterpreted along the lines of what might be called critical pragmatism (Kadlec, 2006; Lewis, 2007), and based on this reinterpreted model, a plausible synthesis of various disciplinary theories is provided (with stress used as a linking concept). The model leads to what I have called a *critical biopsychosocial* approach, and it is used as the basis for all subsequent work in the thesis.

Part II — Takiwasi

The second part, which forms the bulk of the thesis (i.e., chapters 3–7), localizes the critical biopsychosocial approach in an empirical study of a specific addiction treatment centre. The centre, named *Takiwasi*,¹ is situated in the Peruvian city of Tarapoto in a geographical area known as the *selva baja* (low jungle). In terms of treatment, the centre is most well-known for the therapeutic use of *ayahuasca*²—a psychoactive plant preparation with a history of indigenous and shamanic usage (Andritzky, 1989; Brabec de Mori, 2011; Flores & Lewis, 1978; Luna, 2011; Naranjo, 1979; Schultes, 1982). From a Western psychiatric perspective, ayahuasca would be categorized as a hallucinogen³ since it contains, amongst other alkaloids, the highly psychoactive N,N-dimethyltryptamine (DMT; Riba, McIlhenny, Valle, Bouso, & Barker, 2012; Strassman, 1996).

While the use of hallucinogens in addiction treatment may appear to be somewhat unusual (especially so in cases of drug addiction), ayahuasca has in fact been associated with positive change for substance abusers (Grob et al., 1996; Liester & Prickett, 2012; Loizaga-Velder & Verres, 2014; Thomas, Lucas, Capler, Tupper, & Martin, 2013), and indeed a wide range of traditional approaches have been applied to addiction treatment (Jilek, 1994; Pascarosa, Futterman, & Halsweig, 1976). Both ayahuasca and DMT are capable of inducing spiritual experiences (Kjellgren, Eriksson, & Norlander, 2009; Strassman, 2001), and the consistently inverse relationship between spiritual practice and addiction (Geppert, Bogenschutz, & Miller, 2007) seems to be related to calls for the integration of shamanic techniques into treatment (Boeving, 2010; Rich, 2012; Winkelman, 2001; Winkelman & Roberts, 2007).

Despite an implicit assumption amongst ayahuasca researchers that the Takiwasi treatment is likely to provide benefits for its patients (Labate, Santos, Anderson, Mercante, & Barbosa, 2010, p. 221), there has been a lack of rigorous research on putative treatment effects. Broadly speaking, the second part of this thesis is an attempt to redress that situation. However, certain aspects of traditional Amazonian medicine are being affected by globalization (Beyer, 2012; Labate, 2014; Tupper, 2009), and chapter 3 charts the relationship of Takiwasi

¹Although Spanish is now the dominant language in Peru, the name “Takiwasi” is derived from the Quechua language family (King & Hornberger, 2004).

²Approximately translating from the Quechua to “vine of the soul”.

³However, culturally accepted patterns of hallucinogen usage are acknowledged (American Psychiatric Association, 2013b, p. 526).

to this ongoing historical process, as well as to scientific enquiry (which has its own history of research with hallucinogens; Grob, 1994; Morris, 2008; Strassman, 1991).

In chapter 4 the medically pluralistic model of Takiwasi is closely examined, with an outline of the prevailing theories of health, illness, and addiction that are expressed through the logic of the treatment. An overview of actual treatment practice is presented in chapter 5, with a primary focus on patient experience, as well as a review of the most prominent changes that patients either underwent themselves, or witnessed in others. The last two chapters in the part concern the quantitative measurement of within-treatment patient change, with reports of psychological measurement in chapter 6, and biological measurement in chapter 7.

Part III — Synthesis

The third and final part of the thesis (chapter 8) contains analyses which synthesize the findings from the empirical investigation of Takiwasi (i.e., Part II), and also considers the overall implications of those findings in terms of the critical biopsychosocial framework outlined in Part I. Beyond the issue of Takiwasi's treatment effectiveness (as opposed to efficacy),⁴ the meaning of the treatment itself is considered in relation to modernity, with issues ranging from treatment integration to the very notions of addiction and cure.

1.2 Methodological Summary

The overarching methodological aim of this thesis is to connect disciplinary knowledge. Although the approach will be further detailed in chapter 2, similar ideas can be found in the “holistic” type of triangulation described by Jick (1979, p. 603), in Wilson's notion of “consilience” (Wilson, 1998), in the concept of “evidentiary pluralism” (e.g., Tucker & Roth, 2006), and in the multidimensional addiction recovery model put forward by Dodge, Krantz, and Kenny (2010). The key element, however, is the requirement for epistemological flexibility (without which truly interdisciplinary work is infeasible). Here a short overview of the methods employed will be provided.

Social methods

Just what is meant by the *social* is one of the primary questions driving the framework in chapter 2. In brief, the social is dealt with in this thesis on both a macro scale and an experiential micro scale. The macro level analyses concern: (a) the relationships between addiction, modernity, and scientific enquiry; (b) Takiwasi's

⁴*Efficacy* refers to treatment effects under idealized conditions (e.g., a randomized controlled trial), whereas *effectiveness* refers to treatment effects in a real-world care setting (Flay, 1986).

relationship to the history and culture of traditional Amazonian medicine; and (c) the implications of Takiwasi's treatment in modern context. These analyses are primarily based on published anthropological, sociological, and historical work.

The micro level analyses are based on 12 months of anthropological fieldwork that I conducted between 2014 and 2015, and predominantly concern the Takiwasi treatment as understood by staff and patients. The data sources that I draw on include recorded interviews with patients and staff, written fieldnotes, and field-based audio recordings. Where patients and staff are directly quoted, spoken-word redundancies were sometimes removed from the textual representations, although care was taken not to alter the original meaning (in a manner somewhat similar to Bourgois & Schonberg, 2009, pp. 12–13).

Perhaps the most important element, however, was that of participant observation. This technique is designed to provide a certain depth of understanding (Vidich & Shapiro, 1955), and Ingold (2008) describes its central significance in anthropological terms:

[Anthropology] is not a study *of* at all, but a study *with*. Anthropologists work and study *with* people. Immersed with them in an environment of joint activity, they learn to see things (or hear them, or touch them) in the ways their teachers and companions do. [Anthropology], therefore, does more than furnish us with knowledge about the world—about people and their societies. It rather educates our perception of the world, and opens our eyes and minds to other possibilities of being. (p. 82)

It is not so much an analysis of Takiwasi as a cultural system that I aim for (which would be quite a complicated undertaking given the diversity found within the centre), but rather an understanding of the ways of being that Takiwasi facilitates (and which are not necessarily developed through human interactions). In the final part of the thesis, the micro level findings are positioned against a macro level social analysis.

Psychological methods

I administered various quantitative psychological tests to Takiwasi inpatients over the course of treatment. The constructs measured included: (a) stress, (b) religious and existential well-being, (c) physical and mental health, (d) mental illness, (e) craving (drug or behavioural), and (f) neuropsychological functioning. The intention was to gauge the short-term treatment effects in reasonably broad psychological terms, while maintaining a connection to the framework outlined in chapter 2. Full details of the quantitative psychological investigation can be found in chapter 6.

Biological methods

All patients who took part in psychological measurement also provided biological data in the form of saliva samples. These samples were analysed for cortisol levels, and they formed the biological link to the measurement of short-term treatment effects. The connection between addiction and stress (and hence cortisol) is explicated in chapter 2, and a full account of the biological measurement process and subsequent results can be found in chapter 7.

Field site limitations (Takiwasi)

Since its formal establishment in 1992 as a Peruvian not-for-profit operating with external financial support (“Historia del Centro Takiwasi”, n.d.), Takiwasi has expanded to become largely self-funded. Although the treatment of addiction remains the central goal (“Takiwasi”, n.d.), the organization has over 50 staff members who carry out functions extending beyond the therapeutic. The organizational structure can be broken down into three distinct groups:

1. The therapeutic team, which includes psychologists (therapists), *curanderos* (traditional healers), doctors, nurses, a Catholic priest, and a host of transient workshop facilitators.
2. The support team, which includes staff for administration and maintenance, health research, library support, information technology, and security.
3. The laboratory team, which includes staff members who manufacture natural products (see “Laboratorio Takiwasi: Productos naturales”, n.d.), conduct sales and marketing, and also undertake product research and development.

In addition to the members of these teams who work inside the 2.5 hectare grounds, there are quite frequently groups of foreigners at Takiwasi who are attending special seminars or retreats. The financial input from these foreign groups, along with the sale of natural products in South America, contributes significantly to Takiwasi’s self-sufficiency (D’Aguiar & Zahlten, 2015). At any given time there may also be volunteers, students, researchers, and psychologists or *curanderos* who are visiting Takiwasi for various purposes and lengths of time.

In this thesis, the work presented on Takiwasi is constrained to the therapeutic aspects of the centre only, and principally deals with staff and inpatient perspectives in that context. As will be seen in chapter 5, there is an institutionally imposed separation of inpatient life from other aspects of the centre, and the limited analytical focus is therefore not an artificial construction.

1.3 Brief Note on Style

The writing (and referencing) style used in this thesis draws on the *Publication Manual of the American Psychological Association* (6th ed.; American Psychological Association [APA], 2010), although document typesetting diverges from APA style for the benefit of readability. To ensure clarity when quoting, all modifications to quoted sources have been set in square brackets (including any ellipses used to denote omissions). As recommended by the APA for single author works, the personal pronoun *I* is used in place of ambiguous or unwieldy third person constructions (APA, 2010, p. 69). Of course, the use of personal pronouns is necessarily more liberal in sections where the content is related to ethnographic fieldwork.

The spelling in this thesis generally follows the *Shorter Oxford English Dictionary* (6th ed.; Oxford University Press, 2007). Therefore many words that are commonly formed with an *-ise* suffix in British English are formed herein with an *-ize* suffix (and vice versa for certain words formed with *-ize* in American English). The rationale is etymological, and accordingly is concerned with the historical roots of words rather than the popular usage that occurs in various English-speaking countries (Oxford Dictionaries, 2011).

Part I

Theory and Conceptual Framework

Addiction: Revisiting the Biopsychosocial Model

Synopsis Before proceeding to the work on Takiwasi, it is necessary to lay out exactly what is meant by addiction, since the term has a range of technical and popular meanings. Furthermore, the theoretical framework within which the research is located must be explicated, which is achieved here through a reworking of the biopsychosocial model positioned in terms of a novel perspective on addiction. It is true that the study of addiction has generated a plethora of theories and models (e.g., Skinner & Aubin, 2010), and one may wonder why yet another is called for. Actually, what follows in this chapter is not so much a new theory of addiction, but rather the synthesis of other theories and empirical work in the pursuit of what Michael Agar (2002) calls the (unfashionable) act of “grand theorizing”. This approach hinges on an “integration of explanations from several levels around a particular phenomenon of interest” (Agar, 2002, p. 255). In this case, the phenomenon of interest is addiction and its conjunction with stress.

As addiction research is very much multidisciplinary, broad input from the natural sciences, social sciences, and the humanities has created a great range of perspectives which appear difficult to unite. Yet the phenomenon of addiction itself remains impervious to disciplinary points of view. The prevalence of addictions in society may be far higher than expected (Sussman et al., 2011), and it has been suggested that at least drug addiction should be seen as a chronic medical illness (McLellan et al., 2000). I argue that the problem of addiction can only be properly understood when its antecedents and subsequent effects are recognized as simultaneously biological, psychological, and social in their nature. Of course, this is hardly a new claim (e.g., J. Wallace, 1993); however, as Dunbar, Kushner, and Herzberg (2010) remark: “There are still major gaps in willingness and ability to reconcile the range of distinct perspectives within the social sciences, the humanities and the biosciences” (p. 6). The broad aims of this chapter then are threefold: They are to (a) reinterpret the biopsychosocial

model in order to facilitate interdisciplinary communication, (b) present a model of addiction that is based on the reinterpreted biopsychosocial framework, and (c) connect addiction theory with social analysis.

2.1 Defining Addiction

The paradigmatic form of addiction is drug addiction, and since the nineteenth century it has almost come to be considered synonymous with addiction itself (Alexander & Schweighofer, 1988). However, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013a) acknowledges non-drug addiction; albeit limited to pathological gambling. The rationale for its inclusion is “evidence that gambling behaviors activate reward systems similar to those activated by drugs of abuse and produce some behavioral symptoms that appear comparable to those produced by the substance use disorders” (p. 481). Other possibly addictive activities are rejected due to “insufficient peer-reviewed evidence” (p. 481).

The DSM-5 takes a conservative approach to classifying addictions that is based on the hallmark of drug abuse—activation of the reward pathways. But these pathways are also activated by behaviours such as eating, shopping, or viewing pornography. Can pathological involvement in these non-drug behaviours really be described as addictive? Their eventual psychiatric classification as such may be inevitable (M. Griffiths, 2005). Hilton and Watts (2011) reviewed recent studies showing evidence that the neural impulse control impairments found in cocaine and methamphetamine addicts are also found in obese overeaters, paedophiles, and those unable to control their sexual impulses (and see Volkow, Wang, Fowler, & Telang, 2008). Furthermore, over-expression of Δ FosB in the nucleus accumbens (NAc), known to occur reliably with drug abuse (Robison & Nestler, 2011), has also been demonstrated to occur with increased sexual activity and eating (D. L. Wallace et al., 2008); leading to the suggestion that drug and “natural” addictions share overlapping neural pathways (Nestler, 2005; Robison & Nestler, 2011).

It is quite clear that pathological involvement in “natural” behaviours can develop and persist in spite of severe individual or social consequences. There are increasing numbers of people that compulsively purchase goods to the point where serious emotional, social, financial, and occupational problems are manifested (Benson & Eisenach, 2013; Lejoyeux & Weinstein, 2010). Internet addiction was identified over a decade ago (Young, 1998), and there was a recent well-publicized case involving two young Korean parents who devoted so much time to raising a “virtual baby” at an Internet cafe that their real baby, only three months old, was starved to death from neglect (Tran, 2010). There seems to be no limit to the activities that can produce addictive behaviour, for example with studies now being conducted into the specific types of content that smartphone users are becoming addicted to (Jeong, Kim, Yum, & Hwang, 2016).

From an experiential point of view, addictions represent “a state in which a person’s life is given over to a single pursuit, or a narrow range of pursuits, to the detriment of a broader, more balanced lifestyle” (Alexander, 2000, p. 503). Such a state is further characterized by “compulsivity and an absence of a fuller psychosocial integration, rather than merely an annoying habit contained within an otherwise normal life. [The] phrase ‘overwhelming involvement’ sums up this traditional meaning of addiction concisely” (p. 503). This classical definition captures the essence of addiction, and it is the sense in which the word is used in this thesis. In spite of this, much of the theory and data to be presented remains focused on drug addiction, simply because it is by far the most widely researched, particularly at the biological level.

2.2 The Biopsychosocial Model

History and analysis

In the late 1970s George Engel presented his now widely influential biopsychosocial (BPS) model to challenge a perceived biomedical dominance in medicine and psychiatry (Engel, 1977). The core of Engel’s argument was that the biomedical model, built on a philosophy of reductionist materialism, implied that all disease phenomena could ultimately be explained in terms of the natural sciences, in particular through the language of biology. Moreover, Engel argued that adherence to reductionist materialism proceeded alongside a dualistic mind-body praxis which separated the mental from the somatic. Psychosocial factors were therefore seen as secondary to the reality of the underlying biological illness. Engel’s purpose was not to elevate psychosocial factors above the biological, but rather to demonstrate the interconnected nature of the biological, psychological, and social (for a clinical example see Engel, 1980).

Borrowing from biology, Engel (1980) made use of general systems theory as a way to conceptualize the BPS model. The goal under systems theory is to understand the functioning of the whole (the system) as a naturally occurring hierarchy of levels. Levels can be seen to function as dynamic wholes on their own terms (i.e., systems), with appropriate methods of study varying from level to level. Therefore each individual level is at once a whole, and a component of higher levels. Ranging from molecules to cells, nervous systems to individuals, and from cultures to whole societies, the natural world is laid out in an increasingly complex relational hierarchy where nothing is isolated.

The implication of this view is that we cannot fully describe human systems (and hence illness, health, or addiction) using only the terms of biology, nor can we describe them as strictly psychological or social. Such a view is particularly relevant for chronic illnesses (Ahn et al., 2006a, 2006b). That being said, the model does not oppose reductionism. It is in fact required, with the caveat that the biological, psychological, and social levels are taken into account whilst seeking

to understand the relations between them. In this sense, the aim is to obtain a kind of holistic reductionism.

While there are conflicting opinions over the status and value of the model in medicine and psychiatry after some 30 years (e.g., R. H. Adler, 2009; Epstein & Borrell-Carrio, 2005; Mauksch, 2005; McLaren, 2006), there have been recent calls for a return to the model (Frances, 2014), and it is with respect to addiction research that I would like to advance its application. Despite maintaining an intuitive appeal, it has been suggested that the BPS model is too broad in scope, giving no clear indication on how to prioritize one level over another. Therefore, according to Ghaemi (2009), the BPS model degenerates into idiosyncratic eclecticism. Although this argument may have some weight in clinical practice, it fails to appreciate the inherent potential in the BPS model for research, namely the broadening of medical knowledge through genuine interdisciplinary communication (e.g., Novack et al., 2007). Unfortunately, it is no easy task to synthesize disciplinary knowledge once epistemology and methodology begins to diverge, but the systems theoretical foundation of the BPS model makes this task more approachable.

Essential elements of a biopsychosocial theory

Even though addiction has biological, psychological, and social components, it can be difficult to combine these to provide something more than a varied “multidisciplinary list”. Fortunately, there are two elements of the BPS model that can be exploited to overcome this. The first is the necessity of a relational point of view. From a research perspective it is not sufficient to only state factors of influence at each level; rather we should strive also to explain the interactions between them. This requires theoretical links that are empirically verifiable and accessible at the biological, psychological, and social levels.

The second element is that the logic of each level should be dealt with on its own terms, meaning in practice that we should seek out the research perspectives of disciplines relevant to each level. It is probably fair to say that the conceptualization of the “social” in BPS often does not go far beyond the sort offered by quantitative psychology or epidemiology (e.g., by examining variables such as socioeconomic status). The theoretical vagueness of the social is a problem that will be addressed further ahead, but for now I would like to suggest that anthropological and sociological perspectives have much to offer BPS addiction research, largely through the introduction of new ways to conceive of and understand forces which operate at the social level.

In order to demonstrate that cross-disciplinary connections via empirical links are necessary elements in a BPS theory, I will briefly present some results from existing studies on stress and addiction with the dual purpose of establishing stress as a linking concept, and expanding the conceptual potential in the social.

Stress and drug addiction: An empirical example

Biological factors

The basic functioning of the hypothalamic-pituitary-adrenal (HPA) axis in the stress response is well established. It begins with the secretion of corticotropin-releasing factor (CRF) from the hypothalamus, which in turn stimulates adrenocorticotrophic hormone (ACTH) release from the anterior pituitary. The increase in circulating ACTH prompts the adrenal cortex to synthesize and secrete glucocorticoids (primarily cortisol in humans). While short-term stress may be adaptive, long-term exposure to stress is detrimental. The final product of the stress response (the release of glucocorticoids) has an inhibitory effect on CRF and ACTH production; therefore normal HPA-axis activity functions as a negative feedback loop (Herman & Cullinan, 1997).

Most drugs of abuse activate the HPA-axis when administered acutely. Psychostimulants, cannabinoids, alcohol, and nicotine all cause HPA activation, although opioids have an inhibitory effect (Sarnyai, Shaham, & Heinrichs, 2001). However, the withdrawal syndrome for virtually all drugs of abuse is characterized by activation of the HPA-axis, irrespective of the acute effects (Kreek & Koob, 1998). In the case of opioids, the usual acute suppression of the HPA-axis is replaced by hyperactivity during withdrawal, and administration of an opiate will quickly reverse this effect (Kreek & Koob, 1998).

The propensity to relapse, in which stress often plays a major role, makes drug addiction particularly difficult to overcome (Goeders, 2003). In animal models, exposure to physical stress reinstates previously extinguished drug use, and relapse rates can be attenuated by administering a CRF-antagonist prior to the stressor (Sarnyai et al., 2001). In other words, neurochemically blocking the starting point of the HPA stress response inhibits drug relapse that would normally have occurred due to stress. Although this relapse effect does not generalize to all types of stress (Shaham, Erb, & Stewart, 2000), external factors such as increased environmental novelty and social contact decrease the HPA stress response (Belz, Kennell, Czambel, Rubin, & Rhodes, 2003; Benaroya-Milshtein et al., 2004), and may therefore protect against some forms of stress-based relapse (e.g., Chauvet, Lardeux, Goldberg, Jaber, & Solinas, 2009). Stress also promotes the acquisition of addiction itself (particularly uncontrollable stress; Goeders, 2003), and both increased environmental novelty and social contact have been shown to act in opposition to this effect (Alexander, Coombs, & Hadaway, 1978; Raz & Berger, 2010), likely via mediation of the stress response.

Psychological factors

The animal model demonstration of glucocorticoid production after exposure to a stressor is reproducible in humans. Under the Trier Social Stress Test (Kirschbaum, Pirke, & Hellhammer, 2008), participants are subjected to a multi-stage social stress procedure that significantly increases ACTH and glucocorticoid

production. In general, individual differences in the glucocorticoid response to stress are marked, although the qualities of uncertainty and unpredictability are effective in creating a stronger response (Mason, 1968).

In addition to biological measurement, the psychological approach to stress allows for the measurement of cognitive constructs (such as perceived stress, or drug craving) via self-report. When participants in drug use studies do not feel pressured by social desirability, self-report can be a valid data source (Darke, 2010; Jackson, Covell, Frisman, & Essock, 2005; Welp et al., 2003). It is likely that chronic drug use dysregulates HPA-axis functioning (Lovallo, 2006), and Sinha's (2007) work suggests that addicts in recovery suffer not only from a hypersensitivity to stress and negative affect, but also from a decreased ability to return to baseline after a stressful event. Sinha, Garcia, Paliwal, Kreek, and Rounsaville (2006) were able to predict the length of time to relapse in cocaine addicts based on stress-induced craving, whereas craving induced by drug-cue exposure did not predict time to relapse. In the same study, post-stress ACTH and glucocorticoid levels accounted for 19% of the variance in the amount of cocaine used during a subsequent follow-up period, with high HPA responders consuming significantly more cocaine than low responders (cf. Lovallo, 2006).

Social support is a key stress resilience factor for humans, and Ozbay, Fitterling, Charney, and Southwick (2008) suggest oxytocin (associated with social bonding; Lim & Young, 2006) as a potential physiological mechanism for reducing HPA-axis reactivity in the face of psychological stress. Heinrichs, Baumgartner, Kirschbaum, and Ehlert (2003) show that social support attenuates the stress response, with an even stronger anxiolytic effect occurring when coupled with oxytocin administration. Social support is protective against drug relapse (Havassy, Hall, & Wasserman, 1991), and once again, is likely to be related to an increased resilience to stress (e.g., S. Cohen & Wills, 1985). Indeed, the failure to achieve a sense of belonging through social integration increases the risk for a range of health problems (Berkman, 1995).

Social factors

Critical medical anthropology has recently drawn attention to the relationship between drug use and social structures in modern societies; including for example economic inequality, social class, and institutional power (Leatherman & Goodman, 2011; Singer, 2012). The social production of suffering and self-medication are two concepts that have direct relevance to addiction and stress, and they are central themes in the ethnographic work of Bourgois and Schonberg (2009). *Righteous Dopefiend*, the result of over a decade of in-depth ethnographic research with homeless drug addicts in San Francisco, is powerful in its stark portrayal of not only the misery of the addicts' lives, but also of the punitive and often cruel yet largely ineffective measures imposed on them by the state. Without exception, the addicts described therein have completely failed to integrate with mainstream society, and the stresses of their daily lives are very often extreme.

There are numerous stories recounting the homeless being evicted from their encampments by the police, their meagre possessions and makeshift homes dismantled and tossed into waste disposal trucks. When caught carrying needles, opiate addicts spent nights in prison suffering through agonizing withdrawal symptoms (Bourgois & Schonberg, 2009). For these homeless addicts in San Francisco, in addition to the daily stresses of living on the street, the police force were often simply an additional (and powerful) source of stress. Moreover, uncontrollable and unpredictable stressors not only enhance the rewarding effects of drugs themselves, but are potent in their ability to induce relapse after a period of abstinence (Goeders, 2003; Shaham et al., 1997). Bearing in mind the effects of stress on drug addiction and relapse, the punitive version of the “war on drugs” social policy appears, at least in the poorest segments of American society, to work against itself.¹

During the period of Bourgois and Schonberg’s ethnographic work, resources for addiction treatment were being cut (McLellan, 2006), with prisons remaining the best funded “treatment facilities” for the addicted poor in the United States (Bourgois, 2011, p. 3). The street-level realities of under-resourced methadone programs frequently played out very differently from the assumptions of policy makers (and see Soloway, 1974). Even the health care system provided little refuge, with the homeless and poor often being denied access to treatment due to lack of insurance. Bourgois and Schonberg (2009) describe the results of federal health funding cuts over a period of decades that slowly brought financial pressure to bear on hospitals:

Faced with insolvency in the 1990s, hospitals across the United States had to reorient health care delivery toward high-tech procedures for patients with private insurance while decreasing services for uninsured and publicly insured patients. At ground level, in the growing maelstrom engulfing county hospital emergency rooms, this structural problem caused by federal policy and the market-driven logic of privately financed health care was obscured to patients and service providers alike. Instead, overburdened clinicians disparaged the homeless as malingerers and “manipulative frequent flyers”. (p. 98)

Apart from questioning the ability of market-driven policies to meet health needs across social class gradients, ethnographic work has demonstrated that the social production of suffering is inextricably bound up with the production of stress, which has been shown here to be associated with addiction, treatment, and drug use outcomes.

¹ Indeed, Bourgois and Schonberg (2009) refer to this kind of counter-productive police action as “pathogenic law enforcement” (p. 111).

Expanding the “social” in biopsychosocial

One of the central contributions of the anthropological project is to approximate knowledge of subjective realities and ways of being in the world that the reader could not otherwise conceive of. Just as good science attempts to approximate the truth of the objective world, good anthropology attempts to approximate the truth of subjective worlds (which might comparatively build a more complete understanding of human beings; Ingold, 2008). Though they may be describing one and the same world in an absolute sense, it does not logically follow that the language or methods of one level of analysis will be sufficient to describe another level. Lilienfeld (2007) expresses this idea cogently:

Some levels of analysis are more informative for certain purposes than others. One could attempt to analyze the words in this paragraph by submitting their contents to an inorganic chemist, who could ascertain the molecules comprising the printed words on this page. Yet no amount of chemical analysis could shed light on what these words mean, let alone what they mean in the context of the other words in the paragraph. In this case, resorting to a lower level of analysis would be worse than useless, because it would waste valuable time in the effort to decipher the meaning of a text. (pp. 265–266)

So it is with the social world. If we cling too tightly to an epistemology that overvalues the natural sciences, we foster a narrow view that suffers from a number of conceptual blind spots. Culture, society, and the environment tend to be downplayed or taken for granted (potentially forming mass experimental artefacts), and the social world becomes a thing only to be quantified. But when the subjective aspects of the social are transformed exclusively into quantitative criteria, the resulting loss of context often obscures information that is essential for understanding (e.g., Reisinger, 2004).

The goal of medicine is to alleviate human suffering. It stands to reason then that medicine should be concerned with the conditions that cause and exacerbate human suffering and disease. I suggest, however, that medicine and science are themselves embedded in systems of modern rationality that restrict their capacity to engage in self-reflexive social critique (Horkheimer, 1972), in addition to constraining access to broader intellectual currents (Lewis, 2007). The failure of the American medical system to treat the poor and homeless described by Bourgois (2011) reflects social structural issues that call for philosophic rather than scientific discussion; yet in the dominant intellectual discourse method is seen to obviate the need for philosophy, much to the detriment of medicine.

If addiction is a chronic disease, then it is one that is intimately connected with the macro structures of society. Theoretical explication of these structures is necessary, but not sufficient for understanding addiction. The BPS model provides the framework for constructing a more refined theory of addiction, but to reach beyond the epistemological precepts of individual disciplines requires

a reinterpretation of the BPS model along the lines of philosophical pragmatism (Lewis, 2007). A pragmatism that concerns itself with reflexive criticism of what is prevalent in its own society might properly be called critical pragmatism (Kadlec, 2006). The approach that follows then is an attempt to use stress as the empirical connection to understand addiction—as it occurs in modern societies—from the divergent perspectives found between the natural and social sciences, as well as the humanities.

2.3 Critical Biopsychosocial Theory: Addiction and Stress

Biological theory

Stress as biological response

In order to survive, an organism must maintain its physiological processes within ranges that are conducive to life, depending on the demands placed on it from moment to moment. This maintenance of basic physiological functioning at relatively stable states in the context of environmental challenge was termed *homeostasis* by Walter Cannon (1929). Hans Selye maintained that while a stressor (either physical or psycho-emotional) would impact homeostasis in varying ways, there would always be a “non-specific” physiological response; meaning a general mechanism that was activated by all threats to homeostasis. The functioning of the HPA-axis, and subsequent glucocorticoid production, was seen to be part of this general response system.

Homeostasis implies an internally adjustable, but mostly stable, stimulus-response relationship of physiological processes to environmental challenge. The concept of *allostasis*, as defined by McEwen and Wingfield (2003), separates out the stability of processes that are absolutely essential for life (homeostasis), from the dynamic processes that support homeostasis and maintain stability through change (allostasis). The mediators of allostasis include, amongst others, HPA-axis hormones (CRF, ACTH, and glucocorticoids) and the catecholamines of the sympathetic adrenal medullary system (SAMS; the “flight or flight” mechanism). An *allostatic state* occurs when there is a sustained alteration of activity in one or more mediators; for example the disturbed diurnal cortisol rhythms that result from drug abuse (Lovallo, 2006). *Allostatic load* refers to the price the body pays for maintaining an allostatic state (i.e., the cumulative physiological result). An allostatic state is an adaptive response that can be maintained for a certain period of time; however, once the organism’s ability to cope has been exceeded (e.g., through the imposition of additional loads), an *allostatic overload* occurs that can lead to pathology.

The allostatic view of stress is in many ways similar to Selye’s non-specific response mechanism. However, allostasis provides a heuristic with which to understand adaptation to stress while taking into account the normal demands of the life cycle. Within McEwen’s model, allostasis occurs on a continuum ranging

from regular life cycle demands to unpredictable environmental challenges. The term stress then becomes reserved for those unpredictable environmental challenges that induce allostatic load.

Neurobiology of addiction

The concept of an allostatic state was originally introduced by Koob and Le Moal (2001) to explain the neural changes that occur with the transition to drug addiction. Within this context, both the dopaminergic reward and stress response systems are seen to progress toward new *set points* through allostasis. Termed a theory of “neural opponent motivation” by Skinner and Aubin (2010), the allostatic theory of addiction is underpinned by the opponent-process theory of motivation.

Opponent-process theory models a fundamental dynamic of affect and motivation (R. L. Solomon, 1980). For a given stimulus that elicits an affective psychological state (either pleasant or unpleasant; the *A* state), in general an opposing affective state will follow (the *B* state; which occurs before returning to baseline). The processes that drive these states are similarly termed the *a-process*, and the *b-process*. The function of the b-process is to oppose and reduce the affective *A* state (regardless of its hedonic quality). For example, the removal of an aversive stimulus that is painful (*A*) results in a pleasant feeling of relief (*B*); whereas the removal of a stimulus that is pleasurable (*A*) results in a temporary aversive feeling of longing (*B*).

Based on compelling experimental and observational data, R. L. Solomon and Corbit (1974) discovered an important commonality in the adaptation of opposing states over time: As exposure to a stimulus is repeated, the *A* state (irrespective of hedonic quality) becomes shorter and weaker, while the opposing *B* state lengthens and increases in intensity. Therefore, if the repeated stimulus is a drug of abuse, the initial pleasurable state arising from the *a-process* will attenuate over time (resulting in tolerance), while the aversive state arising from the *b-process* will grow (producing withdrawal). Once addiction has taken hold, the purpose of the *a-process* is essentially to maintain affective stability by counteracting the powerful, and now long-lasting, *b-process* (i.e., withdrawal).

Opponent-process theory thus models addiction as a change in the motivational force behind drug use, or more specifically, as a movement from an initial positive reinforcement to a subsequent negative reinforcement. While this model explains the transition to addiction and the difficulty of overcoming withdrawal, it cannot account for the fact that many relapses occur post-withdrawal. The allostatic model of addiction (Koob & Le Moal, 2001) extends opponent process theory and accounts for post-withdrawal relapse through persistent allostatic changes in the neural systems representing the *a* and *b* processes. Just as with opponent-process theory, the allostatic model of addiction predicts an intensification of the *B* state over time. Critically however, the allostatic model allows the affective baseline to shift dynamically via allostatic dysregulation of the *a* and

b processes. In this way, an apparent hedonic stability is maintained while the hedonic baseline is continually altered.

Two kinds of neuroadaptations help to explain the allostatic changes that occur with the transition to drug addiction: within-system and between-system (George, Le Moal, & Koob, 2012). In within-system adaptation an opposing reaction takes place in the same systems where the drug exerts its primary action. Dysregulation of the mesolimbic dopaminergic system (a major part of the “reward pathway”) is a within-system adaptation that appears to be common across drugs of abuse (Diana, 2011; Volkow, Fowler, Wang, & Swanson, 2004). Thus the increased dopaminergic activity in the NAc and lowered reward thresholds apparent during acute drug abuse later become decreased dopaminergic activity and increased reward thresholds. Between-system adaptation has been hypothesized to occur in the extra-hypothalamic CRF system of the extended amygdala, which may regulate HPA-axis functioning and also sensitize the dopaminergic system to CRF release (George et al., 2012). In opponent-process terms, the allostatic changes in the reward system contribute to the weakening a-process, while continuing recruitment via allostatic change in the stress system contributes to the growing b-process. Persistent dysregulation of the stress system, and its connections to the reward pathways, may explain why post-withdrawal relapse is such a troublesome problem in many cases of drug addiction.

Biological effects of the environment

Drug abuse can be seen as a type of repeated environmental challenge that induces allostatic overload, thus leading to allostatic changes that eventually come to represent addiction. Viewed in this way, those allostatic states induced in the stress system (or antireward system; Koob & Le Moal, 2008) can also be developed by negative environmental conditions that subsequently make addiction easier to acquire, and harder to overcome. However, positive environmental conditions tend to have the opposite effect: In animal models, such conditions are broadly termed *environmental enrichment* (EE).

In general, EE has been operationalized as increased environmental novelty and freedom, an increased opportunity for social interaction, or both. While EE appears to have little direct effect on the dopaminergic reward system (Benaroya-Milshtein et al., 2004; Solinas, Thiriet, Chauvet, & Jaber, 2010), it is well-established that it attenuates the reactivity of the stress system (e.g., Benaroya-Milshtein et al., 2004), which in turn reduces addiction vulnerability. Moreover, CRF increases brain reward thresholds (Koob, 2003), thereby augmenting the difficulty in gaining satisfaction from natural rewards. Solinas et al. (2010) hypothesize that EE acts as a functional opposite to stress, and that it carries both preventative and curative potential for addiction. This view is supported by the finding that EE protects against stress and cue-based relapse, but not drug-primed relapse (Solinas et al., 2010).

In the preventative sense, EE provides a reserve that acts as a buffer against allostatic changes in the stress system (i.e., the hedonic baseline is shifted upwards prior to first drug use), while in the curative sense EE acts via reversed allostatic changes in the stress system. An example of the preventative effect is the epigenetic downregulation of CRF-R1 mRNA expression in the basolateral amygdala (which connects to the extended amygdala and the NAc) resulting from EE during development (Sztainberg, Kuperman, Tsoory, Lebow, & Chen, 2010). An instance of the curative effect is evidenced by the elimination of conditioned place preference and a reduction in behavioural sensitization to cocaine after 30 days of exposure to EE (Solinas, Chauvet, Thiriet, El Rawas, & Jaber, 2008).

In terms of drug abuse, allostatic recruitment of the stress system plays a strong role in post-withdrawal relapse, and it represents a crucial part of the b-process of addiction. In rodents, increases in environmental novelty, freedom, and social interaction serve to counteract the b-process, both before and after exposure to drugs. Therefore Solinas et al. (2010) have added another variable (termed *delta*) to the allostatic model, which reflects the anti-stress effect of EE as it shifts the hedonic baseline upwards (either creating a protective reserve, or counteracting an active b-process). It follows then that a lack of EE contributes to the development of addiction and also to its maintenance once established. The psychosocial processes that mediate delta in humans are of great interest then as they constitute a point of interchange between biological and psychosocial systems.

Psychological theory

Stress as meaning

McEwen and Wingfield's conception of Type 2 allostatic overload (2003) is an attempt to understand the health implications of stress in modern societies, where a competitive social structure is the dominant concern (as opposed to direct competition for natural resources). It is well-known that the incidence rates of many diseases are inversely related with socioeconomic status (SES; e.g., Morrison, Woodward, Leslie, & Tunstall-Pedoe, 1997); however, these relationships cannot be fully explained by access to health care, individual health behaviours, or poverty, as the gradient is maintained even in the upper levels of the SES hierarchy (N. E. Adler et al., 1994; Marmot et al., 1991).

Measures of allostatic load have been positively correlated with increased mortality rates independent of SES (Seeman, McEwen, Rowe, & Singer, 2001), and it provides a plausible mechanism for the influence of psychological functioning and stress on health across the gradient. For example, the psychological effects of social hierarchy positioning (N. E. Adler et al., 1994; Marmot et al., 1991), job insecurity (Burgard, Kalousova, & Seefeldt, 2012; Ferrie, Shipley, Stansfeld, & Marmot, 2002), or lack of control over the work environment may produce pathology via long-term elevation in allostatic mediators, such as glucocorticoids

and catecholamines (McEwen, 2000; McEwen & Wingfield, 2003).

The psychological interpretation of meaning, being a critical factor in the stress response and therefore in the generation of allostatic load, bridges the biological and the sociocultural. For example, monkeys that are subjected to starvation (i.e., actual food scarcity) show greater HPA-axis activation compared with those that are also physically starved, yet fed a zero-nutrient placebo (Mason, 1975). Although in both conditions the monkeys' bodies undergo the stress of starvation, the comforting experience of having "food" to eat reduces the physiological stress response (with the stomach itself also signalling satiety; Steinert, Meyer-Gerspach, & Beglinger, 2012). Thus even a physical stressor can carry an interpretative psychological element, the quality of which will be shaped by both biological and sociocultural influences.² Ice and James (2007) therefore define stress as a "process by which a stimulus elicits an emotional, behavioral and/or physiological response, which is conditioned by an individual's personal, biological and cultural context" (pp. 12–13). By appending the social structure to this definition, the stress concept then becomes a complete process in BPS context, with triggering events being termed *stressors*.

Modelling addiction, stress, and the environment

Psychology sits at the level of individual human experience; an experiential meeting point of summed personal biological, cultural, and social influences. As William James (1907/2014b) put it: "When we talk of reality 'independent' of human thinking, then, it seems a thing very hard to find" (para. 15). By combining the stress model of Ice and James (2007) with the allostatic EE model of Solinas et al. (2010), a new heuristic model of stress and addiction can be formed that allows for positive and negative environmental influences, whilst honouring the objective and subjective realities of lived experience (W. James, 1912/2014a).

Figure 2.1 models the BPS relationship between stress and addiction. The environment (A) is characterized by its basic relationship to stress as outlined by Solinas et al. (2010): *Impoverished environments* tend to produce stress, whereas enriched environments tend to produce the functional opposite (with respect to stress and addiction). This is represented as a dual-process, because it is possible for enriched environments to contain stressors, and so on. However, prior to experience, the environment's tendency to create an outcome should be considered probabilistically as the stress response is altered by individual differences in biocultural mediators (for a review of biological developmental effects, see Duffing, Greiner, Mathias, & Dougherty, 2014). The interaction at (B) refers to the total ongoing environmental experience, not only exceptional life events. Bioculturally mediated interpretation of the environment then takes place, which finally determines the individual's response (C); represented as a

²For example, the intentional fasting that occurs during Ramadan would elicit a differential stress response when compared with unwanted and uncontrollable food deprivation.

dynamic cluster of affective states (e.g., distress or contentment), physiological processes (e.g., allostasis), and behaviours (e.g., coping mechanisms). The results of the response will continually update addiction risk (D), since for the individual the meaning of the environment has been actualized; thus creating either stress and increased addiction risk, or the opposing force and decreased addiction risk.

Biocultural mediators have critical influence over the interpretation of events and the physiological response of the body (Hertzman & Boyce, 2010). For example, maternal licking and grooming for rat pups causes epigenetic changes in glucocorticoid receptor synthesis that express as permanent reductions in HPA-axis stress reactivity (Weaver et al., 2004). According to the model, this behaviour should constitute a protective reserve against addiction, and indeed increased maternal licking and grooming for rat pups correlates with decreased proclivity for cocaine and alcohol consumption in maturity (Francis & Kuhar, 2008). Human behaviour, however, is strongly mediated by cultural factors. For instance, the practice of meditation (by experts) has recently been shown to induce rapid epigenetic changes that improve cortisol recovery times after social stress (Kaliman et al., 2014). It could therefore be expected that meditation would provide some protection against addiction, but whether a society benefits from engagement with the practice or not depends on widely shared judgements regarding spirituality, the practical value of meditation, and so on. In reverse, culture may be implicated in creating stressors, for instance in societies afflicted by racism (Tull, Sheu, Butler, & Cornelious, 2005).

For human beings then it is not sufficient to consider only the material environment as enriched or impoverished; the psychological system that interprets the meaning of the environment and the relationship of the self to it, along with biocultural mediators, must also be considered. As pointed out by Hertzman and Boyce (2010), social causation is a non-linear process.³ In short, there is no guaranteed linear relationship from the hypothetical “universe” of probabilistic environments (A) to the “universe” of actualized risk outcomes (D). This means that some degrees of impoverishment or enrichment must be located in the transaction between the two (i.e., B and C).

The final path in the model could also be considered as the beginning. The behavioural, symbolic, and communicative output from the individual response (C), returns to give input, however slight, into the drivers of the environmental processes (E). En masse, these inputs (i.e., human action and communication) represent the development, maintenance, or decay of culture and social structure. In modern technological society the subsequent outputs (i.e., the drivers) take shape as complex sociocultural patterns and forces that extend through hierarchies; therefore a theoretical discussion of them is necessary.

³As Hertzman and Boyce (2010) put it: “Adverse social conditions yield broad, pluripotential pathogenicity rather than focal, specific morbidities, whereas salutary social environments tend to diminish liabilities to multiple diseases” (p. 331).

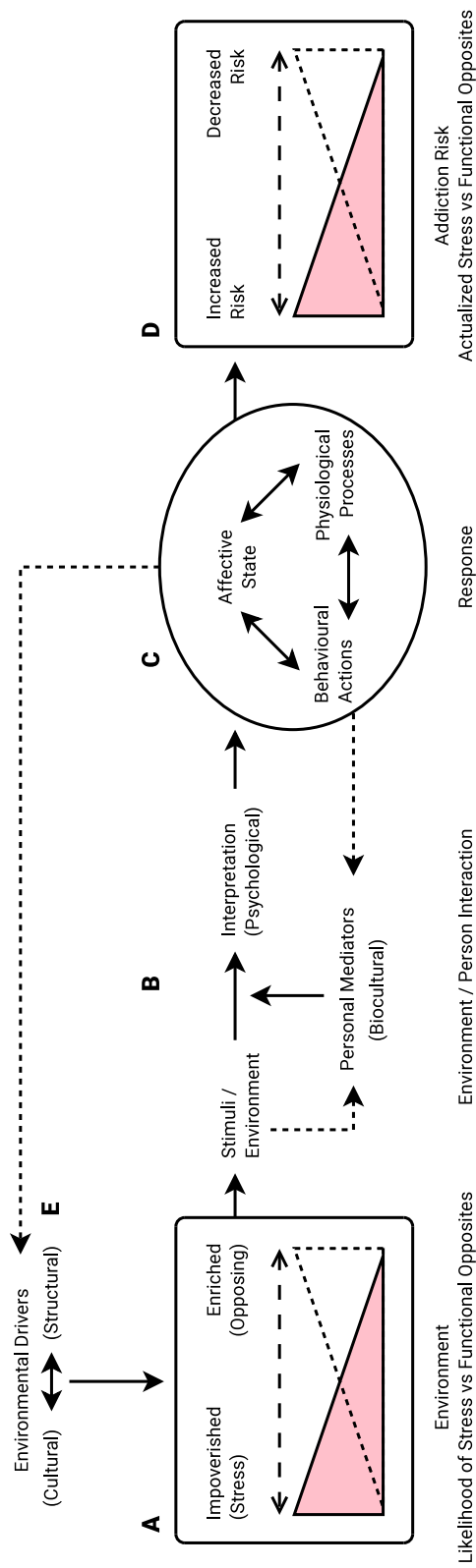


Figure 2.1
BPS addiction and stress model

Sociocultural

The general lack of social level theorizing when a BPS foundation is employed is not due to a paucity of social theory in academia; it is rather the consequence of medical and clinical commitments to particular epistemological positions, from which methodologies and patterns of knowledge acquisition are derived (somewhat analogous to the “mindlines” of clinicians described by Gabbay & le May, 2004). Anthropologists, emphatic in their call for attention to lived experience, have long grappled with the meaning of culture, while sociologists have often struggled with society more or less as a whole.⁴ There are subsequently many ways to understand both society and culture, and many ways to conflate the two, potentially leading to conceptual difficulty (Rohner, 1984). Following the success and promise of recent work on stress and culture (Dressler, 2007), and in keeping with Engel’s original hierarchical system, culture is analysed here as a unique level.

Cultural theory

Defining culture

Ethnographic immersion, the quintessential anthropological method, informs us that culture is something which we learn and acquire. Moreover, by learning it from interactions with multiple people, it must be something that we share. The anthropologist’s slow transition from cultural outsider to insider reflects a change in personal understanding as their interpretations of social life, and their own relationship to it, are instilled with new meaning. Such a transition could only take place if regularities in the meanings of symbols (in the broadest sense) were experienced, and culture can therefore be viewed as myriad systems of acquired and shared symbolic meaning (Rohner, 1984). These shared systems on the whole form a highly complex and diffuse network that is in a constant state of flux.

However, latent in the shared meaning perspective is a tendency towards a monolithic and reified view of culture that exerts influence on, yet somehow transcends, the individual (a fault in much descriptive ethnography, according to Rohner, 1984). The cognitive anthropological model (see Dressler, 2007) captures the shared essence of culture, while still locating it within the individual. In effect, culture is viewed as both aggregate and singular: Cognitive models of cultural domains are assumed to be distributed amongst a given social group in some unknown way, with cultural domains representing anything that the social group shares an understanding of. For example, the shared understandings of what constitutes a good life might be termed a “life success” domain. The task then is not only to identify relevant cultural domains, but to investigate the contents of shared models, their state (e.g., contested or well established), and their distribution within and across groups (e.g., strong or weak).

⁴While this is an over-simplified depiction of the two disciplines, the comparison is not entirely unjustified.

The cognitive approach to culture has a number of benefits that make it particularly useful inside a broader systems theory approach: It (a) empirically connects culture with individuals, allowing for comparison with biological and psychological variables; (b) makes few assumptions, allowing for small culture (narrowly distributed subcultures) and big culture (broadly distributed society-wide); and (c) avoids the false notion that culture is relevant only for minority groups, when in reality it permeates all social action (López & Guarnaccia, 2000).

Culture and stress

The relationship between culture and stress is necessarily complex, but it is clear that culture can alter the likelihood of stress in social groups, which in turn can increase the potential for addiction (and difficulty in treatment). Culture not only influences behaviour (both stress producing and coping behaviour), but provides ways of understanding the self in relationship to others and to the broader environment. Without shared cultural models, social integration (Berkman, 1995) and coordinated social action in general could not occur.

The relationship of the self to others seems to be a particularly important aspect of culture and stress. In examining this relationship, Dressler, Balieiro, Ribeiro, and dos Santos (2007) have operationalized *cultural consonance* as “the degree to which individuals, in their own beliefs and behaviors, approximate widely shared cultural models” (p. 195). Cultural consonance can be measured on any culturally salient domain, and low consonance in the domains of material lifestyle and social support has been associated with increased biological and psychological stress in the United States (Dressler & Bindon, 2000), with replications in Brazil (Dressler et al., 2007) and the Bolivian Amazon (material lifestyle only; Reyes-García et al., 2010).

Cultural consonance can mediate stress (and hence allostatic load) independently of traditional SES measurements such as income and educational status. Thus there is evidence that living out of step with perceived cultural norms is a chronically stressful experience. Quite strikingly, in the Brazilian study (Dressler et al., 2007) the significant association between SES and stress found in a multiple regression analysis was reversed by including two cultural consonance measures (social factors and food). By taking these important Brazilian cultural factors into account, SES actually shifted from a negative to a positive association with stress. The interpretation offered by Dressler is grounded in the context of historical economic changes that were negatively affecting the Brazilian middle-class; however, the result itself highlights the importance of taking culture into account.

Cultural consonance and addiction

Although cultural consonance and addiction have not yet been studied directly, Reyes-García et al. (2010) did compare cultural consonance with the consump-

tion rates of potentially addictive substances amongst the Bolivian Tsimané. The Tsimané are an Indigenous people whose society has maintained self-sufficiency and cultural tradition to some extent despite Western influence. Longitudinal sampling ($N = 791$) revealed that low cultural consonance in Tsimané lifestyle was associated not only with increased frequency of negative and stressful emotions (anger, fear, and sadness), but also with increased consumption of commercial alcohol.

Interestingly, the Tsimané also produce a home-brewed alcohol called *chica*, the use of which is well integrated into the culture. *Chica* is found in Tsimané myth and legend, and is utilized in a structured communal setting (Reyes-García et al., 2010), whereas commercial alcohol is usually drunk alone or in small groups. High cultural consonance for lifestyle is associated with the drinking of *chica*, as well as *decreased* frequency of negative emotions—precisely the opposite of the associations seen between low cultural consonance, commercial alcohol use, and negative emotions.

While it is difficult to establish definite causality from the relationships in the Tsimané study, it is quite revealing that two variations of the same basic material substance (i.e., alcohol) can be linked with such different outcomes. In the search for an explanation, the cultural model of addiction (as described by Singer, 2012) may offer insight into the apparent paradox. Ethnographic research with the Camba (a Bolivian mestizo people) demonstrated that the consumption of large quantities of alcohol could occur society-wide without addiction and abuse—provided that there was a meaningful and strong cultural context within which to contain the experiences. It is worth quoting at length from Singer (2012) regarding the fate of the Camba:

Notably, over time, even Heath came to recognize that among the Camba patterns of drinking began to change, as their traditional way of life became untenable when the local forests were cut down to gain profit on the global lumber market. As a result, many Camba were dispossessed of their land and with it their customary way of life. At the same time, the Camba horticultural economy was “displaced by the illegal trade in coca and cocaine paste”[...]. In short, Heath’s work, and that of other anthropological contributors to the cultural model, suggests that while routine heavy drinking without signs of addiction still occurs, it tends to be in settings in which traditional community social life has not been penetrated fully and disrupted by the forces of capitalist globalization. (p. 1749)

Further research is required to determine how well this might fit with the emerging drinking patterns amongst the Tsimané of low cultural consonance. However, Godoy et al. (2010) have reported the suggestive result that Tsimané consumption of commercial alcohol, commercial tobacco, and coca leaves is increasing along with the opening up of trade. At the same time though, no

associations were yet found between trade opening and increases in anger or stress; a result explained by Godoy et al. based on: (a) the unusually high degree of autarky maintained by the Tsimané, and (b) the retention of core cultural models.

This perspective on self-sufficiency and cultural stability raises some important points about addiction and stress in modern societies. Drug subcultures rise and fall over time in an evolutionary pattern (Golub, Johnson, & Dunlap, 2005), and although the origins of particular drug subcultures vary, they are often connected to broader macro social forces that are rooted in inequality. In some inner-city United States populations where school dropout rates are excessive (potentially upwards of 50%), and where incomes rarely exceed \$25,000 per year (Dunlap & Johnson, 1992), maintaining consonance with the dominant culture is simply not possible. Unlike the Tsimané, these populations are cut off from the means of production, and they do not possess the economic or cultural capital needed to transform their collective situation.

Drug subcultures can therefore be seen as adaptive cultural responses to unyielding structural realities. The combined stress of hardship and low cultural consonance can in part be ameliorated by cultural consonance within a drug subculture. This analysis is supported by ethnographic reports describing, in different turns, crack dealers viewing themselves as prestigious (Soloway, 1974) or as the family breadwinner (Bourgois & Schonberg, 2009; Dunlap & Johnson, 1992), the perceived pressure to belong to street culture (Golub et al., 2005), and the daily “hustle” activities of heroin addicts providing a “sense of purpose and meaning they could not achieve in conventional society” (Golub et al., 2005, p. 224).

Although there is far greater potential for cultural analysis with respect to addiction and stress than is presented here, the examples provided demonstrate a theoretical path that connects individuals, culture, stress, and addiction in a way that is congruent with the underlying systems theory approach. As the methods of that approach rely on combining biological, psychological, and anthropological techniques, the cognitive theory of culture represents an improvement over culture used as an ostensibly explanatory, yet vague and non-specific concept. However, as culture cannot be separated from the social structure within which it evolves, the final step is to consider addiction from a social structural perspective.

Sociological theory

According to Leatherman and Goodman (2011), critical medical anthropology begins with “an explicit recognition that health disparities emerge from social inequalities” (p. 43). In the field of drug addiction, most social level analyses have followed this line of reasoning, and on fair grounds: Substance abuse is far more likely to occur in the lowest income brackets, and even more so when combined with the lowest amounts of formal education (McEwen, 2000). Dunlap and Johnson (1992) directly link addiction with macro-economic forces and rising stress in American inner-city areas (and see Bourgois, 2011). While

these approaches elucidate the social causes that are often inseparable from drug addiction, they are seemingly at a loss to explain gambling addiction, Internet addiction, addictive buying, or overeating to the point of obesity and beyond. Moreover, they cannot explain why drug addiction still occurs even in the absence of material poverty and hardship.

Based on biological understanding, almost all addictions will revolve around activation of the reward pathways. Although the allostatic model can account for non-drug addictions (Koob & Le Moal, 2008), the BPS stress model outlined in the present chapter makes the situation even clearer: Dysregulation in the stress (or antireward) system does not need to be entirely caused by the addictive behaviour—drug or otherwise. If the person-environment interaction in its sociocultural context is stressful, then the motivation for greater rewards precedes addiction. Subsequent repeated activation of the reward system via the behaviour of choice will initiate the opponent-process adaptations and allostatic dysregulation, bringing about the cycle of addiction. Impoverished environments, being the functional opposites of enriched environments, greatly increase the probability of this occurring. The task of social analysis then is to uncover those general processes that create either impoverishment or enrichment.

Psychosocial dislocation

Bruce Alexander's theory of dislocation (Alexander, 2000, 2008) connects directly with the concept of impoverishment, and provides a way of understanding addictions across the social gradient. Dislocation hinges on the Eriksonian concept of psychosocial integration, which broadly refers to our attempts (from childhood onwards) to form meaningful relationships with others. Psychosocial integration leads to a flourishing of the human being that provides a sense of identity and place in the world. Dislocation is the failure to achieve psychosocial integration; an existential isolation that is difficult to endure. Sources of dislocation are varied. For example, adolescent homosexuals who are subjected to abuse and ostracism are at a much higher risk of suicide (Remafedi, French, Story, Resnick, & Blum, 1998). It is not surprising then that in this group, at least in 1994, there was also an exceptionally high risk for substance abuse (Savin-Williams, 1994).

While dislocation has many causes, Alexander asserts that free-market societies produce in citizens, to greater or lesser degrees, a type of dislocation that is universal (Alexander, 2008). This universal dislocation is represented by a breakdown in traditional cultural domains such as the family, community, and religion (Alexander, 2000). Such a notion of dislocation links failed psychosocial integration with Karl Polanyi's claim that free-market mechanisms subordinate "the substance of society itself to the laws of the market" (1944/2001, p. 75). The substance of society consists of people, their culture, social institutions, and the broader environment (including the natural and transformed technological world). For example, the subordination of Indigenous societies to the logic of the free-market results in the breakdown of shared cultural models and social

structures, followed closely by the proliferation of addictions; excepting perhaps cases where interaction with the market is achieved from a position of power, thus maintaining core cultural models and social structures (e.g., the Tsimané; Godoy et al., 2010). The idea that dislocation and addiction are connected to free-market societies is supported by observations that addictive buying, very much a culture-bound syndrome, is increasing with globalization (Benson & Eisenach, 2013).

In terms of the previously outlined model (figure 2.1), universal dislocation is represented by high probability impoverished environments (A). Dislocation itself is the equivalent of a person-environment interaction (B) that tends towards the high stress and addiction risk end of the scale (D). Critically, this does not rely on material impoverishment, although that is undoubtedly a contributor to addiction severity (and probably explains why the lowest income and education brackets feature some of the strongest forms of addiction, such as drug addiction; McEwen, 2000). The drug subcultures described by Golub et al. (2005) represent attempts at psychosocial integration within materially and socioculturally impoverished environments.

While Alexander's critique carries a great deal of practical force in the context of globalization, it does not directly explain the proliferation of addiction in modern, but non-capitalist, forms of society (e.g., the Soviet Union). It would be desirable then to provide a theoretical account of the generalized social processes that produce dislocation, stress, and addiction. One possible description of these generalized processes will constitute the final component of a critical BPS theory of addiction.

Critical social theory

The social theory I propose to account for Alexander's universal dislocation proceeds from Jürgen Habermas' distinction between the *lifeworld* and *system* (Habermas, 1987). The lifeworld-system theory cannot be comprehended apart from the theory of communicative action (Habermas, 1984), and its explication requires departures that are, in isolation, unrelated to addiction. However, once combined, the theories have much to contribute towards understanding the social nature of addiction in modernity. The major concepts will therefore be presented, followed by some brief reflections on their connection to universal dislocation and addiction.

Communicative action The theory of communicative action aims to describe how social order is achieved, principally via language and communication. The first type of action that can occur is instrumental action, which is non-communicative and non-social; it is concerned primarily with means and ends. Then there is social action, where Habermas makes a distinction between two basic kinds: strategic and communicative. In the former, action takes an "objectifying" stance and is intended to causally influence another for some utilitarian purpose (i.e., it is success-oriented, much like instrumental action;

Fultner, 2011). Communicative action meanwhile does not aim at the furthering of purposive goals, but rather takes an “intersubjective” stance that is oriented towards a process of mutual understanding.

For Habermas, the realization of mutual understanding is the primary aim of language, simply because language itself would not be possible without it. The *illocutionary* force in language declares the communicative actions of speakers, and is separated from the *perlocutionary* force that produces effects in the listener. Illocutionary acts must be self-evident (i.e., not require interpretation), as communication could not otherwise take place. For example, it is the illocutionary force of uttering a promise (i.e., the understanding that the speaker is bound to some action) that enables the perlocutionary effect for the listener (e.g., satisfaction and trust) to exist. The chiefly perlocutionary use of language for strategic action is therefore “parasitic” on the illocutionary use of language aimed at communicative action (Fultner, 2011). Society could not function based on purely non-social instrumental action or strategic action, as it would be impossible to establish the shared meanings and understandings required for sociocultural integration.

The distinction between strategic and communicative action attempts to formally locate rationality within communication itself. Habermas tries to show that reason (e.g., how a rational person thinks and acts) is not a concept existing outside of social context, but rather is determined in society by the actual communicative practices of people. Although rationality is traditionally a problem of philosophy, some experimental support for the theory has been found in cognitive neuroscience. Schaefer, Heinze, Rotte, and Denke (2013) carried out fMRI scans on participants who were guided to think about fictitious (but real-world) scenarios using either communicative or instrumental reasoning. They found that communicative reasoning activated brain pathways traditionally associated with “moral sensitivity and prosocial behaviour” (p. 4). Conversely, instrumental reasoning saw reduced activation of these areas along with decreased activation of emotional processing (even when compared with a neutral control condition); suggesting an active suppression of both emotional involvement and social consideration when engaged in instrumental reasoning.

Lifeworld and system The lifeworld-system dichotomy is a means with which to conceptualize modern societies, and is inseparable from the theory of communicative action (although it has roots in Talcott Parsons’ AGIL systems theory; Heath, 2011). The lifeworld is primarily the domain of communicative action (and hence mutual understanding), and it forms the “background” of everyday life and the sociocultural system. It is the location of the shared meanings of the cultural system (e.g., models of beliefs, values, and norms), and is mediated through social institutions such as the family, education, or religious organizations. The lifeworld is reproduced throughout society, within people, via communicative action. In a sense the lifeworld represents the qualitative aspect of

society, and is largely the domain an anthropologist would attempt to understand by long-term ethnographic methods; therefore it cannot be directly understood “from the outside”.

The system on the other hand, is primarily the domain of instrumental action, and it is required for the material reproduction of society (as opposed to symbolic meaning reproduction within the lifeworld). It is the objective or quantitative part of society that operates through non-communicative *steering media*, such as money and power. Since the system is not based on communicative action, it cannot truly generate meaning and legitimacy; that must come from the lifeworld. It is therefore parasitic on the lifeworld, in much the same way that strategic action (with the perlocutionary use of language) is parasitic upon communicative action (with the illocutionary use of language).

According to Habermas, the crisis of modernity (and the source of much social pathology), is the *colonization* of the lifeworld by the system (Habermas, 1987; Heath, 2011). In simplistic terms, this means a reduction in the possibility for communicative action to determine lifeworld processes, as the lifeworld becomes increasingly rationalized by money and power forces. The fatal flaw with this process is that the system cannot generate legitimacy; therefore it has nothing inherently meaningful to replace the lifeworld with. As the subjective aspect of society, the lifeworld could perhaps be perceived as the spirit of society, or its *raison d'être*, and the symbolic reproduction of it depends on communicative action. The curtailing of communicative action leads not only to legitimization crises (e.g., about whether the democratic process actually serves community interests, or primarily money and power interests), but also to social pathology as the “raw materials” of the lifeworld, upon which the human psyche depends, cannot be reproduced through legitimate means.

Reflections

The primary mechanism by which free-market societies produce universal dislocation can be understood as the colonization of the lifeworld by the system. Colonization implies a failure of sociocultural reproduction based on communicative action, being instead replaced by success-oriented goal-driven systems directed via instrumental and strategic action. The most radical historical examples of this in action are the assimilation policies of colonial settlers in places like Australia and Canada. Kew writes about the Indigenous Canadians:

Although Canadian Indians had a taste for “firewater” from the time that Europeans introduced it, it was only during the attempted assimilation that alcoholism emerged as a crippling problem for the Indian people, along with suicide, domestic violence, sexual abuse, prostitution and so forth. [...] The Indians were dispossessed of their lands without great violence, but assimilation began immediately and, with it, rampant alcoholism. (as cited in Alexander, 2000, p. 515)

In the same article, Alexander writes of an addiction-plagued Vancouver having a culture “smothered in its infancy” by American films, music, fast food, television, and so on. Across society, the increasing incursion of system-driven mass media into the lifeworld breaks down the possibilities for legitimate culture. Traditional cultural systems begin to dissolve, and psychosocial integration is attenuated as the value-commitments of the lifeworld become replaced with system-driven consumer identities. The system imperative of consumption, as expressed in the mass media and driven by the instrumental and strategic action of advertising and media production, becomes ever more ruthlessly and scientifically efficient in its goals: The psychological methods of influencing purchasing begin to tie products with personalities and lifestyles, and they come to define life success and myriad other cultural domains that become fundamentally divorced from communicative action. This produces a sense of isolation in society because there is scant communicatively agreed upon culture to integrate with. Recalling the EE paradigm, isolation results in stress and increased addiction potential (although human beings also require cultural and psychological integration for meaningful social exchange, not just proximity to others).

It is not only culture, but also social institutions that can become colonized. The process of juridification occurs when the legal system decouples from the lifeworld. This means that justice, increasingly driven by steering media, becomes concerned more with the abstract logic of formalized law whereupon the values of the lifeworld are slowly excised from the justice system.⁵ The result is a more and more Kafkaesque world where people adapt themselves to serve the system, instead of the reverse. Burns and Fruchtel (2012) discuss colonizing forces in social work, where despite efficiency increases, social work fails to foster social integration because of legal and monetary system imperatives. The net psychological result of such juridification or bureaucratization is a feeling of social helplessness or senselessness, and the effect of one’s life work imparting a sense of futility and meaninglessness ought not be underestimated (i.e., it is a form of impoverishment). Once again, this parallels findings from the EE paradigm where reduced freedom produces stress and addiction potential, although from a human point of view such a reduction is better described as existential rather than physical (despite the fact that there are necessarily effects at the biological level).

Summary: Critical biopsychosocial addiction theory

To recapitulate from the biological to the social: The colonization of the lifeworld represents the increasing probability of environmental impoverishment as it becomes encoded biologically, psychologically, culturally, and socially. While impoverishment or enrichment can lie in the external environment, they can also be embedded within human bodies and communicative systems. The critical BPS

⁵Although see Ingram (2010, pp. 275–276; footnote 4) for a more nuanced discussion of Habermas’ conception of juridification.

approach outlined in this chapter introduces a plausible synthesis that situates the modern understanding of addiction as a brain disease inside a web of causality that extends beyond, yet returns to act upon, the individual brain.

One of the central ideas underlying this chapter is the reinterpretation of the BPS model as a vehicle with which to engage in meaningful interdisciplinary communication regarding addiction, while remaining rooted as firmly as possible in empiricism. By employing the linking concept of stress, connections between theories of addiction at multiple levels of analysis are made visible: The neural opponent-process theory of addiction, environmental enrichment, allostatic load, psychosocial dislocation, cultural consonance, and system-lifeworld theory are not incompatible, and together provide an explanatory force that is less evident when each is considered in isolation.

Many interesting questions arise from the synthesis presented. For instance, what does cultural consonance mean in highly systematized cultural domains? Can consonance itself be a source of stress and dislocation? What are the true social, cultural, and by extension medical burdens wrought by the invisible encroachment of “free-trade” market logic into all facets of life? How accurate and effective can purely biological or psychological understandings of addiction be if they are disconnected from discussion and philosophical reflection about the nature of the social substrates within which minds and bodies grow (Malabou, 2008)?

Despite the broad aims of this chapter, an obvious omission is the lack of attention paid to addiction vulnerability in the genome, but there is no reason why it could not be included to further understand outcomes for individuals (see Shaffer et al., 2004). Addiction as a consequence of the processes described in this chapter should be more likely to occur in those with an apparent genetic vulnerability (which must still be contextualized; Lock, 2012), while different adaptations may be more likely in others. Furthermore, only cursory discussion was made at the psychological level regarding individual life history, trauma, abuse, and so on. While these factors are obviously important to understanding addiction, particularly in a therapeutic setting, in this chapter they have been subsumed under a general understanding based on stress. This highlights the need for a probabilistic view of social forces and the difference between social and cultural tendencies and the actualized complexity of a given individual’s life and circumstances.

2.4 Conclusion

The proliferation of addictions continues apace, particularly so with the spread of globalization. Sussman et al. (2011) reviewed 83 studies where sample sizes exceeded 500, and found it most likely that 47% of the United States adult population suffered from signs of a maladaptive addictive disorder over the period of a year. In the face of such bleak results, Sussman et al. conclude that addiction

might simply be an unavoidable facet of human existence. Given that historical anthropological evidence demonstrates this claim to be false, I hope that the critical pragmatic approach outlined in this chapter might provide some utility towards understanding why addictions in the globalizing world are increasing in prevalence and taking on novel forms; perhaps even assuming the guise of normality in some cases. On the contrary, in much the same way that changes in gene expression and neural structure are biomarkers for addiction at the individual level, the incidence and severity of addiction in society are markers of sociocultural pathology.

I suggest that almost any addiction treatment centre in the modern world is managing patients who are, to greater or lesser degrees, operating within this context of globalization and sociocultural pathology, and Takiwasi is no exception. While this chapter has laid the foundations for understanding addiction in the modern world, discussion of the implications and how they might pertain to addiction treatment (and Takiwasi specifically) are reserved for the final part of this thesis. Before Takiwasi can be considered in relation to the overarching theoretical framework, the centre itself (and especially its cultural and historical context) must first be presented and explained.

Part II

Takiwasi

Cross-Cultural Medicine: Interdisciplinary Views

Synopsis The Takiwasi approach to addiction treatment is bound up in dualities. On the one hand they employ traditional medicines and maintain views drawn from Amazonian indigenous heritage, yet on the other hand provide psychotherapy and allopathic medicine whilst maintaining the structure and culture of a modern organization. The content of this chapter mirrors that dualism, as it revolves around reviewing the relationship of Takiwasi's treatment modality to both tradition and modernity. My intention is to provide the sceptical reader with sufficient information to place Takiwasi's claim of cross-cultural medical legitimacy (in this case, the capacity to heal using a syncretic Western-indigenous framework) within a social, historical, and scientific context.

Despite the near universal prevalence of culturally integrated forms of sacred consciousness alteration within traditional societies (Bourguignon & Evascu, 1977), no such integration exists within Western societies. On the contrary, within secular societies driven by technological and scientific rationality, the very notion of the sacred is devalued and treated with suspicion and scepticism. Thus for the Western reader, the therapeutic practice of providing psychoactive substances under sacred ritual conditions may appear to be incomprehensible without an anthropological perspective, and of dubious value without a scientific perspective. In concrete terms, I suggest that an informed academic discussion of Takiwasi requires prior knowledge of: (a) traditional Amazonian medicine as it is practiced by Peruvian *mestizos* (i.e., people of mixed race, particularly in the context of Spanish colonization in South America); (b) current neo-shamanic movements; (c) the history and state of scientific knowledge regarding psychedelic therapy; and (d) the relationship between ayahuasca and addiction.

3.1 Traditional Amazonian Medicine

The term *traditional Amazonian medicine* represents an extremely broad category that is difficult to define accurately given its roots in shamanic practice, which includes a wide range of actions beyond healing and has a history in South America that stretches back into pre-Hispanic times. It is probably fair to say that the essence of shamanism is found in an interaction with a putative world of spirits, engaged with for some magico-religious purpose. This apparent access to a world of spirits is often (but not always) induced through some type of altered state of consciousness, or what Mircea Eliade called “techniques of ecstasy” (Eliade, 1951/2004). More generally, shamanism is “a body of techniques and activities that supposedly enable its practitioners to access information that is not ordinarily attainable by members of the social group that gave them privileged status” (Rock & Krippner, 2011, p. 1). While the precise nature of ancient Amazonian shamanic practice has been obscured by time, there is archaeological evidence of the ritualized use of psychoactive plants such as coca and tobacco stretching as far back as 2,000 BC (Naranjo, 1979).¹

It is sometimes claimed (or assumed) that traditional medicine has continued more or less unaltered since antiquity, although this is unlikely to be accurate except in a general sense regarding shamanic activity and the use of psychoactive (and other medicinal) plants. There are ethnographically and historically documented changes and evolutions in traditional medicine that have occurred at various points in time, usually in response to social, cultural, or economic developments or upheavals (which have been numerous in South America). Freedman (2014), while focusing mainly on the current changes, also acknowledges the continuity:

Since the 1970s, however, the contours of shamanic practice in western Amazonia have become increasingly shaped by distant sponsors and clients in a process centered on the use of ayahuasca. [...] Yet a remarkable continuity in both ontology and praxis since pre-Hispanic times, in the Andes and in the Amazon region, also needs to be accounted for. (p. 130)

The evolution that is most relevant to Takiwasi is the emergence, amongst mestizo people, of *curanderismo* (i.e., folk healing), or even more specifically, Peruvian *vegetalismo* (a form of herbalism). Labate, Cavnar, and Freedman (2014) define *vegetalismo* as:

An urban healing tradition based on indigenous ayahuasca shamanism in Western Amazonia, spread among mixed forest and urban

¹There is evidence for the use of peyote in Central America around 3,700 BC (and possibly much further back; El-Seedi, Smet, Beck, Possnert, & Bruhn, 2005). Similar evidence also exists for psychoactive plant usage in the Old World (Merlin, 2003).

populations around the main Peruvian Amazonian towns of Iquitos, Tarapoto, and Pucallpa throughout the twentieth century. (p. 6)

The term *vegetalismo* then refers to a particular subset of the broader world of traditional medicine, although in practice it may now be difficult to separate out just what is indigenous and what is mestizo (Labate, 2014). Regardless, Takiwasi, although situated on the outskirts of Tarapoto (on a dirt road that connects the city to La Banda de Shilcayo), is an urban centre. While the large grounds are filled with a variety of jungle trees, plants, flowers, and vines which provide a peaceful and natural feel, it is embedded in a small but noisy city with an estimated population of around 144,000 people (2015 projection; Instituto Nacional de Estadística e Informática, 2012). One can take a motor-taxi from the city centre to Takiwasi for a minimal fare. On the wall inside the *casa principal* (main house) are pictures of important *curanderos* (predominantly Peruvian) who have worked at Takiwasi or who have been *maestros* (teachers) of the current healers. Although the notion of indigenous Amazonian medicine contrasted against Western medicine is not completely invalid, the actual situation is more complicated. In an interview I asked Jaime Torres about the teachers on the wall:

David: In the past were there a lot of indigenous teachers in Takiwasi?

Jaime: No, mestizos. I saw only mestizos. Although Jacques has contacted some indigenous healers. [...] But an indigenous healer–

David: Can't get to the city?

Jaime: No, doesn't leave, doesn't leave his village. They don't like the city. They don't like the people.

Many of the most important healing techniques used at Takiwasi, at least on the side of traditional medicine, can be located within the mestizo tradition of *vegetalismo*. Although there are a number of plants which are considered to be very important, ayahuasca has come to the forefront of *vegetalismo*, and it has been the most frequently studied academically as well as having generated an unusually large amount of occidental interest (when compared with other important traditional plant preparations). Takiwasi is itself most well-known for the therapeutic use of ayahuasca, and a brief overview of the historical developments in ayahuasca usage will help to demonstrate Takiwasi's association with *vegetalismo*.

The traditional uses of ayahuasca

In modern times, the word ayahuasca has come to mean a decoction using the parts of at least two plants; the vine *Banisteriopsis caapi* (itself traditionally called ayahuasca, referred to here as *caapi* for clarity; Räscher, 2005, pp. 86–88) and the leaves of *Psychotria viridis* (locally known as *chacrana*; Räscher, 2005, pp. 456–457) or *Diplopterys cabrerana* (Räscher, 2005, pp. 220–221). It is difficult to be

precise about the extent to which this mixture was used historically, but from an ethnobotanical point of view, the use of caapi by geographically dispersed groups was confirmed by Richard Spruce in the 1850s (Schultes, 1987; Spruce, 1908/2005). In the historical record, seventeenth century writings by Jesuit priests make note of the indigenous use of caapi, with their understanding being that the natives were using it to forge alliances with the Devil (Luna, 2011).

Luna also provides an overview of the traditional uses of caapi, which were not limited to healing but included divination, warfare, maintenance of social relations, hunting and agriculture, initiation ceremonies, and religious experiences. Schultes (1982) made its overarching importance clear:

Nor perhaps has any other β -carboline plant captured so intimately and irrevocably a place of such all-pervading potency in the life and death of the South American peoples who reverently value it as a medicine, hallucinogen and sacred element that permeates, in their concept, all of Creation [...] *Caapi* truly enters into every aspect of living. It reaches into prenatal life, influences life after death, operates during earthly existence, plays roles not only in health and sickness, but in relations between individuals, villages and tribes, in peace and war, at home and in travel, in hunting and in agriculture. In fact, one can name hardly any aspect of living or dying, wakefulness or sleep, where caapi hallucinations do not play a vital, nay, overwhelming, role. (p. 206)

The caapi vine contains reversible monoamine-oxidase inhibitors (amongst other psychoactive alkaloids) which makes it an excellent carrier for potentiating the effects of other plants when used as admixtures (for a listing see Rivier & Lindgren, 1972), and in this sense the vine is the fundamental unit of ayahuasca. Schultes, commenting in 1987, wrote that “a large number of plant additives are frequently used with the basic malpighiaceae drink”, but that chacruna leaves were added “occasionally” (p. 90). Luna (2011), citing Reichel-Dolmatoff and others, makes a case for two kinds of caapi rituals (which does not imply that all caapi use was ceremonial or shamanistic; see Rodd, 2008; Schultes, 1982). The first were collective life cycle and ancestor communication ceremonies which featured musical instrumentation emphasizing “the divine origin of their social laws” (Luna, 2011, p. 8). While these collective rituals were strongly embedded in the general social fabric (Spruce, 1908/2005), the second kind of ritual was for specialist purposes such as healing or divination, and these rituals were limited to a smaller number of people who made use of caapi with various admixtures (and see Brabec de Mori, 2011, p. 28).

According to Luna (2011), the collective caapi ceremonies gradually became scarce as a result of missionary activity and Western influence, although it appears that the specialized use of caapi with admixtures has survived. This makes sense within the context of colonialism, as social kinship bonds are eroded and

individuals become more subject to market forces and urban life. The specialized shaman or healer can thereby survive by providing services to relatively unknown individuals for monetary exchange (even if by donation). There is some evidence to suggest that the dominance of the modern ayahuasca brew (the word now virtually signifying the mixture of *B. caapi* and *P. viridis*) is a relatively recent phenomenon (Brabec de Mori, 2014; Shepard, 2014). This of course does not mean that the mixture of caapi and chacruna is new per se, but rather that its widespread adoption may be.

The expansion of European colonization during the rubber boom period of the late 19th and 20th centuries was an important impetus for the spread of vegetalismo and the modern ayahuasca mixture in Amazonian regions (Gow, 1994), perhaps in part because it was a more effective means for conducting shamanic work during a time of great turmoil for indigenous and mestizo people (Llamas et al., 2016; Luna, 1984a). Dobkin de Rios and Rumrill (2008a) write of the poor conditions for Indigenous Peruvians even in the 1960s, as well as an early need for secrecy around folk medicine:

[During the 1960s], Cordova-Rios was one of the few mestizo shamans in [Iquitos]. At the beginning of the twentieth century, shamanism and folk healing were practiced by indigenous peoples—almost clandestinely, in the rural zones among small river-edge towns. If an indigenous person practiced shamanism in the city, it was done in the periphery, in marginal zones where the poor habitually lived. Indigenous people were and continue to be the poorest among the poor. (p. 35)

The fluidity of shamanic traditions (particularly in the face of adversity), is evidenced not only by the spread of ayahuasca use to urban mestizos, but by the very existence of traditional medicine in urban areas post-colonization (in the form of vegetalismo, although there are other extant forms). The initial colonial contact with the indigenous “devil worshippers” did not result in the complete destruction of their practices by missionary activity, but rather led to syncretism and the integration of Christian elements into ritual and cosmology that persist today within the urban tradition of vegetalismo (cf. Taussig, 1984).

Vegetalismo and globalization

Vegetalismo, the tradition most relevant to Takiwasi, is itself borne from adaptation to change. It is the transference, or adaptation, of indigenous knowledge systems and techniques from the jungle into urban life.² From Dobkin de Rios and Rumrill (2008a):

²Although Gow (1994) makes the case for transference in the opposite direction.

Community harmony and cohesion are nonexistent in the city, where social change has proceeded for almost 400 years. The native Amazonian resident has been wrenched out of his tribal lifestyle. [...] The old-time shamanic role has been stripped of its social control mechanism. No longer do adult men and women function to protect the community from its enemies. The state has to be dealt with—the natural government, including police, bureaucracy, social services, the Western medical establishment, and so on. (pp. 31–32)

In terms of *vegetalismo* in Peru, the rate of change has increased in recent years along with globalization and the spread of what is known as “ayahuasca tourism” (or perhaps more accurately, “shamanic tourism”; Fotiou, 2014). This tourism has created the equivalent of a miniature economic boom for shamanic practitioners (Freedman, 2014), which is particularly true in and around the Peruvian city of Iquitos. Perhaps since the early 1990s, increasing numbers of foreigners have been travelling to the Amazon in search of authentic experience with ayahuasca, for varying reasons (Grunwell, 1998). However, the rising Western interest (Hill, 2016; McMahon, 2016; Tupper, 2009) has led to an influx of money into areas with high levels of economic inequality and relative poverty, thereby ensuring the emergence of “ayahuasca business” (Dobkin de Rios & Rumrill, 2008a). This monetary flow might be construed as a boon, since the economic boost could allow for increased development and higher standards of living for some (cf. Brabec de Mori, 2011); but it is important to examine the effects on the *vegetalismo* tradition itself.

Before widespread shamanic tourism, the *vegetalista* was a folk doctor; an alternative when hospital treatment had failed, was unobtainable, or was inappropriate (for instance when a patient believed that he had been subjected to witchcraft). Dobkin de Rios and Rumrill (2008a) describe in some detail Don Hilde, a Peruvian *vegetalista* (now deceased) from Pucallpa who specialized in ayahuasca (otherwise known as an *ayahuasquero*) and whom Dobkin de Rios visited during the 1960s and 1970s. As a prototypical *vegetalista*, his working life was described in the following way:

In his urban practice don Hilde reflected only minimally the heritage of the tribal shaman. He was Christian, although he was not a practicing Catholic or Protestant. [...] From early morning to late at night, living in a large, eight-room wooden shack with no running water or electricity, don Hilde would see men, women, and children who sought his help—people from all over the city, as well as from distant hamlets a few hours away by bus or boat. [...] Don Hilde saw all kinds of patients—from the very young to those destined in Western society for the psychologist, the orthopedic surgeon, or the psychiatrist. He was, in fact, the epitome of a primary care physician. (pp. 29–37)

Don Hilde had an extensive knowledge of plant medicines (well beyond that of ayahuasca alone), and made use of rigorous diet processes (known as a *dieta*), where one lives in the jungle with strict limitations on food intake, social contact, and sexual activity, and thereby “learns” a particular plant by ingesting it over the course of the *dieta* in a state of unusually heightened sensitivity (Jauregui, Clavo, Jovel, & Pardo de Santayana, 2011; Sanz-Biset, Campos de la Cruz, Epiqui  n-Rivera, & Ca  nig  ral, 2008). For Don Hilde, while the origins of illnesses could be either natural or spiritual, there were always evil forces present during an ayahuasca session which necessitated the healer having acquired his own allies (i.e., forces of good) to combat the evil and protect the patients (and himself). Don Hilde “did not advertise his services, and his clients learned about his clinic from recommendations of former patients, or relatives, friends, or neighbors” (p. 39), and payment for his services was by donation. Moreover, the majority of his patients had also visited a medical doctor over the course of the previous year. Thus the livelihood of a *vegetalista* such as Don Hilde would be largely dependent on both his knowledge and performance as a healer, and the subsequent word of mouth reputation formed by accounts of his successes or failures.

As can be seen from the profile of this healer, there was not much cause for excessive competition amongst *vegetalistas*. Aside from the extremely difficult training procedures required for learning the craft, the daily reality of dealing with a steady stream of sick individuals for little profit could not have been overly appealing to most city dwellers (although successful *vegetalistas* would have been valued for their knowledge of plants and healing, so the work was not without reward). The popular discovery of *vegetalismo* and ayahuasca internationally has altered the situation, as travellers arrive in Peru for short stays with comparatively large amounts of money (often with minimal to no spoken Spanish or Quechua), and who are on the whole not seeking the same things as the Peruvian urban dwellers. In fact, the question of what exactly Westerners are seeking in their overseas visits to shamans is debatable, and although no precise answer can be given that will satisfy all cases, some general trends can be discerned. The following quote from Losonczy and Cappo (2014) about Westerners’ understanding of ayahuasca provides some suggestions:

The Occidentals’ perception articulates three representations related to ayahuasca. The first one, linked to the biomedical point of view, sees ayahuasca as a powerful psychoactive substance. The second one seems linked to the idea of ayahuasca being a natural spiritual beverage capable of “opening the way” toward superhuman interlocutors belonging to “another world.” The third sees it as a tutelary feminine spirit, often called “mother ayahuasca” or “spirit of ayahuasca” (*la madre de la ayahuasca* or *el esp  ritu de la ayahuasca*), who communicates with humans in order to heal and teach. Indigenous and mestizo shamans lean closer to the last two representations, more strongly

related to more complex and extensive vernacular cosmologies. (p. 114)

Four motivations can be drawn out from the above representations of ayahuasca: (a) the desire for a powerful psychedelic experience (the psychoactive substance); (b) the desire for an authentic spiritual experience (the other world); (c) the desire to be healed from perceived physical, psychological, or existential problems (the healing spirit); and (d) the desire to learn, have questions answered, or perhaps enter into an ancient indigenous world of knowledge (the teaching spirit). In 2007, Dobkin de Rios and Rumrill (2008a) interviewed 17 participants (from various countries) at a Peruvian ayahuasca centre. Regarding their motivation, they found that “many expressed personal problems, including a lack of direction in life—the most commonly expressed by far. Also, many suffered from depression, anxiety, low self-esteem, eating disorders, post-traumatic disorders, and drug abuse” (p. 99). On the other hand, Kavenská and Simonová (2015) found that almost half a sample of 77 “ayahuasca tourists” expressed “curiosity and a desire for adventure” (p. 353), although aspirations of healing for individual ailments were also featured.

The outcomes of the dislocation and colonization processes described in chapter 2, coupled with what is probably an innate drive for the alteration of consciousness (Siegel, 2005), provide a force to push some Westerners towards shamanic tourism (and ayahuasca in particular). Whatever the personal results for seekers, the economic disparity between the shamanic seekers and the shamanic providers—and the fact that the seekers are inevitably the culturally naive party attracted by the promise of something “pre-industrial, premodern, natural, exotic, spiritual, sacred, traditional, and timeless” (Fotiou, 2014, p. 163)—has had undeniable effects on the vegetalismo tradition. The growth of the financially alluring option of providing for transient and comparatively wealthy tourists creates a market where traditional techniques and knowledge of healing become secondary to a more lucrative performance-based business model. Just what the performance might be depends on what foreigners expect to see and experience (i.e., what their notions of the exotic and indigenous are), and also how powerfully the experience can be delivered, for instance through the profundity of an intense psychedelic journey into the mind and possibly beyond.

Marlene Dobkin de Rios was an outspoken critic of what she called drug tourism (cf. Winkelman, 2005), and the neo-shamanic trends that were associated with it:

If we look in general at the recent spate of neo-shamans, we see that most of these men and women are basically business people who extract cash from visitors. Today, drug tourist clients are not screened and new healers mix together toxic witchcraft plants of the nightshade family with ayahuasca. Most have never been apprentices, nor fasted, nor adhered to special diets that traditional healers typically have used

to enhance their ability to understand the plant hallucinogenic effect. (Dobkin de Rios & Rumrill, 2008a, p. 87)

The issue is not simply one of accepting foreigners or tourists into sessions, but rather an alteration of what is required in order to present oneself as a shaman or healer in the first place. Guillermo Arévalo is a Shipibo curandero who now practices in Iquitos and who caters largely to foreigners; nevertheless he is still considered by those in the area to be a “legitimate healer” (Freedman, 2014). In an interview with Roger Rumrill (Dobkin de Rios, 2005), Arévalo commented on the recent increase in the number of healers (whereas in the past there might have been only one or two per community):

Now in Pucallpa, there is a wave of competition that exists. Many here pretend that they are curanderos, even among indigenous people. In San Francisco de Yarina Cocha[...], in almost every house there is a “shaman” or curandero. They give patients ayahuasca to drink. (p. 205)

While tourist money and interests are certainly not the only forces shaping vegetalismo, there seems to be little doubt that the impact is significant. These are some of the “distant sponsors” that Freedman (2014) refers to, and although Takiwasi is a decades old centre, it is within this social context that it operates.

Takiwasi, tourism, and neo-shamanism

Takiwasi is positioned in a somewhat complicated manner with respect to the tourism and neo-shamanic developments in Peru. There are certain features of the modern changes that apply to Takiwasi, and others that do not. To begin with, the centre’s founder and president Jacques Mabit, who fulfils the dual roles of ayahuasquero and Western-trained medical doctor, while a Peruvian citizen, is neither mestizo nor indigenous. However, for locals ethnicity has little bearing on whether a curandero is considered to be legitimate, as evidenced by Freedman’s discussion regarding Peruvian “road shamans” along the Iquitos-Nauta road (2014).

Perhaps the most conspicuous and hazardous development that Takiwasi’s curanderos are opposed to is the commercial activity of selling ayahuasca visions and “powerful” experiences. In the main house of Takiwasi there are two notice boards; on one side are patient and staff activity plans, while on the other there is a news area featuring occasional letters from ex-patients and their families, notices about conferences and research developments, and anything else that might be of interest. Early on in my fieldwork I saw a cartoon attached there depicting a “shaman” with rattle, pipe, and a few necklaces adorned with dollar signs, along with the statement “Our ceremonies are not for sale”. Although this cartoon was actually part of a satire piece on a New Age shamanism certification program, it struck me as slightly odd since Takiwasi not only treats live-in addiction patients,

but also provides a more general mental health track where foreigners are received at specific times throughout the year for seminars. These seminars clearly are for sale (the prices being available on the website), and they make up a substantial portion of Takiwasi's funding and contribute to their self-sufficiency.

In spite of this, the fieldwork process revealed that admission to treatment (and all those who undertake processes at Takiwasi are considered to be patients) is not solely a matter of commercial transaction. It simply is not possible to arrive and pay, expecting to take part in an ayahuasca session or any other therapeutic activity. This is as true of the addiction track as it is of the mental health track. At a minimum, a medical history must be completed along with a letter detailing life history, experience with psychoactive substances in and out of ritual settings, psychiatric history, and so on. As I discovered firsthand, this information is read and considered, and movement through the system can take time.

Somewhat reminiscent of the profile of Don Hilde, Takiwasi's curanderos do not appear eager to promote themselves or the use of ayahuasca. During an interview the director of the centre, Jaime Torres, put it this way:

Jaime: Precisely because of the rigour that we have regarding the clinical approach to patients, we have never had any health issues. Because we prefer to say “you cannot take ayahuasca” than to say “sure, come and drink, drink! Have your psychedelic flight!”. It is not useful, because we believe that ayahuasca is more than this, and it is better to say “no, you cannot take ayahuasca, you have to prepare first”. This is because we are not a centre for the distribution of ayahuasca. We are not a centre for tourists. We are not a centre for “shamanic tours”. Takiwasi is a health centre. Importantly, it is a health centre with all the associated legality, from the [Peruvian] Ministry of Health, to taxes, through to qualified psychologists and doctors.

I had arrived at Takiwasi expecting ayahuasca usage to be much more dominant within the treatment than it actually is in practice. While utilized on a regular basis, there is no promotion of ayahuasca as a spiritual or medical panacea (as is sometimes the case amongst proponents of ayahuasca). When I asked patients during interviews how they had initially heard about Takiwasi, most often the reply involved word of mouth, or exposure to documentaries found online (e.g., “L'ayahuasca, le serpent et moi”, 2003). By way of comparison, the following is an excerpt from an email I received during my fieldwork (unconnected to Takiwasi) soliciting interest in an ayahuasca retreat located somewhere in Peru:

Times are difficult globally; awakening is no longer a luxury or an ideal. It's becoming critical. We don't need to add more depression, more discouragement, or more anger to what's already here. It's becoming essential that we learn how to relate sanely with difficult times. The earth seems to be beseeching us to connect and to discover

our innermost essence. This is the best way that we can benefit others. [...] Happy 2015! Now is the time to seize the opportunity to come to Peru and experience ayahuasca in a safe, integral and guided retreat. After having worked with dozens of shamans over the last few years, co-facilitators of this retreat, [facilitator 1] and [facilitator 2], have crafted a unique 10-day ayahuasca journey with three of the best and most powerful shamans we have found, that will open, cleanse and empower you on your own shamanic path.

The difference I see with Takiwasi is so not much an issue of charging fees, but of approach and representation. Jacques Mabit, for example, does not subscribe to the view that ayahuasca is necessary or that everyone will automatically benefit from taking it, or indeed that it should be promoted at all. In a presentation at the Multidisciplinary Association for Psychedelic Science (MAPS) conference, Mabit (2013) described a state of excitement where one feels a strong desire to promote ayahuasca as “sospechoso” (suspicious). Jaime Torres expressed a similar sentiment during our interview when he said, “What I do not do is a type of ayahuasca proselytism”, referring to the promotion of ayahuasca through business, networking, and advertising. The usage of ayahuasca within Takiwasi also significantly deviates from the more recent goal of delivering visions for “consumers”, which Freedman (2014) describes:

The urbanization of vegetalismo (mestizo urban shamanism in western Amazonia) consistently called for stronger ayahuasca brews that would have marked purging effects on consumers. More recently, in the face of increasing demand from lodges for brews that would guarantee effects without requiring that people follow the traditional dietary rules before and after sessions, more concentrated brews have apparently become the norm in urban settings. Tourists expect to have visions rather than purge. (p. 143)

In Takiwasi, a desire to have visions without purging would rapidly turn to disappointment. Indeed, if there is a “market demand” for concentrated brews that produce visions with a minimum of the traditional inconveniences for the drinker, then it is explicitly rejected within Takiwasi: The curanderos and psychologists are adherents of the traditional dietary and behavioural taboos that surround the use of psychoactive plants. Adherence to these taboos is not viewed by staff as a matter of cultural performance, but rather as a pragmatic necessity. Such a stance is a consequence of learning from traditional healers. According to Jaime Torres, the mestizo healer Don Solon (who mentored Takiwasi’s curanderos) held that it was prudent to avoid providing foreigners with too much ayahuasca, and even to avoid providing dietas since the people would often break the dietary and behavioural stipulations. Hence Torres also expressed a philosophy of caution with visitors: “The people that come to Takiwasi arrive with an important personal

history; burdened, heavy, in a psychological context, affective, spiritual. So one must take care in the way they are going to use plants”.

The concern for safety at Takiwasi plays out not only in a conservative and traditional approach towards plant usage, but also in a focus on the meaning of visual and psychological material, and the integration of that meaning into daily life. This integration is facilitated through a psychologist, which is clearly not a traditional practice and is an instance of Takiwasi's attempt to combine Western and indigenous methods. There are in fact many areas in which Takiwasi practice is closely linked with traditional *vegetalismo*, and other areas where modern changes are found, being more reminiscent of the “psychologization”, “professionalization”, “scientization”, and “medicalization” processes that Labate (2014) discusses and ascribes to neo-*vegetalismo*. However, while psychological views have been integrated at Takiwasi, they have not done so at the expense of traditional understandings, as one healer lamented of neo-shamanism:

De Rios in 2007 was able to briefly interview one mestizo healer who had worked with don Hilde before his death, who was very angry at the changes he saw all around him. Healing was no longer linked to a philosophy of good and evil, witchcraft and healing. Neo-shamans were taking over and destroying the traditional field of mestizo healing. (Dobkin de Rios & Rumrill, 2008a, p. 28)

Although a fuller discussion of the ontology of healing in Takiwasi is saved for chapter 4, suffice it to say that within Takiwasi a philosophy of good and evil, witchcraft, and healing seems to co-exist alongside an understanding that draws on psychoanalytic concepts, as well as a Western medical understanding of the body. Mabit, now being the principal healer at Takiwasi after decades at the centre, has dined and apprenticed in a traditional manner (J. Mabit, 1994), and Takiwasi appears to balance a genuine commitment to the *vegetalismo* tradition along with a pluralistic integration of Western concepts. While I do not suggest that Takiwasi stands apart from the ayahuasca tourism phenomenon (given that the centre is in part funded by providing to foreigners), it is clear that Takiwasi is differentiated from a business-driven centre given their history, aims, practices, and commitment to a broad view of traditional Amazonian medicine.

The legitimacy of *curanderismo*

On the clinical side, Takiwasi employs doctors, nurses, and psychologists, all of whom have trained in a higher educational system, and most urban dwelling people would have little issue with accepting these forms of professional validation. The situation is less clear when considering Amazonian medicine. The *curandero* is by definition a folk healer; a practitioner of medicine who holds no formal medical title. In general, for modern societies where indigenous cultural ties have been severed, interest or confidence in such healing will be low. Indeed, it is

more likely to be associated with quackery, or at best a kind of psychological manipulation aimed at stimulating the placebo effect.

While Peruvians do not universally accept the validity of *curanderismo*, it remains a strong part of the national culture, though not everyone is treated with equal respect. During my fieldwork in Tarapoto, I often visited a certain inexpensive restaurant and came to know the owner (who was an elderly Peruvian). On one occasion I heard a man on the radio conducting a lengthy self-promotion presenting as a shaman who could heal a raft of ailments, and after some time the owner walked over and turned it off. I asked for his opinion, and he told me that these were con men who would usually just buy plants (which turned out to be ineffective or inappropriate) from the markets for sham healing ceremonies. I wondered then what he thought about Takiwasi and asked for his view, since they too provide plant-based treatment. He thought for a moment and told me that Takiwasi are good (*“son buenos”*), and that they grow their own plants; demonstrating that there are degrees of respect held for *curanderos* which extend beyond a performative “placebo-inducing” model of shamanism. The underlying conception of validity is not strictly biomedical, but is also based on perceived experiential knowledge and relationship to the natural world.

In Peru the use of ayahuasca is legally accepted and regarded as cultural heritage, and according to Labate (2014), Takiwasi played an important role in establishing that state of affairs. But the issue of legitimacy as *curandero* with visitors seems to depend at least partly on locality. Losonczy and Cappo (2014) write that for outsiders, a *curandero*’s trustworthiness depends on origin and that this should preferably be indigenous, which naturally leads to the potential for indigenous identity as pure performance. On the other hand, Fotiou (2014) observed that:

Mestizo shamans who cater to locals wear Western clothes and are Christian. For example, an older shaman, who works from his house in Iquitos and has no lodge in the jungle, always has a picture of Jesus in front of him during ceremonies. [...] I was surprised to see that in one of the most well-known ayahuasca retreats near Iquitos the maestro and apprentices wore Western clothes at all times and never tried to appear more “authentic”. (pp. 168–169)

Takiwasi *curanderos* also largely wear Western style clothing without attempting “indigenous authenticity”, despite the fact that the clientele are largely foreign and that such authenticity is apparently becoming an important performance element for tourists (such that local markets are providing the necessary equipment; Freedman, 2014). But apart from such visual or performative aspects, the question of how to judge the legitimacy of *curanderos* is largely a matter of community consensus based on word of mouth, as there are no formal institutions to certify practitioners, and at any rate the ontological issues surrounding *curanderismo* make this seem infeasible. This difficulty is acknowledged by Mabit, who suggests

personal transparency regarding life trajectory, training, claims of skill, and the conditions and price of work or treatment (Labate, Anderson, & Jungaberle, 2011, pp. 241–243).

Taken as a whole, the aforementioned issues of legitimacy are of relevance to those with a cultural connection to, or personal interest in, *curanderismo*. Yet as these ties are in the majority absent within Western societies, the question of legitimacy then falls onto empirical and scientific evidence. It is fortunate that the use of *ayahuasca* (of significant importance in *vegetalismo*) induces notable alterations in physiology and consciousness, thus making scientific investigations plausible. Moreover, psychology and psychiatry already have a short but intense history of psychedelic research that parallels the therapeutic use of *ayahuasca*. The remainder of this chapter then focuses on reviewing the available evidence for substance-induced consciousness alteration as a valid form of therapeutic intervention, which then leads back to Takiwasi and their use of *ayahuasca* to treat addiction.

3.2 Altered States of Consciousness: Therapeutic Use

Firstly, it is important to make explicit that the West has a history of legitimate experimentation with the therapeutic use of psychoactive substances. Due to extreme political controversy, this work had been commonly forgotten (Grob, 1994), yet it forms an indispensable academic link to indigenous forms of healing and therefore cannot be ignored.

The politics of terminology

As briefly discussed by Metzner (1998), there are a number of words that can be used to describe psychoactive drugs and plants, with each carrying different connotations in spite of their etymological roots. *Psychedelic* originated in the 1950s and means “mind manifesting” (Eisner, 1997), and although it is returning to academic respectability after a decades long hiatus (Morris, 2008), the word is still strongly associated with the counterculture of the 1960s (and the colourful and hackneyed patterns that tend to accompany the term in the mainstream media). *Hallucinogen* is the standard psychiatric designation (American Psychiatric Association, 2013b), although “to hallucinate” usually implies a pathological state (similar to the older term, *psychotomimetic*), and as shall be seen this is very much at odds with local understandings of traditional medicine (and see Metzner, 1998).

Ruck, Bigwood, Staples, Ott, and Wasson (1979), unsatisfied with the linguistic options and their implications, proposed the neologism *entheogen*; formed from the Greek *entheos* (God within) and the suffix *-gen* (becoming), thus referring to the experience of divinity or otherworldliness that often accompanies the use of these substances. *Entheogen* is possibly the most compatible with indigenous and religious conceptions (Barnard, 2014), although it is largely incon-

gruent in the modern academy, which leaves the most general term; *psychoactive*. I have favoured this expression so far because it is largely value-neutral (implying little more than an effect on the mind), although it is also quite imprecise as many psychoactive substances cannot be sensibly classed as psychedelics, hallucinogens, or entheogens (e.g., cocaine or methamphetamine).

Similar to Metzner (1998), I use these words more or less interchangeably, although they do have different ontological and political connotations. When discussing scientific work, *psychedelic* or *hallucinogen* seem to be the most appropriate, whereas *entheogen* is probably more harmonious when discussing indigenous understandings (although the term does not hold well at all for hostile uses, such as witchcraft; Whitehead & Wright, 2004).

The rise, fall, and rebirth of psychedelic science

The history of psychedelic research is certainly curious. Lysergic acid diethylamide (LSD), first synthesized by Albert Hoffman in 1938, was to be a major discovery, although it was not until the 1950s and the following decade that the therapeutic properties of LSD (and other psychedelics) were actively investigated. The two main treatment models proposed were (a) the psycholytic model, where patients received low doses to help loosen psychological barriers and facilitate therapy; and (b) the psychedelic model, where high doses would take the patient into a transpersonal state so profound that insight and ongoing life change were supposedly irresistible. The psychedelic model thereby tries to induce a spiritual experience, recalling William James' famous quoting of a doctor: "The only radical remedy I know for dipsomania is religiomania" (W. James, 1902/2008a, p. 191).³

With a focus on LSD-assisted treatment for alcoholism, Mangini (1998) provides an extensive and fascinating historical review of the growth and decline of psychedelic research. Regarding treatment results, Mangini concluded that assessment was frequently difficult due to unsound methodology. Nevertheless, Krebs and Johansen (2012) recently performed a meta-analysis of randomized controlled trials from the 1960s and early 70s (with strict methodological inclusion criteria), and found that a "single dose of LSD, in the context of various alcoholism treatment programs, is associated with a decrease in alcohol misuse" (p. 1).

Despite encouraging results and repeated calls for further well-designed studies to disentangle controversial issues (Mangini, 1998), the entire psychedelics research programme ground to a halt in the early 1970s (for a brief timeline see Vollenweider & Kometer, 2010). At the heart of this failure was the political and social maelstrom that had engulfed psychedelics. The compounds, no longer confined to the laboratory or the clinic (Szara, 1967), had become associated with radical counter-cultural trends of extraordinary social impact; specifically the

³This quote is often erroneously attributed to James himself.

1960s American black civil rights and anti-war movements (Baum, 2016; Stevens, 1987). Granted, there were research-centred debates (Grob, 1994; Mangini, 1998), but the academy and its networks do not operate independently of social context, and moreover it is simply unprecedented for active investigation into an entire class of substances with promising clinical results and lack of toxicity (Halpern & Pope, 1999) to suddenly lay dormant for decades, assuming what Grob (1994) termed “pariah status”. Indeed, Szara’s appeal regarding public control to avoid “throwing out the baby with the bath water” (Szara, 1967, p. 1517) went unheard, and clinical investigations were put aside.

With the passage of time however, psychedelic hysteria eventually abated and more realistic attitudes towards risks and benefits were adopted. In the early 1990s research with human participants was cautiously resumed (Strassman, 1995) and old studies were revisited and re-evaluated, often with concerns regarding methodology, yet finding little evidence for earlier assertions that psychedelics were devoid of research or medical value (Doblin, 1991, 1998; Halpern, 1996; Krebs & Johansen, 2012; Mangini, 1998). Moreover, recent public health studies in the United States have found no association between “classic hallucinogen” use (viz., LSD, psilocybin, and mescaline) and mental illness or suicide (Hendricks, Thorne, Clark, Coombs, & Johnson, 2015; Johansen & Krebs, 2015). Despite suffering from protracted legislative and political adaptations (Bouso, Doblin, Farré, Alcázar, & Gómez-Jarabo, 2008; Calabrese, 2001; Nutt, King, & Nichols, 2013), psychedelics research has gradually gathered attention and has even been declared to have moved back “into the mainstream” (Morris, 2008).

Since the resumption, studies have appeared on a number of clinical topics including psychedelics for the treatment of depression (Baumeister, Barnes, Giaroli, & Tracy, 2014), mood disorders (Vollenweider & Kometer, 2010), and addiction (Bogenschutz & Johnson, 2016; Hendricks, Clark, Johnson, Fontaine, & Cropsey, 2014); ketamine and ketamine-assisted psychotherapy for depression (Berman et al., 2000; Maeng & Zarate, 2007; Murrough et al., 2013) and drug addiction (Krupitsky et al., 2002; Krupitsky & Grinenko, 1997); psilocybin to promote smoking cessation (M. W. Johnson, Garcia-Romeu, & Griffiths, 2016; M. W. Johnson, Garcia-Romeu, Johnson, & Griffiths, 2017), to treat obsessive-compulsive disorders (Delgado & Moreno, 1998; Moreno, Wiegand, Taitano, & Delgado, 2006) and major depression (Carhart-Harris et al., 2016), and to improve existential well-being for terminal cancer patients (Grob et al., 2011; and see Pahnke, 1969); MDMA-assisted psychotherapy for post-traumatic stress disorder (Bouso et al., 2008; Oehen, Traber, Widmer, & Schnyder, 2013); LSD-assisted psychotherapy for anxiety (Gasser, Kirchner, & Passie, 2014); and the potential treatment of cluster headaches with psilocybin, LSD, and the non-psychoactive 2-bromo-LSD (Karst, Halpern, Bernateck, & Passie, 2010; Sewell, Halpern, & Pope, 2006). In the majority of these cases, promising results have been reported, demonstrating once again the wide-ranging therapeutic possibilities that so excited researchers during the 1950s and 1960s.

An important part of the new psychedelic research programme however, apart

from an acknowledgement that the compounds are not panacean (Doblin, 1998; Eisner, 1997; Maté, 2014), is the call for recognition of indigenous heritage (Bravo & Grob, 1989; Grob, 1994; Prickett & Liester, 2014). Indeed, the scientific “discovery” of the therapeutic properties of psychedelics in the twentieth century is somewhat less impressive when considered alongside the rich history of indigenous psychoactive plant use. Although likely separated by thousands of years, the primary link is still found in the experience itself: Those altered states of consciousness that invoke descriptions such as “ineffable” or “mystical”. Despite a general scientific aversion to a spiritual ontology that exceeds changes in neurochemistry, “mystical-type” experiences have been experimentally demonstrated (Doblin, 1991; R. R. Griffiths et al., 2011; R. R. Griffiths, Richards, Johnson, McCann, & Jesse, 2008; R. R. Griffiths, Richards, McCann, & Jesse, 2006; Pahnke, 1963), and have even been associated with long-term personality change (MacLean, Johnson, & Griffiths, 2011).

The relevance of the psychedelic research programme (and its resumption) to Takiwasi lies not only in the clinical results and identification of associated biological and psychological mechanisms, but in the Western acknowledgement that these practices have ancient origins and that transrational experiences of spirituality are simply a part of the human condition (with no ontological discussion being necessary). It is clearly not unreasonable to suppose that psychedelic substances can effect therapeutic change, yet Takiwasi do not administer laboratory grade chemicals; rather they utilize, in a traditional and ritualized manner, plant-based decoctions. Fortunately, the return of psychedelic science has indeed been paralleled by an increased interest in indigenous medicines and techniques (as urged by Bravo & Grob, 1989), and this has been particularly true for ayahuasca studies.⁴ As ayahuasca is one of the primary interventions used in Takiwasi, a brief review of its therapeutic capacities will round off this examination of an a priori claim to medical legitimacy in treating addictions (e.g., see Labate et al., 2010, pp. 207–208).

Ayahuasca as therapeutic agent

The ritual use of traditional entheogens as a healing modality is not a new area of study (Winkelman, 2001). For example, Native American Church peyote ceremonies have already been associated with the reduction of alcoholism without evidence of harm (Albaugh & Anderson, 1974; Bergman, 1971; Halpern, Sherwood, Hudson, Yurgelun-Todd, & Pope, 2005; Pascaros et al., 1976). There has been considerably more work done in the area of ayahuasca however, although it is worth noting that the study of ayahuasca has generated a rich literature that extends well beyond its therapeutic potential (e.g., Luna & White, 2000).

The principal alkaloids in the ayahuasca brew (discounting admixtures) are the β -carbolines from *B. caapi* (mainly harmine, harmaline, and tetrahydro-

⁴Apud (2017) provides an overview of ayahuasca’s entrance into Western and academic thought.

harmine), and the tryptamine DMT found in *P. viridis* (Rivier & Lindgren, 1972) or *D. cabrerana* (Bennett, 1992). DMT is radically psychoactive,⁵ and sufficiently high doses “completely [replace] ongoing mental experience” with a character that is “more compelling and convincing than ‘ordinary’ reality or dreams” (Strassman, 1996, p. 122). Furthermore, DMT is likely to be endogenous in humans, with the enzyme responsible for its synthesis (indole-N-methyltransferase; INMT) being found in primate pineal gland, brain, spinal cord, and retina (Barker, McIlhenny, & Strassman, 2012). DMT itself has also been discovered in the pineal gland of live rats (Barker, Borjigin, Lomnicka, & Strassman, 2013), and Strassman has hypothesized that it represents a plausible biological mechanism for human mystical states, such as near-death or ecstatic religious experiences, and even perceived alien abductions (which were reasonably common during his DMT study; Strassman, 2001).

That the β -carbolines make DMT orally active via monoamine-oxidase (MAO) inhibition is well established (McKenna, Towers, & Abbott, 1984), although there do appear to be additional metabolic routes (Riba et al., 2012). However, ayahuasca cannot be reduced to “orally active DMT”, as there is synergistic action occurring with the alkaloids from both plants (e.g., MAO-inhibition may even reduce the effects of DMT; Ott, 1999). As opposed to the short and intense effects of smoked or intravenous DMT use (Cakic, Potkonyak, & Marshall, 2010; Strassman, 1996), ayahuasca experiences tend to last a number of hours, coming and going in waves, and without pronounced cardiovascular changes (Riba, 2003; Riba et al., 2001).

The potential for safe use with salubrious effects

The ceremonial use of ayahuasca by various Brazilian syncretic religious groups (Labate & MacRae, 2010) has provided opportunities for the naturalistic study of its effects. Investigations commonly report not only an absence of harm (Gable, 2007; Halpern, Sherwood, Passie, Blackwell, & Ruttenber, 2008), but the remission of psychopathology, increases in psychosocial well-being, normal or better than average neuropsychological performance (cf. Doering-Silveira, Lopez, et al., 2005), reductions in alcohol use, diminished anxiety levels, and even changes in personality traits (Barbosa, Cazorla, Giglio, & Strassman, 2009; Barbosa, Mizumoto, Bogenschutz, & Strassman, 2012; Bouso et al., 2012; Doering-Silveira, Grob, et al., 2005; dos Santos, Landeira-Fernandez, Strassman, Motta, & Cruz, 2007; Fábregas et al., 2010; Fernández et al., 2014; Grob et al., 1996). Of course, one cannot dissociate substance from environment in these cases, but therapeutic effects have recently been demonstrated outside of a religious context (Soler et al., 2016), therefore it is likely that the effects found in religious studies are the result of synergy between the benefits of religious community and the use of ayahuasca itself. The possibility for bias in these studies

⁵Although it is likely that a small proportion of the population shows no response (Strassman, 2001, p. 358).

does remain however, as ayahuasca-using religious groups may be hesitant to speak openly about adverse incidents, especially in ambivalent political contexts. Still, the use of ayahuasca in an appropriate context is likely to confer some therapeutic benefits (although certainly not without risk; Callaway & Grob, 1998; dos Santos, 2010, 2011, 2013; dos Santos, Bouso, & Hallak, 2017; Escobedo, 2014; Li, 2017; McVeigh, 2014; Mitra, 2015).

One of the most obvious therapeutic applications is the treatment of depression, and Palladino (2009) reported promising qualitative results for six treatment-resistant patients in interviews before and after taking ayahuasca, and de Lima Osório et al. (2011) found an antidepressant effect lasting two-weeks in a small pilot study. Good results for depression treatment in open label clinical trials (i.e., without placebo controls) have also been reported (de Lima Osório et al., 2015; Sanches et al., 2016). Such results are unsurprising given past research and the pharmacological properties of the major ayahuasca alkaloids (for reviews see Domínguez-Clavé et al., 2016; Palhano-Fontes et al., 2014). For example, depression and suicide are strongly associated with reduced brain-derived neurotrophic factor (BDNF) expression and shrinkage of the hippocampus (Drzyzga, Marcinowska, & Obuchowicz, 2009). Yet Fortunato et al. (2009) have demonstrated that the primary alkaloid in *B. caapi*, harmine, acutely increases BDNF in the hippocampus of rats—a desirable effect that antidepressant medications may also achieve (Shimizu et al., 2003). Furthermore, harmine appears to confer an anxiolytic effect, providing protection against stress-induced anhedonia (Fortunato et al., 2010), although precisely how much harmine can enter the central nervous system unmetabolized with ayahuasca seems to depend on both individual difference (e.g., genetic polymorphisms; Brierley & Davidson, 2012a) and the alkaloid contents of the brew. That said, the use of ayahuasca has been associated with increases in mindfulness and the ability to “de-centre” from thoughts and emotions (Soler et al., 2016), which could attenuate any subsequent psychological stress.

It is worth reiterating that although these effects are beginning to attract greater scientific attention, the empirical knowledge of usage is not novel. For example, amongst the Piaroa shamans of Venezuela, *caapi* remains valued for its ability to stimulate empathy, and possibly for an anti-depressant type effect (Rodd, 2008).

Ayahuasca and addiction

The amelioration of psychopathology is undoubtedly valuable when dealing with addictions in a clinical capacity (possibly even obligatory; Grant et al., 2004; Helzer & Pryzbeck, 1988), but there is evidence to suggest that ayahuasca may function as a sophisticated addiction treatment over and above that of the psychotherapeutic possibilities already outlined. As a treatment adjunct, it is important to consider that ayahuasca does not appear to promote the abuse of other drugs (Doering-Silveira, Grob, et al., 2005; Fábregas et al., 2010), nor does

it have inherent addiction potential, being unpleasant to ingest and often difficult to endure. In the context of the Brazilian ayahuasca churches, levels of self-reported recovery from substance abuse are high (Grob et al., 1996; Halpern et al., 2008; Labate, dos Santos, Strassman, Anderson, & Mizumoto, 2014; Labate et al., 2010). Observational therapeutic studies have arrived at similar results, with one study showing changes in addiction-associated personality traits, increases in life purpose, spirituality, and neuropsychological performance (Fernández et al., 2014), and another demonstrating reductions in alcohol, cocaine, and tobacco use (but not opiates or cannabis), and increases in empowerment, hope, life meaning, and mindfulness (Thomas et al., 2013).

While the ritual or therapeutic context is especially important (Maté, 2014), Oliveira-Lima et al. (2015) found that ayahuasca inhibited the development of ethanol-induced behavioural sensitization in mice (thought to reflect neural adaptations implicated in drug abuse), suggesting a potential anti-addictive pharmacological action not highly dependent on setting. Under the dual-deficit model of addiction (Rothman et al., 2000), repeated drug abuse causes increased dopamine and serotonin in the mesolimbic pathway (the “reward pathway”) and subsequent allostatic adaptations lead to depletion of both neurotransmitters and thus withdrawal symptoms, craving, depression, and impulsivity. Prickett and Liester (2014) suggest that ayahuasca may provide a global increase in serotonin (via β -carboline MAO-inhibition and DMT serotonin receptor binding), as well as have a normalizing effect on dopamine by providing levels “high enough to attenuate withdrawal, but low enough to avoid further reinforcement of addiction” (p. 117). In addition to raising serotonin, blocking the metabolism of catecholamines also raises dopamine, and harmine has also been shown to increase dopamine levels in the nucleus accumbens independently of MAO-inhibition (Brierley & Davidson, 2012b). DMT is an agonist for sigma-1 receptors (implicated in addictions; Maurice & Su, 2009), which may inhibit dopamine release. Finally, the binding of DMT at various serotonin receptor sites results in both increases and decreases of dopamine release in the reward pathway: In sum, leading to the hypothesis that ayahuasca produces a net normalizing effect, or a kind of “neurochemical normalization therapy” (Liester & Prickett, 2012). The possibility also remains that DMT (at low levels) provides an anxiolytic effect (Jacob & Presti, 2005), providing a further buffer against addiction.

Although ayahuasca may carry anti-addictive pharmacological properties, qualitative research makes it clear that there is a therapeutic effect embedded in the actual experience. Loizaga-Velder and Loizaga-Pazzi (2014) provide an overview of subjective healing experiences from professional treatment settings, and describe themes of reliving and releasing personal traumas, increasing capacity for forgiveness, gaining insight into maladaptive behavioural patterns, attaining spiritual “peak” experiences, and increasing one’s sense of purpose and meaning in life. One patient’s quote, attributed to “Omar”, demonstrates the strange capacity for insight that ayahuasca can generate:

The plant showed me that I was trapped in my alcoholism, that I was a slave to alcohol... The downward path on which I was going [alcoholism] and the other path which I could choose to go was revealed to me... [I realized that] hand in hand with my alcoholism was my idleness, rage, superficialities, egoism, etc. I could say that each ayahuasca intake was touching my insides and showing me what I was doing wrong... the way in which these things were revealed to me was fundamental, almost shocking, very precise, and so wise, that it left no room for doubting my need for change and recovery. (pp. 141–142)

Quite interesting here is that Omar attributes agency to the plant itself; even functioning as the bearer of wisdom for him. Hence from a human perspective, ayahuasca cannot be considered as a purely pharmacological intervention (Loizaga-Velder, 2013; Loizaga-Velder & Verres, 2014), or as Maté (2014) puts it, “it is certainly not a matter of ‘here, drink this tea and call me in the morning’” (p. 220). Psychologically, the roots of the addictive complex will be unique to each individual, and the psychotherapeutic functions of ayahuasca (similar to LSD and other psychedelics) can serve to offer, as with Omar, a deeper understanding of the self and its relationship to addiction. It is difficult to say exactly why this should occur, but insight is a common theme in patient reports.

Another possible link between insight and addiction is found in the redemptive model of addiction healing proposed by Dobkin de Rios, Grob, and Baker (2002), where the proper use of entheogens can elicit a process of internal freeing from an undesirable state (in this case, addiction). The peak spiritual experience plays an important role in the redemption theory, and is also typical of ayahuasca experiences. Kjellgren et al. (2009) describe a six-step process of mystical experience with ayahuasca (and see Trichter, Klimo, & Krippner, 2009): (1) motivation and aim, (2) contractile frightening state, (3) sudden transformation, (4) limitless expansive state with transpersonal experiences, (5) reflections, and finally (6) changed worldview and new orientation to life. Thus the process invokes a quasi-religious experience (or actual, depending on individual perspective) that can serve to drive the process of transcendent insight and subsequent psychological healing.

According to Kjellgren et al. (2009), the final post-reflection stage can involve greater self-awareness, reductions in fear, increases in empathy and creativity, and perhaps most importantly, a more meaningful inner world. So if, in combination with pharmacological action that reduces withdrawal symptoms and depression, these new orientations to life lead to more positive ways of relating with the self and others, it is likely that addictions can be attenuated, and possibly even healed. Put in terms of the addiction and stress model presented in chapter 2, internal impoverishment would be reduced, and buffers against relapse would be raised (even though the broader environment may continue to support addictive tendencies).

Finally, considering that supposedly genetically determined personality traits have shown mutability with the use of ayahuasca (Bouso et al., 2012; Fernández and Fábregas, 2014; and see MacLean et al., 2011) it seems likely that a number of unknown, and possibly quite profound, biological and psychological effects are taking place. Thus there seems to be scant reason to dismiss the therapeutic potential of ayahuasca, and particularly so with regard to the treatment of psychopathology and addiction.

Treatment in practice: Beyond the biomedical

From a purely psychological or biomedical perspective, it may seem that mestizo understandings (which include a world of spiritual entities) are anachronistic and could be abandoned in favour of stricter scientific views, for example by discarding the curandero and those elements deemed to be superstitious or irrational. On the contrary, I contend that we ought to be seeking out the advice and knowledge found in cultures that have long dealt with and mastered these internal states; states which are themselves irrational by nature (at least from a Western perspective). Maté (2014) writes about the possibilities of the ayahuasca experience:

The visions the plant brings to people can be beautiful, magnificent, and inspiring and engender the purest joy and gratitude; they can also be threatening, incomprehensible to the mind, and arouse terror. The emotions evoked can be gentle and soothing and suffused with peace and happiness; they can also be excruciatingly painful, frightful, and induce experiences of profound loss. The felt sense can be of ineffable freedom or of dark imprisonment. People can see and be their divine selves or be identified with the most diabolical elements of their personalities. Without preparation, processing and integration, the ayahuasca experience can be confusing and, for many, incomplete. (p. 220)

The thin divide between heaven and hell that Maté outlines is vividly demonstrated by Alan Ginsberg in an early account of two ayahuasca sessions in Pucallpa (Burroughs & Ginsberg, 1963):

Only image I can come up with is of a big black hole of God-Nose thru [sic] which I peered into a mystery — and the black hole surrounded by all creation — particularly colored snakes — all real. [...] Also a great feeling of pleasantness in my body, no nausea. (Ginsberg, 2000, p. 161)

This apparently pleasant, interesting, and expansive first experience stands in stark contrast to the second:

Then the whole fucking Cosmos broke loose around me, I think the strongest and worst I've ever had it nearly⁶ [...] I felt like a snake vomiting out the universe — or a Jivaro in head-dress with fangs vomiting up in realization of the Murder of the Universe — my death to come — everyone's death to come — all unready — I unready [...] The whole hut seemed rayed with spectral presences all suffering transfiguration with contact with a single mysterious Thing that was our fate and was sooner or later going to kill us [...] the suffering was about as much as I could bear and the thought of more suffering even deeper to come made me despair — felt, still feel, like lost soul [...] incapable of moving in any direction spiritually — not knowing who to look to or what to look for. (Ginsberg, 2000, p. 162)

The existential shock of this experience appeared to persist for Ginsberg, as he further wrote:

I hardly have the nerve to go back, afraid of some real madness, a Changed Universe permanently changed — tho' I guess change it must for me someday [...] I wish I knew who, if anyone, there is to work with that knows, if anyone knows, who I am or what I am. I wish I could hear from you. I think I'll be here long enough for a letter to reach me — write. (Ginsberg, 2000, p. 163)

Maté's caution towards preparation and integration combined with Ginsberg's unnerving personal account demonstrate, as much as is possible in text, the potential gravity of ayahuasca's relationship with human beings. Moreover, these quotes provide indications of the levels of fortitude and aptitude that might be required in order to work with these substances. The shaman is, ideally, one who has gone beyond the overpowering forces that lead to drastically negative or overpoweringly positive states. Inside ceremony, they therefore function as a secure reference for all those who may be travelling down dark recesses of their own unconscious and personal history; and the shaman or leader should surely not be correspondingly swept away by the profundity of the experience. For the curandero, this is not a matter of theory—or knowledge acquired by reason or reading—but praxis (which would also be reflected in physiological change; Bouso, Fábregas, Antonijoan, Rodríguez-Fornells, & Riba, 2013).

In the mestizo conception, the singing of sacred songs (*icaros*) performs a particularly important function for individuals: Loizaga-Velder and Loizaga-Pazzi (2014) write that “one traditional healer compared the function of *icaros* in an ayahuasca ceremony to the function of the oars of a canoe, without which the canoe would be at the mercy of the currents of the river” (p. 147). In this metaphor, the currents of the river signify more than just psychological experience, but even so, the *icaros* are psychologically useful for participants,

⁶Ginsberg was making a comparison to past experiences with psychedelics.

forming a link between participant experience and the comportment of the curandero. Moreover, the icaros arise organically from within the ayahuasca frame of reference, and it would show ethnocentric hubris to dismiss them simply because they are often intended to act on a putative spirit world. As Bravo and Grob (1989) point out, in a therapeutic setting the use of psychedelics “forces the psychiatrist to be recast as a modern-day shaman” (p. 124). If such a recasting is unavoidable, then it makes sense to take the shamanic worldview seriously, at least by looking at the effects it produces (either withholding ontological judgement or allowing for ontological pluralism).

3.3 Conclusion

It can be seen that healing with altered states of consciousness has a long history in the world, and has even been championed for a time in the West. In this chapter I have contextualized Takiwasi’s relationship to traditional medicine in the Amazon, as well as presented a scientific perspective on the likely validity of that treatment modality. However, one of the primary difficulties in the application of science to traditional medicines is the tendency to force an exclusively biomedical view. Although it has long been known, *setting* (Eisner, 1997) is vital when inducing alterations in consciousness, and this is also the case with ayahuasca. The setting provided under a mestizo understanding (i.e., the ritual) can be analysed psychologically, and it can also be analysed on its own terms, via anthropology and participant observation. At the same time, a strictly biomedical analysis essentially erases the ritual as superfluous to pharmacological action. One need only examine the recent outrage following mention of “the mystery of the Creator’s invention” in a PLOS ONE biological paper⁷ (see Davis, 2016) to imagine how medical worldviews that include spiritual entities might be received; despite the fact that in therapeutic practice with altered states of consciousness, and particularly so with ayahuasca, such worldviews may be highly adaptive and functional.

Thus with respect to shamanism, science as a social enterprise carries not only a constructive force of knowledge generation and verification, but also a potentially destructive force of cultural erosion; at worst a kind of ontological imperialism derived from the assumptions of atheism and materialism. Perhaps the best antidote to the erosion of those things which cannot be understood through science is the fostering of understanding at the subjective and experiential level, which anthropological work can at least provide in part. In the words of a famous Peruvian curandero: “I don’t despise or reject scientific knowledge. But there is another kind of knowledge which is higher, altruistic, full of love, and which resides in the contact with the infinite spiritual dimensions” (Luna & Amaringo, 1999, p. 44). If this is the experience of traditional healers, then any serious work must take it into account, or at least acknowledge it.

⁷Apparently the reference was simply a mistranslation.

Returning finally to addiction, the continued focus in this chapter on ayahuasca has been a direct consequence of the availability of academic literature, and the fact that it remains the most well researched aspect of Takiwasi's treatment. Although far from scientific certainty (Bouso & Riba, 2014), there seems to be ample evidence to give credence to the idea that Takiwasi's approach has merit in the treatment of addictions, and in the coming chapters the treatment itself will be discussed in greater detail.

Concepts of Health and Illness in Takiwasi

Synopsis In this chapter the underlying concepts of the Takiwasi treatment are examined in detail, since they are a prerequisite for understanding why the treatment proceeds as it does. Epistemological issues surrounding traditional Amazonian medicine are also discussed due to Takiwasi's cross-cultural nature. The chapter contents are based on a number of sources, including direct observation and experience, formal interviews and casual conversations with staff, patients, and volunteers, and also published literature and media regarding Takiwasi.

Broadly speaking, Takiwasi attempts to integrate the indigenous and the modern, yet there is a vast philosophical rift between the healing systems of *vegetalismo* and biomedicine. This rift has been expressed in varied representations of *ayahuasca* and spirituality (Apud, 2017; Tupper & Labate, 2014), but there remains a deep ontological division at its core. Not ontological so much in the sense of categorization, but rather in that of fundamental essence. The issue is neatly summed up in the first chapter title of Horner's (2012) work: "Are spirits real? The actual problem", and is further elaborated upon by famed *vegetalista* Don Agustin Rivas Vasquez:

For many years I have known that space is full of beings, like radio waves. All one needs is a radio. If one turns it on, one can hear voices that come through the air. Similarly, the spirits' voices, and their sound, can only be heard and the spirits seen, when one uses *ayahuasca* or other psychoactive plants, and only then one sees that space is populated with a myriad of beings. [...] But atheists and other skeptics don't know about these things because they don't know about the invisible, but only what they can see. (Adair; as cited in Horner, 2012, p. 9)

For the *vegetalista*, it is nature (which is itself held to be endowed with

consciousness) that forms the connective tissue to this world of spirits. Another well-known curandero, Pablo Amaringo,¹ explains:

Every tree, every plant, has a spirit. People may say that the plant has no mind. I tell them that the plant is alive and conscious. A plant may not talk, but there is a spirit in it that is conscious, that sees everything, which is the soul of the plant, its essence, what makes it alive. The channels through which the water and sap move are the veins of the spirit. (Luna & Amaringo, 1999, p. 33)

It goes without saying that such animism is thoroughly antithetical to the biomedical project (and post-Enlightenment thought in general). Whereas the *vegetalista* apparently learns medicine via a subjective connection with a sentient and communicative natural world (e.g., Luna, 1984a), biomedical science attempts to purge medicine of subjectivity entirely. This apparently irreconcilable difference is directly relevant to Takiwasi, since the acceptance of both systems is a defining feature of the centre. Indeed, Jacques Mabit's own personal history traces a Western doctor's transition towards incorporating a worldview based in *vegetalismo*:

When I questioned the curanderos as to how they had acquired their knowledge, they typically responded that it had come from dreams or through the ritual ingestion of ayahuasca and other psychotropic plant substances. Mysteriously, they said: "Nobody teaches you, but the plants speak to you." Frequently, I concluded my conversations with these healers asking a personal question: "Could I, a Western doctor, learn, as well?" Their answer was encouraging, and yet challenging: "Yes, the plants can teach you as well, if you love and respect them. If you ingest them strictly, according to the traditional rules—involving dieting, isolation in the forest, and sexual abstinence—the spirits will come to you and speak to you. This is the only way to learn."

Their response confronted me with a dilemma. My training as a medical doctor had taught me that "science" depends upon observable facts, requires a rigorous methodology, and demands concrete results. It also defines certain conditions necessary for experimentation and the transmission of facts. The healers proposed that I leave aside the pretense of strict objectivity in order to adopt a knowledge system that takes subjectivity into account as a valid source of information. [...] I realized that if I really wanted to learn about Indigenous medicines, I would have to abandon my Western analytical approach and humbly embark on a course of self-experimentation. (J. Mabit & Sieber, 2006, p. 2)

¹Now deceased.

The genesis of Takiwasi, and its point of departure from widely accepted Western epistemology, is found in the results of Mabit's "course of self-experimentation":

Over the course of participation in more than 350 traditional sessions, we developed a strong spiritual connection with ayahuasca. There is not room here to provide detailed descriptions of the years that we spent in apprenticeship with the plants, studying their preparation and use, mastering the use of sacred chants, and learning how to perform shamanic therapeutic interventions. However, I will say that the curanderos spoke the truth—the plants do teach. (J. Mabit & Sieber, 2006, p. 4)

Set against a background of dual medical systems with wildly divergent ontological and epistemological assumptions, the purpose of this chapter is to examine how health and illness are understood within Takiwasi. After establishing the theoretical landscape, the aetiology of addiction in Takiwasi will then be clarified in those terms.

4.1 Theoretical Domains of Health and Illness

While the primary aim at Takiwasi is the treatment of addictions, it is more broadly a health centre, albeit one that is medically cross-cultural (Kleinman, 1978). For all healing systems, accurate medical knowledge will fundamentally depend upon the comprehension of the domains within which health and illness are manifested, as well as the relationship of those domains to the tools and methods employed. The most expansive Western medical model is the biopsychosocial,² yet the fusing of traditional epistemology in Takiwasi leads to additional categories that differ from the natural systems put forward by Engel in 1980 (which more than amply cover the bases of mainstream medical thought, ranging from subatomic particles to the entire biosphere). At least six theoretical domains of human health and illness are considered to be important in Takiwasi:

- Biological
- Psychological
- Social
- Energetic
- Spiritual
- Generational

²It could be argued that the biopsychosocial-spiritual (Leukefeld & Leukefeld, 1999) is the more expansive, although the spiritual component is not normally conceived of as a natural system, but rather as a psychological or cultural subset (Bishop, 2009).

Thus for Takiwasi the roots of health or illness are, at times, located at levels of reality which are not generally accepted within secular societies (viz., the energetic and the spiritual). Moreover, these levels of reality are made apparent via shamanistic practices; specifically by revelation from so-called *teacher plants* (Luna, 1984a). This revelatory process recalls the definition of shamanism provided by Rock and Krippner (2011), where “not ordinarily attainable” information is accessed. Yet for the patients, such revelation is not necessarily delivered via a human source (e.g., from a shaman), but more usually is directly received through internally felt relationships with specific plants.

In Takiwasi, these relationships are guided and mediated by healers and psychotherapists. In fact, such management is an indispensable characteristic of the treatment: Simply taking the plants is not held to be enough (and may even be counter-productive). On the contrary, one must know how to prepare the body and mind, how to maintain safety, how to interpret the experiences, and how to integrate new information whilst sorting fact from fantasy (J. Mabit & Sieber, 2006). All of this requires a framework for understanding the world and the unusual states of consciousness that occur with plant work. As already outlined in chapter 3, Takiwasi’s framework draws heavily on the *vegetalismo* tradition. Of course, being relatively fluid, *vegetalismo* can easily incorporate the notion of spirits along with biomedical and psychological concepts, and all of these are utilized within Takiwasi.

Biological

The acknowledgement of a spiritual realm does not mean that the physical body is rejected in Takiwasi. On the contrary, both Jacques Mabit and his wife Rosa Giove are qualified medical doctors, and a screening visit to Giove’s medical centre (located externally to Takiwasi) is standard intake practice for all patients. Although Takiwasi are pioneers of the formal fusion of Western medicine, psychology, and *vegetalismo* in the treatment of addictions, the basic Western concepts are not new to *vegetalismo*. For example, the *curandero* Don Hilde asserted in 1977 that the majority of his patients had natural illnesses (as opposed to magical or spiritual), and he likewise acknowledged the presence of psychological disorders in a number of his patients (Dobkin de Rios & Rumrill, 2008b). While it is true that there is remarkably little scientific knowledge regarding the cornucopia of medicinal plants used in the Amazon (Sanz-Biset et al., 2008), there is evidence that some plants used by healers do have biomedical curative properties (Brunner, Burger, Castioni, Kapetanidis, & Christen, 2000; Fuchino et al., 2008; Kloucek, Polesny, Svobodova, Vlkova, & Kokoska, 2005; Kvist, Christensen, Rasmussen, Mejia, & Gonzalez, 2006).

Apart from potential curative effects on a physiological level (at least for certain conditions), the experiences with plants often draw patients into a deeper consideration and awareness of the body. Metaphorical images and ideas relating

to health, sickness, life, and death are particularly common.³ Additionally, a good deal of the therapeutic work in Takiwasi revolves around preparing (or cleaning) the body by way of emesis. In a freely available documentary on Takiwasi (D'Aguiar & Zahlten, 2015), Jaime Torres explains the physical part of this approach:

We use different plants, according to the case. Evidently, we have a variety of them. The procedure consists in drinking the juice of the plant, followed by drinking large amounts of water. Shortly after that, the person starts to vomit. This throwing up is a “giving back”. A giving back of toxic substances present in your body.

Such purification practices are derived from traditional Amazonian medicine (Sanz-Biset & Cañigual, 2013), demonstrating again that attention to the physical body is not solely obtained from Takiwasi's Western medical influences. Within Takiwasi however, the body that is considered in the everyday sense is not the only one, and it could more accurately be called the *gross* physical body (as opposed to the *subtle* body, which will be covered shortly).

Psychological

The psychological domain is clearly significant in Takiwasi, since it is not possible to take part in treatment at all without being assigned a psychotherapist. In my experience, the psychological is understood in varying ways, depending on the approach of the particular psychotherapist. That said, there is a definite tendency towards psychoanalytic concepts (e.g., the unconscious and the ego), transpersonal psychology (Andritzky, 1989; Grof, 2003), and depth psychology (e.g., Jungian archetypes and dream analysis). The freeing of unconscious material is a common theme, and an example is provided by Labate (2010), where a homosexual man managed to accept his repressed sexual identity after a session with ayahuasca along with vigorous physical and psychological purging.

The psychological frameworks utilized in Takiwasi are understandable given the induction of altered states of consciousness and the concomitant amplification of mental activity. This occurs not only inside ritualized sessions but also in dreams. At the beginning of my own clinical process in Takiwasi, I was rather sceptical of the suggestion that my dreaming activity and recall would increase after drinking certain plant extracts, since as an adult I very rarely remember my dreams in much detail, if at all. Nevertheless, I did indeed begin to remember my dreams. Along with an increasing dream recall, I also noticed a general emotional

³Perceiving the interconnected nature of health and illness through imagery is quite common. Shannon (2010b) recounts from an ayahuasca session: “I saw two snakes wrapped around each other. Seeing that, I realized that health and sickness are the two facets of one complex. Specifically, I reflected that if one engages with the snakes in one direction one is afflicted with disease, whereas in the other direction health and well-being are gained” (p. 147).

intensification accompanied by complex and unusual symbolic content. On one occasion during a dieta, my dream was lucid (i.e., I was fully aware that I was dreaming). While lucid dreaming is a potentially learnable skill (La Berge, 1980), it was not something that I had experienced before with such clarity.

This intensification of dreaming also occurs for inpatients. Mark was a patient who had problems with cocaine, alcohol, and LSD. In an interview he recounted a particular dream from his third dieta, during which he was taking the plants *mucura* (*Petiveria alliacea*; Jauregui et al., 2011; Sanz-Biset et al., 2008) and *ushpawasha sanango* (*Tabernaemontana undulata*; Sanz-Biset & Cañigüeral, 2013). His dream recollection represented an actual childhood memory (which although not mentioned in this episode, was marked by instances of physical abuse):

Mark: I dreamt that I was with my mother in the car. I was a young boy in the back seat, and she was driving. My mother was shouting at me to give her something, I don't remember what, but I couldn't find it. She was screaming at me, and I felt the same fear that I used to when I was young. But the crazy thing was that in the dream I turned into me now: I'm 31 years old. Then I started shouting, "Look, all these things are why I'm unhappy in my life now!", and I began to fight. [...] So now I'm working with these kinds of problems and yeah, I have a lot of issues inside myself which are very important for me—they're the origin of my pain.

The idea then is that along with a therapeutic guide, the work with plants can loosen the subconscious and promote self-knowledge, personal maturation and growth, and the resolution of traumas and maladaptive ways of relating to the self and others that might fuel addictive habits. Regarding the use of ayahuasca in Takiwasi, Dobkin de Rios and Rumrill (2008a) wrote:

Mabit uses models derived from psychoanalysis to explain the powerful therapeutic properties of ayahuasca; he explains them in terms of provoking a general amplification of perceptions, an acceleration of mental functions, and the disarming of rational ego defenses. These encourage recovery and transformation of deep subconscious complexes. (pp. 105–106)

The material that individual patients see or feel during plant sessions and dreams forms the basis for psychoanalysis and therapy. Indeed, according to Mabit, the plant-based generation of psychological material is a defining element of Takiwasi's approach:

We have found that the combination of cathartic ayahuasca sessions, followed by guided psychotherapeutic processes, encourages residents to face deep somatic memories and transcend their wounded egos. In

the most responsive cases, the patients experience a healthy deflation of ego defenses, which helps them to transcend the ego and achieve reconciliation with their spiritual nature. [...]

It is no exaggeration to say that medicinal plants play a central psychotherapeutic role at the center, and that our therapists function primarily as caretakers offering guidance and security. The visionary therapeutic experience focuses mainly on self-discovery, so that neither the therapist nor the patient is required to master the complex Indigenous cosmologies traditionally associated with ayahuasca practices. (J. Mabit & Sieber, 2006, p. 8)

In general, patients' experiences within altered states are treated as projections from the unconscious or personal history, which are available to be analysed symbolically (as with dream analysis). This is not always the case however, and the distinction between what is psychological and what is external depends on continuing communication between Takiwasi's therapists and curanderos.

Social

In relation to health, the social is also given significance in Takiwasi. This is evident in the *convivencia* (coexistence), which is one of the three stated pillars of the treatment.⁴ Convivencia refers to daily life within the therapeutic community, with the concept being that change must not remain an ideal, but instead become expressed through lived behaviours amongst others. The convivencia represents an ongoing chance for interaction and insight into relational habits, and one patient described it to me as a "mirror", in that upon reflection, many of the daily problems that occur in life lead back to one's own attitudes and behaviours.

One of the final goals of the treatment is for patients to discover their vocation, or calling in life. The results of this are as varied as human beings themselves, from a specific occupation or project, to family commitment and responsibility, to art, to spirituality; or at times simply frustration. In any event, the important point is that an authentic life direction is understood to provide existential meaning and a buffer against relapse and addiction. Mabit spoke about this final treatment stage (D'Aguiar & Zahlten, 2015):

Then we move on to identify strengths and weaknesses. And to find out what is exciting to each patient. What's worth living for. Without a life project, if a patient comes only to stop addiction, it doesn't work. It's a negative motivation. Why stop? To stop feeling ill? To suffer less? That's fine, but what do you replace that with? They need to find something deep in their hearts and guts. The desire to accomplish something. To raise a family, find a job, make art: A life project. A

⁴The two others are psychotherapy and the ingestion of medicinal plants ("Addiction treatment", n.d.).

good treatment is one that helps a patient to find a life project and leave with some perspective, a program of some kind.

This orientation towards replacing addictions with something life affirming is sometimes expressed in references to Takiwasi as a “school” or “training ground”. Within that context, the patients not only learn practical life skills, but also how to reorient their relationships and goals in order to transcend their prior way of living (which in many cases is embedded in a culture that so far has provided them with little in the way of psychosocial integration).

The final point of relation to the social in Takiwasi concerns Mabit’s theory of addiction. Although the theory itself will be explored in more detail later in this chapter, it is largely based on a comparative social analysis, carried out for example by examining how the same substance (or the same plant) can be revered as a positive force in a traditional society (with no sign of addiction), and yet be desacralized, addictive, and dangerous in a modern society. While the theory is not exclusively social, it is by no means an asocial theory that ignores the context in which addiction arises altogether.

Energetic

Pertaining exclusively to the Amazonian worldview, the energetic level presently has no biomedical parallel and is strongly related to ritual practices and taboos that would otherwise appear illogical. Before discussing the energetic level itself, it is first necessary to comment on the general mode of analytical thought regarding ritual and the mechanisms of shamanism (i.e., beyond the basic Western view that shamanism is essentially charlatanism or medical ignorance). As mentioned earlier, the idea that shamanism functions (if at all) purely on the basis of belief is deeply entrenched in secular society (cf. Winkelman, 2010; Winkelman et al., 1982). Lévi-Strauss provided a classic symbolic analysis in *Structural Anthropology*, writing: “There is, therefore, no reason to doubt the efficacy of certain magical practices. But at the same time we see that the efficacy of magic implies a belief in magic” (Lévi-Strauss, 1986, p. 168). His justification for efficacy, citing Walter Cannon (1942) on death by “voodoo curse”, is based on a fear-generated and pathologically prolonged overstimulation of the sympathetic nervous system. Given ongoing belief in the curse and its dreaded outcome, this physiological overstimulation could eventually lead to actual death. Sixty years later, Sternberg (2002) noted the remarkable soundness of Cannon’s hypothesis, and an examination of the national Swedish records for grave cancer diagnoses and subsequent cardiovascular deaths (as well as suicides) has pointed to an uncomfortably similar effect in the modern medical system (Fang et al., 2012).

If symbolism alone can provoke death, then it is not surprising that it can likewise elicit healing (apparently including even the symbolic content of narrative; Pennebaker, 2003). Of course in the case of vegetalismo, the patient’s ingestion of a psychoactive plant substance needs to be taken into account. Thus

academic analyses of the ritualistic elements in *vegetalismo* healing (at least when the patient drinks *ayahuasca*) are easily made on the grounds of psycho-biological effects (driven by innate plant chemicals) acting in concert with placebo effects derived from a framework of symbolic (or cultural) healing.

According to Dow (1986), under all symbolic frameworks the healer persuades the patient to define his illness in terms of a given structure, and thereby binds his emotions to the “transactional symbols” of that structure. From that juncture the manipulation of the transactional symbols equates with the manipulation and transformation of the patient’s emotional content (similar to psychoanalysis; Kirmayer, 1993). With full trust of the patient and a strong psychoactive substance providing heightened suggestibility (Dobkin de Rios, 1984; Ludwig, 1966), along with stimulation of emotional centres in the brain (Riba et al., 2006; Schenberg et al., 2015), the *curandero* is thus framed as a sort of aggrandized therapist. Notably however, when the patient has ingested *ayahuasca* (or another psychoactive mixture) it becomes inadequate to locate the symbolic exchange as taking place exclusively between patient and healer, since the primary symbolic exchange is actually occurring internally. Such an exchange might be better conceptualized as a transaction between patient and plant (which is in fact the essence of the *vegetalismo* initiation process; Luna, 1984a).

For biomedical science, symbolic healing is synonymous with placebo effect, and is something to be controlled and ideally eliminated in favour of “real” effects. Yet medical anthropologist Daniel Moerman writes:

There are no fundamental boundaries between the mental and the physical. A patient’s construction of a symbolic image need not be reconstructed in another order or dimension to effect his physiological, specifically healing, processes. The construction of healing symbols *is* healing. [...] Rather than trying to eliminate the placebo effect through double-blind studies, we may learn how to enhance the cultural bias which yields this complex, healing human semiotic interaction. We may be able to modify our propensity to learn about other cultures, and begin to learn from them. (Moerman et al., 1979, p. 66)

The “sham healing” that science attempts to purge from medicine remains an element of all human healing systems, and traditional practitioners are well aware of these symbolic realities. Perhaps the clearest example is again provided by Lévi-Strauss (1986), who analysed the diaries of Quesalid; a Canadian Indian shaman who originally took up a shamanic apprenticeship with the intention of exposing what he felt was a fraudulent activity (i.e., shamanism), yet slowly forgot his initial goal as he found great healing success with an essentially duplicitous technique. Somewhat strangely, he also moved towards the position that real shamanic healing existed, even though he did not consider himself to be a practitioner. Returning to Peru, the example of Don Victor given by Dobkin de Rios and

Rumrill (2008a) shows the sensitivity that vegetalistas can have towards placebo effects, yet also demonstrates a lack of orientation towards purely performance-based healing:

Don Victor claims that confidence and faith are very important. He stated: “I could cure you with a glass of water, if you have enough faith.” But he explains it as the power of God. Overall he is a devout Catholic. He tells his patients the truth. If he cannot cure them, he simply tells his patient that. For example, he would never admit to curing end-stage cancer, although he says it is possible to do so at the beginning of that illness. However, he thinks that it is very important to give the patients confidence that they will get better. Thus, he thinks it is necessary to talk and joke around, “even though you’re crying inside with the patient”. (Dobkin de Rios & Rumrill, 2008a, p. 109)

If we can accept that *vegetalismo* carries the potential for salubrious biological effects via direct plant ingestion (Frecka, Bokor, & Winkelman, 2016) in addition to the symbolic possibilities already outlined, then a bio-symbolic healing complex forms a convincing (and scientifically palatable) theory. While such a theory is credible, it remains deficient in that it fails to provide a proper account of the healer’s perspective. Examining the first perspective which is missing then returns the discussion to the subject of this section—the energetic level.

The energetic level, as understood in Takiwasi, is neither symbolic nor abstract. It could be analysed as a symbolic cultural object, but from the perspective of Takiwasi healers it is a level of physical reality which actually exists (although it is not discernible under normal conditions). It is at this level that the *energetic body* is located, which was explained to me as being “like Wi-Fi”; making reference to an invisible but pervasive presence. The metaphor extends further in that computer Wi-Fi signals carry information to and from different machines, and for Takiwasi the energetic body can influence or be influenced under certain conditions (i.e., it is potentially connective). The energetic body is not the soul, but is rather considered as a kind of subtle energetic field that everyone possesses; a thing of this world that can function as an interface point for the “invisible world” (viz., the world of spiritual forces, which will be described shortly). According to one Takiwasi healer:

The energetic body [constitutes a cover] of the physical body [and is] a certain type of [interface] between a visible and invisible world[...]. It is not only a part of the physical body, but, simultaneously, it also exceeds it. Hence, it is more sensitive to everything happening in the spiritual world. Therefore, it is vital to have some protection. Let’s consider it a certain kind of coat that protects us daily against numerous energies. (Horák, 2013, p. 82)

The notion of an energetic body is not unique to Takiwasi. Indeed, it is a concept found within vegetalismo, and Andritzky (1989) has already theorized about its potential relevance in ayahuasca healing:

In this model, the drug serves the function of setting free psychic energy or bioenergy in the healer. The infinite acceleration of the associations that are all loaded with psychic energy and the possibility to structure and form this energy through singing and evoking culturally powerful motifs [...] in a synesthetic sensory field seems to be the crucial point of drug healing. This analysis of the concrete ritual process and the explanation of the *ayahuasqueros* make it highly possible that the psychological symbolic behavior is not the healing medium but rather the setting free of structured bioenergy. (p. 85)

Further reference to an energetic component can be found by turning to Don Hilde, whose claims are somewhat congruent with Andritzky's bioenergy theory:

Like his shamanic forebears, don Hilde did not question a patient about symptoms, but rather he concentrated intensely as his hand passes over the patient's head, to read what he termed the "electromagnetic energies" of the client. This enabled don Hilde to understand if the illness was a natural one or was related to witchcraft. Spontaneously he entered into an altered state of consciousness to receive visionary input. Further diagnostic insights came to him during ayahuasca sessions. (Dobkin de Rios & Rumrill, 2008a, pp. 33–34)

Takiwasi curanderos also support this idea of bioenergy as a key element of ayahuasca healing, rather than the symbolic effect of a physical gesture. I questioned Jacques Mabit about what is required in order to "close" a person's energetic body:

David: And what is the method of closing the energetic body? Icaros, tobacco?

Jacques: Yes, one uses prayers, tobacco, perfume, salt. Salt is important for the dietas. But everything passes through the body and the gestures that you have seen are very simple. Blowing tobacco—anybody can blow tobacco. But, what is going to be effective is the energy of the person's body.

David: How does a healer find this energy? Is it something that a person has, or learns, or obtains?

Jacques: Well, there are people who have a natural talent. But even though you might have an ability—you could have a natural talent for music, but you still need to learn how to play! Likewise you can

have an ability but you need to work, to reinforce the energetic body. To strengthen and cleanse oneself, of personal problems, pride [...] to strengthen oneself with plants. To have the ability to cure people you have to do dietas, and dietas, and dietas.

So in Takiwasi the ability to operate at the energetic level is considered to require an innate ability, although it is not something that can be utilized without considerable effort and training (and in this regard, the dieta is considered to be essential; Luna, 1984b, p. 126). Moreover, a danger in the work was described in that the curandero needs to constantly strengthen and cleanse himself energetically (through the use of plants and prayer) or run the risk of falling ill due to energetic interference. In this sense, curanderismo was described to me as “permanent work”.

If the notion of working with the energetic body leads to the possibility of energetic disturbance, then it can be seen that many of the precautions and rules in Takiwasi are aimed at controlling or rectifying such disturbances. The ingestion of entheogenic plants, or *plantas sagradas* (sacred plants), is seen to open the energetic body, which is considered to be potentially dangerous in an uncontrolled environment. According to Takiwasi healers, visits to the centre (soliciting assistance) are commonly made by people suffering from persisting negative effects after an experience with ayahuasca (or other plants) has gone badly; apparently more often than not after drinking in a poorly regulated environment. For the healer, this seems to be primarily a matter of energetic regulation (e.g., the energetic body of a person was not properly closed at the end of an ayahuasca session). Most of the dietary and behavioural taboos (e.g., sexual abstinence) revolve around energetic concerns, and the increase in safety that respecting them ostensibly brings.

It is not only ayahuasca and related plants that are considered to modulate the energetic body. For Takiwasi, many consciousness-altering drugs are capable of opening the energetic body to varying degrees, thereby increasing permeability towards the spiritual dimension—with potentially disturbing results. While discussing his reasons for coming to Takiwasi, Mark spoke to me about an LSD experience that he had prior to treatment:

Mark: But New Years I had a problem because I took a big dose of LSD and I was in a park in the city, and I felt, I began to see all the people as like, demons, like devils.

David: Everyone?

Mark: Everyone. My friend. Everyone had that kind of face, there was a bad energy there.

David: You must have been afraid.

Mark: Yes! But something inside me, I had like a call from an angel. There was the evil side, and the good side. So I wanted to go to the

good side, and I was completely on drugs. But, what I felt there, for just the first time in my life, I felt it again here [in Takiwasi] with chiric sanango. The curandero said that at that time, my energetic body had opened.

The reference made here to *chiric sanango* (*Brunfelsia grandiflora*, a medicinal plant; Plowman, 1977; Schultes, 1987) is in the context of a therapeutic dieta, and the personal apprehension of a spiritual dimension. However, the most interesting feature is that an event which would be considered an LSD-induced hallucination in almost any Western clinic, was instead interpreted as the revelation of a greater dimension; essentially a “true hallucination” (albeit a negative one). Obviously, this leads to the conclusion that spiritual entities are believed to actually exist in Takiwasi, which naturally brings about discussion of the spiritual dimension itself.

Spiritual

Much like the energetic level, the spiritual level is not a metaphor within Takiwasi. It literally exists and is a plane of reality that is populated with both good and evil spirits. The perceived existence of negative spiritual entities necessitates a system of defence and control, and ritual is utilized for this purpose (amongst others). Once again, this general belief is not an invention from within Takiwasi, but rather is a staple of the worldview of Amazonian curanderismo (e.g., Bennett, 1992; Luna, 1984a, 1984b). During his 2013 MAPS conference presentation, Jacques Mabit (2013) described three “possible standpoints” regarding the function of ritual. The first is that ritual is an obsolete primitive belief. Walter Cannon (1942) made this view clear in his description of aboriginal people:

Aborigines [are] human beings so primitive, so superstitious, so ignorant that they are bewildered strangers in a hostile world. Instead of knowledge they have a fertile and unrestricted imagination which fills their environment with all manner of evil spirits capable of affecting their lives disastrously. (p. 175)

Although similar views might no longer be expressed quite so bluntly, the fundamental ideas therein are still widespread throughout modern society. Within the academy, these ideas contribute to the position from which psychopharmacological explanations dominate. The second standpoint that Mabit described is the symbolic or cultural view, which is demonstrated by Losonczy and Cappel (2014):

Ritualized misunderstanding stages an historical “working misunderstanding” between “Occidentals” and “Natives” and therefore creates new intercultural contexts. It is, at the same time, the means by which an agreement is made concerning the content of ritual action. It is

also what allows ritual action to take place and what constructs and establishes its effectiveness. (p. 106)

This cultural perspective is relativistic with regard to the content of ritual, since the intersubjective effect of symbolism is seen to be the primary causal agent (indeed, it is ostensibly what “establishes its effectiveness”). From this standpoint, ritual might be effective for various purposes, yet the form is free from external constraint (perhaps being bound only by culture and creativity).

The third and final standpoint that Mabit described constitutes spiritual realism. Although there may be academics and scientists who personally maintain spiritual beliefs, it is obvious that spiritual realism does not hold sway in any formal capacity within the academy. To espouse such views academically would be seen, at very best, as “radical” (and not in a complimentary avant-garde sense). Nevertheless, it is not a radical position for a *vegetalista*; rather it is the norm. On the process of becoming an *ayahuasquero*, Pablo Amaringo wrote:

One needs courage, a strong discipline, and to proceed by degrees. It is a long process that might take two or three years before one can venture into the higher realms. One needs a teacher that shows the correct procedures, and how to defend oneself against supernatural attack. (Luna & Amaringo, 1999, p. 28)

The fact that one is obliged to defend oneself against supernatural attack (with specific procedures) is a key element here, because from this point of view spirits are autonomous agents that need to be dealt with using whatever techniques might prove to be effective.⁵ This is the view that predominates in Takiwasi, and it is not difficult to find examples of other healers who work (or worked) under similar assumptions. Don Hilde is one:

During an *ayahuasca* session, forces of evil are present in the room, and the healer feels the desperation of patients everywhere. A wise healer has to have his own defenses—good forces that hover around him. The session is like a battlefield, and one can easily become sick. (Dobkin de Rios & Rumrill, 2008a, p. 42)

Such a perspective is shared by Mabit, who stated that while attempting to heal: “Energy can invert and invade the healer’s body. The *curandero* could fall ill, or even die”.⁶ For this reason, it is necessary that “one must drink [*ayahuasca*],

⁵Indeed, according to Luna: “The function of the ‘maestro’ or older shaman is not that of teaching medicine, which is done by the plant itself, but that of protecting the novice and instructing him in the proper way of preparing and ingesting the magic plants, in order to deal with supernatural powers” (Luna, 1984b, p. 127).

⁶The possibility of death as a consequence of inappropriate or insufficient practice (beyond a biomedical understanding) is also suggested by Luna and Amaringo (1999, p. 28) and Luna (1984b).

one must cleanse oneself [energetically], and one must pray”. When questioned about why certain patients might receive special attention during a session, he also expressed the idea of “feeling for” the patients:

Jacques: There are things that are spontaneous. That is, when I am working there are things I do automatically, that I don’t realize consciously. With respect to the spiritual world, there is a part that is conscious and a part that isn’t. The perception of the patients’ need can be a vision, or it could be a smell also. But there are also thoughts or things you can feel. For example, in the darkness of one session, I felt a danger for a particular person. I felt it and I went immediately, and the person was losing consciousness, leaving their spirit. Dangerous. But my body alerted me, that is, I felt it physically—the anguish and where it came from. So it manifests in very different forms.

As mentioned earlier, the opening of the energetic body is considered to be the gateway to interaction with the spiritual world, and from a traditional perspective the inadequate management of this interaction carries a danger.⁷ Thus for Takiwasi a lack of concern towards spiritual entities would be viewed as essentially unethical, since the shaman’s task is to mediate the real world of spirits which is made accessible via the use of teacher plants. This mediation is done on behalf of those drinking ayahuasca, and is considered to be fundamental knowledge required for safety. Jacques Mabit writes:

I believe that the true danger of ayahuasca use is spiritual in essence, since it opens the doors to the dimensions of the invisible world wherein there lies the possibility of infestation by exposing oneself without protection (essentially ritual) to harmful psychic and spiritual forces. (Labate et al., 2011, p. 242)

It can be seen therefore that the orientation one has towards the spiritual world is a determining factor in how the purpose and content of ritual is perceived. For Takiwasi, one of the most serious consequences of opening the body to the spiritual dimension under unfavourable conditions is the potential for the subsequent attachment of negative spiritual entities (i.e., so-called *infestation*). When questioned about drug use and psychotic breaks, Mabit responded in the following way:

Drug consumption, in the same way as ayahuasca, opens the energetic body, it makes it porous or permeable to the energetic-spiritual

⁷This ontological position stands in contrast with developing neo-shamanic or psychonautic movements, which tend to promote unrestricted freedom of interpretation regarding experiences (Gearin, 2015).

influences, but, unlike a well-conducted therapeutic session with ayahuasca, it does this in contexts that are very pejorative and dangerous on an energetic level (sexual promiscuity, confused intentions, lack of an effective ritual, lack of guidance, etc). These inadequate conditions of recreational drug consumption, allow the subject to be infested by a malignant entity (*bad spirits* as the *curanderos* say, or *demons and devils* according to religious nomenclature). As such many cannabinoid psychoses reveal themselves to be, in reality, consequences on a mental level of the disturbing invasion of the subject's spirit by foreign malignant forces. Proceeding to the patient's detoxification and then to an intervention to extract or eject that parasitic entity, the subject returns to normal without the need for any anti-psychotic medication. This spiritual liberation is equivalent to a form of exorcism. (Labate et al., 2011, p. 237)

The theory of addiction in Takiwasi is not that all patients have a spiritual infestation, but rather that it is one possible consequence of drug use (or other factors, including transgenerational effects). During my fieldwork there was only a single case in which a "parasitic entity" was extracted by healers, although I was not aware that it had taken place at the time (even though I was present at the centre), since it did not occur during an ayahuasca session. In other cases patients might feel that they have been liberated from some spiritual force without intervention by a curandero (e.g., during a dieta).

The idea of a spiritual world is without doubt central to Takiwasi's conception of health, illness, and indeed patient care. Yet while the system in Takiwasi has a strong emphasis placed on controlling the negative aspects of the spiritual world, the therapeutic goal is actually to foster a healthy relationship with the positive aspects (for instance through meditation, prayer, religious community, and existential well-being). This dualistic perspective, rooted in Christian religion, spiritual realism, and vegetalismo, presents an interesting dichotomy alongside the academic literature on addiction and spirituality: On the one hand, spirituality has been seen as a legitimate resource against addictions (Geppert et al., 2007; Humphreys & Gifford, 2006; W. R. Miller, 1998), and in this sense Takiwasi's religious and spiritual orientation might be viewed as pragmatically useful. On the other hand, modern medical and academic thought rejects the actual content of religion, and this places Takiwasi (and Amazonian traditional medicine in general) in an uneasy relationship towards the West. As Labate et al. (2010) point out, Takiwasi requires credible scientific studies in order to internationally demonstrate treatment effectiveness. However, these same studies will often tend to intellectually purge or understate those elements that are culturally and professionally objectionable (aims that can be unconsciously achieved through methodology; Bishop, 2009). Nonetheless, for Takiwasi, paying attention to the spiritual world will remain an obligatory concern with regard to therapy and patient safety.

Generational

The final identified domain of health and illness in Takiwasi is the generational. This category contains problems that are seen to be related to negative tendencies, unresolved issues, transgressions, or traumas in the family or family lineage. Given normal genetic inheritance and the recent surge of interest in epigenetics (Hertzman & Boyce, 2010), as well as epigenetic inheritance (Bollati & Baccarelli, 2010; D'Urso & Brickner, 2014; Heard & Martienssen, 2014; Ho & Burggren, 2010; Yehuda et al., 2005), this category might be somewhat less controversial than the energetic and spiritual levels. However, according to Mabit:

Observation through traditional medicine attests that there exists a trans-generational transmission of problems. Transgressions against life, against the laws of life, are transmitted from generation to generation until the offence is resolved, repaired, expiated in some fashion, until forgiveness can happen. (Apfell-Marglin, 2007, p. 36)

As alluded to in this quote, the mechanism for dealing with generational issues in Takiwasi often interfaces with the spiritual and the transpersonal. Regarding her time as a researcher and outpatient in Takiwasi, Black (2014) wrote: “[There I] engaged in ancestral and spiritual healing work, met with my psychotherapist, [...] and drank medicinal plants. In a series of ceremonies, I systematically forgave and cleared negative connections with my entire ancestral lineage” (pp. 5–6). While certainly not a universal experience, the feeling of establishing a connection (or direct encounter) with ancestral figures is not uncommon with ayahuasca. Indeed, one Takiwasi therapist explained the idea of “spiritual inheritance” to me, asserting that it could be made apparent via the use of ayahuasca:

Therapist: We have a priest here because some of the problems have, a sort of spiritual inheritance that you have to clean and repair. You could say that the things that your ancestor did, you “have them on you”, and you have to repair all that.

David: And these are things that you can apprehend, or see, in the ayahuasca sessions?

Therapist: Of course. You can see them, very clearly. And it’s amazing that when you do a mass to repair that, and then you have another ayahuasca session, you can see it.

The mass being referenced here is a Christian mass, conducted by the resident priest within Takiwasi, which carries the purpose of forgiving one’s ancestors of wrongdoings. Notably, the mass is not part of an ayahuasca ceremony, but rather is an event that is attended separately on its own religious terms. Yet given the spiritual realism found in Takiwasi, it is held that such a ritual can have genuine effects (i.e., within the spiritual world), and the same therapist recounted her own experience of this:

Therapist: When I first came here, I was told that there is a mass for the liberation of the family tree. The liberation of all your ancestors—

David: Past, inheritance, that sort of thing?

Therapist: Yes. And I was told that it doesn't matter if you're not Christian—because I was not—just do it, and then see what happens in your ayahuasca session. And I said OK, I will do it as an experiment.

David: What happened?

Therapist: I felt, during my ayahuasca experience, that we went to Hell. And I could see, I could feel that there were a lot of my ancestors, not the exact identities, but the sensation. And the curandero was in charge of cutting—because they had rotten body parts—and he was cutting away those rotten parts; cleaning.

David: And you could see him doing the cutting?

Therapist: Yes. It was impressive. It was like the plant was showing me, “You are a witness, this is real, this exists. And here, it's the effect, it's the cleaning of the ceremony you did. The mass you did”.

However, the generational component of health in Takiwasi is not necessarily viewed as being amenable to spiritual intervention. For instance Paul, an inpatient who had been using cocaine as a form of self-medication, recognized a genetic contribution to his emotional tendencies that he did not view as malleable:

Paul: I came here principally because of my drug problem. But in Takiwasi I have discovered, in effect, how I ended up using drugs. I also have emotional issues, to do with fear and shame. It's not my entire problem, but you could say it's the cornerstone of my difficulties. And there is a genetic component, an inheritance from my parents. My father was prone to depression, very introverted, and my mother was a very worried and anxious person, with a lot of fears. So I have many of those factors.

But like I've said to you, my healing process here is very rational. In reality my healing comes through understanding that my problem is self-generated—yes I am person who is more timid, embarrassed, and introverted, and I can't change that—but, I don't have to isolate myself from the world.

So although generational problems in Takiwasi might be seen as having an objective spiritual component, there are also cases where such issues are approached in a more psychological fashion. In fact, with respect to psychotherapy, familial relationships make for the most commonly discussed topics in Takiwasi:

Inside therapy, the three most frequently used nouns⁸ are *padre*⁹ (father), *madre* (mother), and *vida* (life).

Thus the generational, like many other aspects of Takiwasi, carries multiple understandings and perspectives. Indeed, this domain is a prime example of Takiwasi's syncretism, as generational problems may be explained in terms of concepts that are biological, psychological, social, energetic, as well as spiritual.

Domain interdependence

So far six separate theoretical domains have been categorized and analysed, although in treatment practice they are often interdependent. An especially frequent linkage in that regard is between mind and body. Claire Sieber (2003), reflecting on her experience at Takiwasi, wrote:

The opportunity to reflect upon [emotional anxieties] in an environment conducive to self-expression and interpretation, such as Takiwasi, helped me to realize the value of actually taking the time to confront [upsetting] memories, rather than to ignore them, or push them aside. It soon became clear to me that the suppression of painful memories could make me sick. (p. 123)

Conceptions of psychosomatic health were also conveyed by inpatients. After the close of a lengthy ayahuasca session, one Takiwasi patient discussed part of his journey, which he expressed to me using a metaphor: He had received an understanding that he functioned, psychologically, like a poorly tuned guitar. He saw his thought processes as the equivalent of striking dissonant guitar chords; in effect, a form of “self-torture”. Moreover, he felt a realization that the constant generation of these dysfunctional thoughts was contributing to a long-term stomach problem that he had. In a later interview the same patient also connected the experience with an energetic understanding:

Paul: I felt that all of the problems I have—that I generate them energetically. I have an energy that is not well-directed. During the ayahuasca I perceived that my energy is very bad. It doesn't flow with the environment, with other people. And in the ayahuasca I understood this metaphor of the guitar—I felt like an out of tune guitar. I received a lot of information in that way; about things that I am working on at the moment.

While it is not possible to verify the accuracy of these psychosomatic and energetic notions in terms of health outcomes, they remain good examples of the interdependence between theoretical levels in actual practice. Moreover, this

⁸Based on a textual analysis of 2,092 Takiwasi clinical records.

⁹This is somewhat confounded by the fact that *Padre* could also refer to Takiwasi's priest.

same interdependence is manifested at the staff level. From a healing perspective, Takiwasi staff try to combine the previously outlined six levels of analysis (depending on individual speciality) in order to approach the most effective and safe plans for their patients. For instance, one Takiwasi therapist spoke about the connection between the work of therapists (the psychological) and curanderos (the energetic/spiritual):

Therapist: There are many levels and all the levels co-exist. There is no one level that is more important than the others. With my patients, sometimes the curandero sees things in the ayahuasca ceremony that my patients haven't yet told me in their psychotherapy. Sexual abuse is one example. It's very typical. So that's why we all work together. From the side of psychotherapy we prepare for the ayahuasca, and also in the ayahuasca they can see things that help the psychotherapy; help to open new avenues in which we have to work.

The same position has also been reiterated by Takiwasi healers:

The key word is "integration". The integration of two medicinal practices. In Takiwasi, they are equally important, it's a combination. The curanderos are not more important than the psychologists and vice versa. There is no dominant tendency. Takiwasi attempts to create a bridge to articulate these two practices adequately. That's what we do here: The therapeutic protocol is based in part on traditional medicine and in part on contemporary psychology. (D'Aguiar & Zahlten, 2015)

Within that combination, those theoretical levels which exceed Western rationality (viz., the energetic and the spiritual) are necessary simply due to the pluralistic incorporation of traditional Amazonian medicine. While these levels appear to be irrational from a Western point of view, they remain comprehensible, explainable, and rational from the practitioner's perspective (e.g., Luna & Amaringo, 1999). Such levels also tend to attract the most interest (or criticism) from Westerners, precisely because they seem exotic, unusual, or just plain suspicious. In Takiwasi however, traditional medicine is respected because it has been found to be effective—yet it is not idealized as a cure-all. As shall be seen in chapter 5, this is an important point, as there are conditions and situations which are not amenable to traditional methods.

Thus in terms of treatment, the description of a given patient's problems across levels will depend on the analyses and perspectives of the relevant personnel (i.e., curanderos, psychologists, and medical staff). While these levels are applied in a general sense with respect to health and illness, they also form the basis for understanding the illness of addiction, and it is now possible to discuss the addiction theories that prevail in Takiwasi.

4.2 Addiction

Fundamental theory

Although Takiwasi therapists may each hold their own perspectives on addiction (Berlowitz et al., in press), in general their views can be theoretically grouped as biopsychosocial-spiritual (Leukefeld & Leukefeld, 1999). However, there is an underlying theory of addiction which is fundamental to Takiwasi, and which is embedded in the logic of the centre and the treatment. The theory has been discussed by J. Mabit and Sieber (2006) as well as presented by J. Mabit (2014), and features the following key arguments: (a) that the alteration of consciousness is a natural human (and animal) instinct (Siegel, 2005); (b) that addiction was absent in many traditional societies, even though psychoactive substances were used, and hence is essentially a problem of modernity (Alexander, 2008); (c) that the same natural substance can lead to either positive (i.e., socially functional) or negative (i.e., harmful or addictive) outcomes depending on how it is approached, prepared, and used (e.g., Hurtado-Gumucio, 2000; J. Mabit, 2014; Montoya & Chilcoat, 1996); (d) that Western society, despite obvious material and technological progress, has largely lost its connection with the sacred and with deep structures of meaning that are innately available to human beings (and which run counter to addictions by their nature); (e) that the re-reestablishment of these connections is still possible; and finally (f) that traditional Amazonian medicine, in its proper context, provides one such avenue of re-establishment.

This theory, which is not completely at odds with the theoretical exposition in chapter 2, does not suggest that biological and psychological factors are irrelevant to addiction. Rather it postulates the broad social and cultural context within which addiction exists, and also suggests that the healing of an addiction on an individual level requires that it be replaced with something deeply meaningful and life-affirming. From J. Mabit and Sieber (2006):

Humans have an instinctive psychological need to seek altered states of consciousness because those states naturally engender a renewed sense of meaning, thereby providing therapeutic healing and integration. I have come to see that drug use often begins as an attempt—albeit clumsy and sometimes dangerous—to break through and transcend the limitations of an uninspired and devitalized lifestyle. Unfortunately, because the use of psychotropic drugs has been criminalized in Western cultures, they are often used outside of controlled settings, under chaotic conditions that tend to produce confused, counterproductive experiences. [...]

In contrast to many Western drug treatment approaches, the Takiwasi model is definitely not based on abstinence—it respects the addict's innate need to experience altered states of consciousness, and it

furnishes him with safe, non-addictive means to reach them. In fact, the program actively encourages the ritual ingestion of beverages that we make from the ayahuasca vine and several other non-addictive psychotropic plants, which we have found helpful in catalyzing rapid psychological transformations. (pp. 5–7)

In the political context of an ongoing “war on drugs” (Buchanan & Young, 2000), it is highly unusual for an addiction treatment centre to promote the use of psychoactive substances for patients. But recreational drug use, including psychonautic experimentation (Deluca et al., 2012; Orsolini, Papanti, Francesconi, & Schifano, 2015), is rejected in Takiwasi. Therefore the message to patients is not that substance use is inherently wrong, but rather that they have been ignorant about what the alteration of consciousness actually entails. Once again, from J. Mabit and Sieber (2006):

We use ayahuasca at Takiwasi to transcend the veils of ordinary consciousness, so that the patient can explore and come to terms with his inner universe. At no point are the patients actually under the threat of death during an ayahuasca session[...]. However, it is common during the ayahuasca sessions, to be confronted with the prospect of one’s own death. This confrontation provokes a re-evaluation of one’s life and its significance, thus helping patients to value their existence and set meaningful life objectives. Through this experience, they also discover the spiritual significance of the “other world”, their “inner world”, and the forces that exist therein. This discovery demands respect for forces of life and death that are beyond their control, aids in the recognition of forces that are within their control, and alerts them to the obvious dangers of drugs taken for recreational purposes. Patients cultivate awareness of the power behind altered states of consciousness, and realize that the ingestion of consciousness altering substances, and touching other realms, is not a game. (pp. 7–8)

Thus the Takiwasi approach attempts to validate an intrinsic quest for existential meaning through the alteration of consciousness, but at the same time strives to instil in patients a sense of respect, humility, and discipline (which is founded upon a traditional Amazonian worldview). In general this approach appears to be effective. When I asked one patient (who had a history of cocaine abuse) for his opinion on the existence of spiritual forces, he replied that this was something in which he could not personally believe, yet he also maintained that he would never drink ayahuasca without a knowledgeable curandero who also worked in a ritualized context. Despite a lack of belief in the apparent purpose of the ritual, the structure was still appreciated as providing a sense of safety, reliability, and expertise.

Basic treatment concepts

Takiwasi's orientation towards the alteration of consciousness certainly sets the centre apart from the majority of Western treatment facilities and programmes. The uniqueness of their approach to addiction also requires that the staff share some common understanding of why such an approach is appropriate in the first place:

David: When it comes to addiction, is there an agreed upon understanding amongst the therapists and the curanderos?

Therapist: Of course we have a common vision. But for me as a psychologist, I've learned a lot about the curandero vision of addiction, which has spiritual elements that I didn't know about. But we always learn from each other. I think this is the rich thing here in Takiwasi.

This "common vision" is the fundamental theory of addiction that was previously outlined, as it provides the framework from within which the application of traditional Amazonian medicine becomes logical. Yet while there is a shared social, cultural, or existential understanding of addiction, when it comes to the treatment of a specific patient, various elements are drawn out from the six principal domains of health and illness depending on the individual case:

Therapist: You have to understand first that addiction is such a complex world. There are so many different factors. My view is that it's like working with the layers of an onion: You never know when you will get to the core—you never know how many layers you have to go deeper and deeper and deeper. Because each patient is different. And each patient has his own complexity.

So in terms of individual patient treatment, there is no preconceived diagnosis which is universally applicable (apart from the presence of an addiction). What occurs instead is an iterative search in which the patient and therapeutic staff engage together, principally by means of psychotherapy, plant work, and dream recollection. Paul described his own process as like having a "laboratory" at his disposal:

Paul: For me Takiwasi has been like a laboratory, but one where I am obliged to study myself. And this aspect has permitted me to analyse my problems. It's given me a magnifying glass. To look at what's happening to me. To feel. To see what's happening physically, emotionally, energetically, and spiritually. These are the four areas that I've been able to analyse. To analyse my problems and then search for tools to alleviate them. Some activities help me to feel calmer; reading, meditating, going to church, these sorts of things. But they are not my cure. Where is the cure for me? It's in speaking it. In remembering it and retelling it. In vomiting it, in dieting it, in purging it.

This quote captures the essence of the patient's journey, which is at heart an ongoing analysis and transformation of the self with respect to the various domains of reality that Takiwasi's methods putatively allow access to. Yet cutting across the theoretical complexity of these domains are two treatment concepts which are nearly ubiquitous; namely, the ideas of *cleaning* (or purification), and *revelation*.

Therapist: You could say that nine months of treatment is a lot, but it's not. You have to remember that the patients are usually around 20 to 30 years old, and it's not only themselves, but also the charge of their family. You have to deal with all that; so it's not only their life. This is the complexity. And at the spiritual level it's like you charge with a lot of, spiritual darkness, that you have to clean.

David: And this comes out in the ayahuasca sessions?

Therapist: Yes, and you don't know how much there is. Because you clean and clean and clean, and then it's like going down in the basement of a house where you don't know how many levels deep it might go. And you have to go and shine a light—

David: There might be a lot of rubbish in there?

Therapist: Yes! And then you have to clean, clean and then—over there you thought there was a wall—but there is a door! And, then you have to enter that door. It's like this.

The “charge” referred to here is a common term in Takiwasi, and it represents an accumulation of negative life influences, as they become inscribed in the person's physical body, mind, energetic body, and spirit. The actual Spanish word is *carga*, and another acceptable translation could be “load” (or “burden”), which at the biological level has some affinity with the concept of allostatic load (McEwen, 2000; McEwen & Wingfield, 2003). Obviously in Takiwasi, accumulated load can also be transmitted in a generational as well as a spiritual sense, and objects at these levels might also require cleaning (or purification).

When examining cleaning processes as they occur in treatment, the theoretical domains once again tend to be seen as interdependent. For instance, although emesis in Takiwasi is considered to be useful in the purging of physiological contaminants (e.g., from the liver), the act of vomiting often carries a marked psychological effect. With traditional Amazonian medicines, and particularly with ayahuasca, the physical act of vomiting is frequently associated with the perceived release of negative psychological content (Loizaga-Velder, 2013; Schmid, Jungaberle, & Verres, 2010). In her Takiwasi fieldnotes, Sieber (2003) wrote about such an experience with a purgative plant known as *yawar panga* (*Aristolochia* sp.; Jauregui et al., 2011; J. Mabit, Giove, & Vega, 1996; Mercante, 2015):

I spent the next hour or so, as the sun set, trying to lie down, but vomiting from very deep...at one point, I vomited so hard that I lost myself in another time. I felt the presence of two ex-boyfriends from high school, and I felt very insecure and vomited up something vile that was lodged somewhere deep. After that delirious moment I felt a warm, tingling exhilaration throughout my being. [...] The simultaneous puking and gripping sensation of insecurity helped me to feel that I was releasing or purging this emotion that had been lodged somewhere in my body for over ten years. (pp. 120–121)

This example combines both revelation and cleaning: That is, the revelation of psychological material (in this case a memory with a negative emotional association), and subsequent cleaning via the perceived expulsion of the emotional content, which was experienced as something repulsive being forced from the stomach with an ensuing feeling of relief.

The final example to close off this chapter makes reference to revelation and cleaning on the spiritual level. This report is based on a patient's experience during his second dieta, taking chiric sanango and *bobinzana* (*Calliandra angustifolia*; Sanz-Biset & Cañigüeral, 2011). The prior context is that a revelation had been received, via the use of ayahuasca, that a spiritual infestation of a generational nature was present (i.e., that a negative spiritual attachment was being passed down through the bloodline):

Mark: The last night in my dieta the plant showed me that something happened with my grandparents and my mother when she was a young girl; that the Devil got inside my mother. I didn't have any ideas about that beforehand, but I was shown in a dream—it was like watching a movie. I saw the face of a man, his eyes went red, and he was yelling about how they feel anger in the country. I woke up in the chacra,¹⁰ all dark, and I felt a really, really bad energy, so I started to pray. I was praying the Our Father, and then it faded and I began to feel like God was inside me. That's when I felt the bad spirit leave me.

After I arrived back at Takiwasi and had passed the post-dieta, I called my mother. I said, "Mama, what happened to you? With you and Grandpa in the country?". And my mother said, "How do you know about that?", and I told her that I saw it in a dream. Well, it turned out that something *had* happened, something that she had never spoken about. My grandfather had abused¹¹ my mother when she was young, and that plant told me through my dream. It was crazy.

¹⁰An isolated area in the jungle (without electricity) where the dietas take place.

¹¹In the sense of physical violence.

While the contents of this report could certainly be rationalized as something other than an intelligent plant entity intervening in a spiritual matter, that would not alter the actual experience of the patient. After the apparent spiritual cleansing, Mark moved on to more psychological matters, principally dealing with his childhood and familial relationships. This exemplifies the therapist's earlier metaphor of treatment being like removing "onion layers", as the resolution of a problem at one level then allows for deeper insight into other levels. As can be seen from this example, the progression is flexible, and is not necessarily a linear movement towards a spiritual diagnosis.

4.3 Conclusion

In this chapter the principal domains of health and illness in Takiwasi have been presented, along with an analysis of their relationship to the treatment of addictions. Evidently, health and illness are covered by a broad spectrum of theoretical concepts, some of which are completely alien to biomedicine and secular society in general. While Takiwasi healers have found a traditional mestizo approach to be compelling, no amount of writing can make the locus of their work (i.e., the inner world) known. Questions of efficacy aside, it simply is not possible to teach *vegetalismo* in the Western didactic manner (e.g., from books or lectures),¹² and hence anyone without training as a healer (which includes myself) has practically no real knowledge of its essence.

Although science is often championed for revealing the objective workings of formerly mysterious phenomena, the entire subjective world of living consciousness remains impenetrable by definition (and is only ever reached in others by inference¹³). Yet when the Western mind turns its attention to shamanism, the practitioner's (and even the patient's) world is often reconstituted in academic terms, be they biological, psychological, or social. It appears that great technological and material progress via the scientific method has created a cultural prejudice which renders the indigenous mind a curiosity for the West—perhaps something to be preserved, but only because of a moral imperative to do so (if even that is granted). In the face of this, the fundamental claim from Takiwasi is that traditional Amazonian practices, as transmitted through mestizo culture, constitute a genuine body of knowledge with real implications for human

¹²One Peruvian shaman put it this way: "[Western doctors] learn by reading books. But we just take this liquid (*ayahuasca*), keep the diet, and then we learn" (Luna, 1984a, p. 142).

¹³At least from the perspective of cognitive psychology, although at times Takiwasi patients may experience the feeling that they know another's consciousness directly.

health and well-being.¹⁴ Moreover, it is held that this body of knowledge is not incompatible with Western medical knowledge, but rather is complimentary. In the next chapter, exactly how these claims translate into addiction treatment practice will be examined more closely.

¹⁴Horner (2012) takes a similar analysis much further: “Non-Occidental, ‘animistic’ ontologies and cosmologies are not just curios to be investigated and speculated about, nor subaltern voices that need to be spoken in order to exorcise white guilt. The animism of Amerindian cosmologies provide invaluable resources for living, perceiving, and knowing in a critical time of the planet when the continuation of modernity and the liberal humanist subject spells the continuation of the militarism, nuclearism, and ecological devastation in which it is historically and politically implicated” (p. 63).

Addiction Treatment in Practice

Synopsis In this chapter the Takiwasi treatment is discussed in greater detail. The ways of being that the treatment tends to produce are represented by focusing on the experiences of nine inpatients across the major treatment techniques. Daily life in the centre is also discussed, along with themes of personal change which were evident in certain patients. The universality of these themes as a consequence of treatment is also considered.

From the perspective of treatment and healing, the majority of substantive events which take place in Takiwasi are inaccessible to researchers. These events include internal journeys with plant substances, the contents of dreams, and also private conversations held in therapy and meetings which would shape the direction in which treatment for a particular patient would proceed. The degree to which these inaccessible events can be approximated in text depends primarily on two interconnected things: (a) the ability and willingness of people to translate personal (and at times ineffable) experiences into language for the researcher's benefit, and (b) the ethnographic positioning of the researcher with respect to Takiwasi's social context.

The first point refers mainly to entheogenic experiences with plants, which are normally intertwined with the actions of healers, and which are most often the primary catalysts for change in Takiwasi patients. The second point conditions and restricts the entire viewpoint from which a given researcher is able to understand Takiwasi at all, and in fact an explanation of my own ethnographic positioning (provided further ahead) will help to demonstrate the nature of Takiwasi's internal social structure and logic.

The contents of this chapter then are mostly based on my own ethnographic experiences and observations, and rely heavily on recorded interviews with patients (which I was able to better understand by using my own participant observation experiences as reference points). In these interviews I asked patients to tell me about how they came to be in Takiwasi (i.e., to describe their prior life and the problems that had led to inpatient addiction treatment), and then to explain

what had transpired during their time in Takiwasi. This unstructured approach brought about what were in effect free flowing casual conversations, allowing patients to tell their own stories in whatever level of detail they felt comfortable with (which naturally differed depending on the individual). Moreover, this approach allowed for patients to focus on the treatment aspects that had been particularly salient for them.

The purpose of this chapter is not to uncover all of the qualitative themes which might conceivably be analysed in Takiwasi, nor is the aim to provide complete account of the treatment and its structure. The goal is, as much as possible, to illustrate the essence of the treatment and to allow the Takiwasi patients to speak. If their perspectives provide some insight into what the treatment is actually like, then this chapter will have proved useful.

5.1 Patients

The basic patient demographics provided further ahead in chapter 6 (see Table 6.1) suggest that the average Takiwasi patient: (a) resides in South America; (b) is under the age of 30; (c) is either non-religious or Christian; and (d) has problems with alcohol, cannabis, or a cocaine-based drug (usually in the context of polysubstance abuse). Moreover, quantitative data suggest that Takiwasi patients tend to have quite severe drug, familial, and psychological problems (see Table 6.2). However, this theoretical “average patient” obscures the reality of difference amongst patients and their life histories. Thus throughout this chapter, quotes from recorded interviews with nine individual Takiwasi patients will be presented on a variety of treatment topics.

Backgrounds, reasons, and addictions

In my discussions with patients regarding their life history, drug use tended to start at a young age. Common themes included prior failure with mainstream addiction treatment methods, attempted suicide, as well as major life disturbances (involving drugs or their addictive habit) that had prompted the solicitation of treatment at Takiwasi.

While full case studies would prove interesting, there is insufficient space to go into great detail. Instead, a brief sketch of each patient’s background will be presented, along with their Addiction Severity Index (ASI; McLellan, Cacciola, Alterman, Rikoon, & Carise, 2006) score on admission to Takiwasi.¹ The ASI quantifies the severity of a patient’s life problems across seven domains: medical problems, employment problems, alcohol use, drug use, legal difficulties, family problems, and psychiatric issues. In Figure 5.1, each patient’s ASI domain scores are presented with red straight lines (sorted by severity of drug problem), with the USA inpatient average score (McLellan et al., 2006) in blue broken lines

¹There were no Takiwasi ASI records available for one patient (Isaac).

for comparative purposes. Also included for comparison are ASI scores from a Brazilian non-clinical urban population (Fábregas et al., 2010). For further information on the ASI, see the measures section in chapter 6.

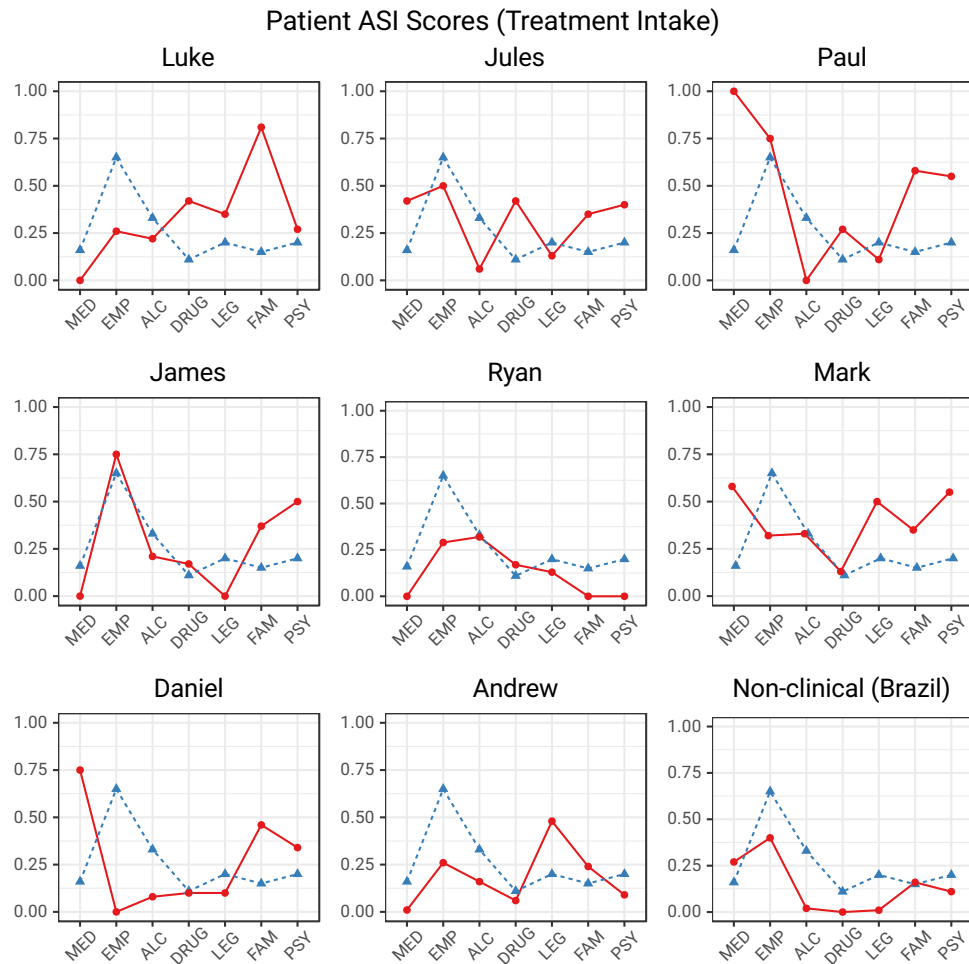


Figure 5.1

ASI profiles: Takiwasi patients versus USA inpatient average

Luke was a South American patient in his 20s. He described a violent and emotionally distant father who was fixated on scholastic success for his children. Although well-educated, Luke found a means of rebellion in drug use (starting while he was still in school), and eventually he began to experiment with crack cocaine (the use of which he said, “changed his life forever”). Pressures at home combined with his drug use and social network led him to break away from his family and live in a slum where he sold (and smoked) crack cocaine.

He did manage to leave this environment (and the drug), but in later life he moved to Europe and quickly found himself in a difficult family situation of his own. Despite having family responsibilities and children to care for, he was deeply involved with the use of amphetamines and pornography. He was violent at home, was probably suffering from depression and social phobia, had been caught stealing from work, had lost his driving licence, had been hospitalized a number of times due to excessive drug use, and had also attempted suicide by overdose. In terms of prior treatment, various psychiatric medications were tried (including fluoxetine, bupropion, and quetiapine) and he was receiving a mental health disability pension.

Jules was a South American in his 20s who was addicted to methadone. He lived at home and had not yet acquired financial independence, which he saw as a problem since his girlfriend had recently fallen pregnant. He felt that it was difficult for him to escape opiates since he had a “legal dealer” (i.e., his psychiatrist who prescribed the methadone). After about a month and a half of treatment at Takiwasi, Jules felt that his treatment was sufficient and left voluntarily, although Takiwasi staff tried to dissuade him from doing so.

Paul was in his 40s and had problems with cocaine, and some of his experiences were shared in chapter 4. His family had relocated to South America when he was around eight years old, and he experienced considerable difficulty in integrating with the local culture. In later life he developed a social phobia which led to a variety of failures connected with work and study. He explained that he was a very fearful person, with a lot of shame and insecurity—feelings which he described as “dominating” his adult life. As opposed to a more common hedonistic approach, his use of cocaine was a kind of self-medication applied to anaesthetize his feelings. However, this desensitization was only temporary, and it amplified his emotional problems in an ongoing and circular manner.

James was a European in his 30s who had been working as a labourer. Although he had used a variety of drugs since a young age and felt that he had a problem with marijuana, he described gambling as his “worst addiction” which led to “really destructive behaviour” (e.g., he could lose a month’s salary in a week). Because casino-style play is available on the Internet, at home James could easily combine gambling with marijuana use. He made his decision to receive treatment due to drug-related relationship strains, along with a series of financially disastrous gambling losses which made his lack of control self-evident and finally intolerable.

Ryan was a North American in his 20s. He described a positive family life, and his initial use of drugs was limited to weekend parties (e.g., where he used ecstasy and alcohol). An especially painful relationship breakup caused his drug use to

escalate significantly, and he described using alcohol, marijuana, and cocaine to excess as an intentionally destructive form of “self-medication”. He had tried other therapies (including Alcoholics Anonymous) without success. After surviving a serious car accident while driving drunk (which he saw as a sign that he needed help), he decided to apply for treatment in Takiwasi.

Mark was a South American public servant in his 30s (some of whose story was also presented in chapter 4). He described himself as a naturally depressive person, and recalled a turbulent childhood. His use of alcohol and marijuana started around the age of 17, although by his own estimation the most serious problems began in his 20s with cocaine. During a period where he was married, he had some success with Alcoholics Anonymous (as alcohol was always a precursor to his cocaine usage), although after his marriage failed he returned to the heavy use of drugs (including hallucinogens). Plagued by depression and insomnia, he had tried psychotherapy and psychiatric medication, yet in spite of these therapies he had attempted suicide by overdose. Before coming to Takiwasi, his life as an independent adult had collapsed, as he had returned to living with his parents after a manic episode in public involving LSD (from which he was fortunate to escape without legal penalty or serious physical harm).

Daniel was a South American in his late 20s. Like Paul, his family had relocated to South America when he was young. Not long after arriving, he suffered serious trauma due to an armed abduction. He described himself as suffering from severe depression from the age of 14 onward, although he was able to function as an adult and had been quite a successful sales manager. However, he described using cocaine to bolster a deficient self-esteem, which then enabled him to present an artificial self-confidence. As with Paul, he found that cocaine only provided these things temporarily, and soon after his original shortcomings would be intensified.

Unlike many other patients, Daniel had never used any other illegal drugs apart from cocaine. Similar to Luke, he mixed his drug use with pornography, but he also visited prostitutes who were open to cocaine usage (even though the drug’s effects often left him unable to have sex). Despite having tried psychiatric medication and mainstream addiction treatment, his problems had led to his dismissal from work (for theft), relationship breakdowns, multiple suicide attempts, and financial hardship (including several large credit card debts). Daniel saw Takiwasi as a last resort.

Andrew was a European in his late 20s who had worked as a professional (although he found his career to be deeply unfulfilling). While having a history of drug use (and an alcoholic father), Andrew did not see himself as addicted or having a serious drug problem (although he did state that he had been smoking and selling a lot of marijuana). His interest in Takiwasi was prompted by his psychotherapist in Europe, who was apparently an ex-Takiwasi patient. Andrew

described a family history with many frustrations and some instances of violence, and he felt that his primary aim in Takiwasi was to solve emotional and familial problems.

Isaac was a European in his 20s. He had been a university student, during which time he started smoking marijuana at parties without any troubles. After a period of life difficulty (including relationship, family, and university grade problems) his marijuana use increased markedly for around a year, which initiated a period where he described himself as “failing at everything”. Despite taking a one-year break from smoking in order to work and regain control over his life, he eventually took up smoking again—although this time even more heavily than before. Living at home without a job, he described himself as a “parasite” and a “vegetable doing nothing”. Finally, he came to the realization that he could no longer function in daily life without marijuana, and he applied for treatment in Takiwasi (a decision which was partly influenced by a television documentary; “*L’ayahuasca, le serpent et moi*”, 2003).

Patient life in Takiwasi

Before presenting the actual treatment techniques used in Takiwasi, it is necessary to comment on the general experience of patient life (and my own ethnographic relationship to it). One conspicuous issue with all therapeutic communities is the extent to which patient changes are in fact transient effects of the community environment. For example, with respect to the therapeutic community model, it has been hypothesized that “some changes may simply be related to the fact that recovery can perhaps be reached [...] with the mere passing of time while living in a beautiful jungle setting” (Bouso & Riba, 2014, p. 106). Life in Takiwasi is a little more complex than this however, and inpatients live under a consistently felt structure that can at times be quite stressful.

Hierarchy

According to Horák (2013), “Relationships in [Takiwasi are of a] horizontal character. There is no hierarchy among patients” (p. 30). While this is true with respect to the patients alone, as a group they are situated within a definite hierarchy of control (which of course must exist in some form for the institution to function). In general, patients have very few possibilities to change even mundane aspects of the treatment, and the extent to which they are able to establish relationships with others in the centre is managed.

This hierarchy also extends to researchers, who certainly have more freedom than patients, but who are still restricted in many ways. In order to have any meaningful ethnographic insight into daily patient life, one must deal with the Takiwasi apparatus, whose initial interface point is the psychological staff. In my own experience, negotiating observational access to various treatment

aspects was usually a very slow process with occasional allowances (with inpatient willingness to have me present being more or less irrelevant). For example, at the very beginning of my fieldwork I was surprised to find that I was expected to spend most of my time in an office room—being visible around the centre was discouraged unless I had a scheduled appointment. At the same time, Takiwasi features the bustle of a South American organization where staff are constantly busy, so these restrictions are not necessarily apparent to an outside observer.

Over time, the limitations placed on me were relaxed somewhat, particularly once I had acquired the dual role of researcher/patient (i.e., I was engaged in a therapeutic process with plants and had been assigned a psychotherapist). Although initially difficult for me to understand, a large part of the reason for restriction from patient life is that outsiders are seen to be potentially hazardous: As Jacques Mabit put it, “With the perspective of 25 years, I am simply amazed to see to what extent we rational westerners who deny or ignore [the spiritual] dimension are ‘infested’ by malignant spiritual forms, which are frequent and the source of pathologies” (Apfell-Marglin, 2007, p. 33).

Of course, in addition to these concerns, there is the more straightforward organizational desire to protect the inpatients from unknown individuals and researchers who might disturb the therapeutic processes in various inadvertent ways. Thus from the viewpoint of Takiwasi healers, being restricted from patients is an energetic, spiritual, and behavioural hygiene ostensibly performed for the benefit and protection of both patients and researchers alike. Many restrictions within patient life revolve around such logic, as well as the view that addiction patients in particular require clear behavioural boundaries.

Daily life stress

The rigid structure of Takiwasi can be a source of stress. In speaking about the way that inpatients are treated in comparison to outsiders (e.g., interpersonally, or in the foods that each group has access to), Ryan felt a frustration but also acknowledged some utility:

Ryan: There’s also dieters, who they treat completely differently than the patients who are in here for nine months. They’re actually a hundred times nicer to them. They get teas whenever they want, bread with butter, they enjoy all that—but we can’t.

David: How does that make you feel?

Ryan: It’s kind of unjustified, but at the same time I see it as discipline. I mean, the way I’ve been running my life is that I don’t care, I do whatever the fuck I want. So it kind of does teach you some discipline.

Many of the usual pleasures of life are denied to Takiwasi patients, although these denials would be explained by staff as having energetic reasons. But there are myriad ways in which the patient’s life can be difficult:

Mark: Well, the bed is not the best bed, and it's not the best breakfast, and you have to wake up early, and you have to work a lot. You also can't choose the people you live with: When I first got here I saw people as crazy as me, or worse! I thought, "Wow, we're all like sick brothers here". Now it's become familiar to me and I feel a kind of friendship with everybody, or with most.

But working here is hard. And soon I will go for lunch—chicken with rice—again! Right now I'm in post dieta, so I can't eat any sugar, for two fucking weeks. It's tough. So why am I doing that? Because I have to do it. I really want to cure myself. I won't abandon it, that I'm sure of.

Luke also described the inpatient environment as something potentially strenuous, but like Ryan, he was able to link that strain to a positive treatment aspect:

Luke: In a place where you live with 15 people, it's high pressure. You have nowhere else to go. You can't go out, and you don't even have cigarettes. The only thing you can do is talk to your therapist, and that forces you to go into yourself and see what's really going on.

Quitting the treatment

In many ways, these stresses combined with the difficult nature of the treatment itself contribute to a relatively high number of early treatment exits:

Luke: When I arrived here, I was very sceptical. Lots of mosquitoes were biting me, and then they gave me the purge. The first one was saúco, and I'd never done that in my life—drink a plant, drink water, and then vomit. Drink water and vomit again. I was looking outside and seeing all this green, and I said, "Man, where have I ended up?".

The nature of the treatment can certainly come as a shock to new patients. However, the most common reason for treatment retention (despite the difficulties) is the feeling of making progress. In fact, Takiwasi does not consider the patient's treatment to have fully begun until the first ayahuasca session, and indeed, this is often the point where patients make the decision to persevere. For example, Isaac was planning to quit very early on in his treatment:

Isaac: I was going to talk to my parents, tell them what the situation was, and when I'm leaving. But I never did that.

David: What changed?

Isaac: I just realized that the treatment was working. Like a lot more than I could have expected. It happened after my two first ayahuasca

sessions; they had a really, really strong effect. I'm not talking about during the session, but after. It's like bread, you roll up the dough, but the bread rises alone. It was like that. The ayahuasca rolls you up during the session, and then you start to rise. Those plants make you realize stuff.

I don't know if you can really cure yourself from an addiction, but you can understand why you did it, and why you don't want to do it anymore. What was crazy though was I could see the change. Often you change but you don't notice it—here I could see it. So I was like, yes, it's worth it.

The essential message here is that while life and treatment in Takiwasi can be hard work, patients often perceive enough benefit to give them the will to continue. The specific techniques through which this occurs (some of which have already been mentioned in the preceding quotes) will now be clarified.

5.2 Treatment Techniques

In Takiwasi, the ideal treatment progression would first attend to the physical, followed by the psychological, then the familial, and finally, the spiritual and existential (J. Mabit et al., 1996). This structure is somewhat reflected in the treatment accounts provided by Horák (2013) and M. Mabit (1996), but as outlined earlier, a complete description of the treatment and its structure will not be attempted here. Instead, the major treatment components will be discussed along with examples of their significance.

Clinical

The first step in the treatment, clinical testing, is decidedly Western and deals exclusively with physical ailments and conditions in a biomedical fashion:

The first two months of the treatment are basically dedicated to physically rehabilitating the patient. At the health center associated with Takiwasi, [the patient] receives a comprehensive medical examination including laboratory tests on blood, urine and feces, HIV and hepatic tests and screening for intestinal parasites. (M. Mabit, 1996, p. 1)

Although it does not generate much special interest for patients (and was rarely commented on), this first step forms an important aspect of Takiwasi's medical pluralism:

David: [A patient] recently left for hospital because of a medical problem. Is it difficult to determine, say, whether a problem is physical or spiritual?

Jaime: It's not so difficult. We have a medical doctor who performs clinical analyses to ascertain the physical condition of each patient on arrival. [This particular patient] came with medical antecedents; colic from gallstones. Most often the patients' physical health improves. But in this case, the gallstones began to affect the pancreas, leading to pancreatitis. That's a specific health problem—organic—it's not an energetic, spiritual, or psycho-affective condition. Treated with only traditional medicine, it's possible that he could have died. Western medicine provides the restrictions for specific characteristics, and especially so for Western patients. For example, if a patient with diabetes arrives here, the doctor will not allow him to take yawar panga.

The initial clinical testing occurs while the patient is in *aislamiento* (isolation); which is the treatment entry point for new patients. Isolation usually entails around one week of separation from the main patient group, with the only social contacts being therapeutic staff members. Apart from the mandatory initial screening during the isolation period, patients are required to visit the external medical clinic from time to time, for instance if intestinal parasites have been contracted (an occasional and unpleasant reality of jungle life).

Traditional

Those techniques that can be categorized as traditional are, in most cases, the primary sources of patient change in the Takiwasi treatment. Within this group of techniques, there are two defining characteristics: (a) the ingestion of plant extracts (with only the *temazcal*, or sweat lodge, being excepted); and (b) the use of shamanic techniques, most prominently the singing of sacred songs or chants (which are known as *icaros* in the Amazonian context).²

In Takiwasi, a large variety of plants are used depending on the patient and situation. There is certainly insufficient space for a detailed discussion of every plant, but it is enough to say that each one is seen to have its own spirit,³ indication, and use. For example, *ushpawasha sanango* (*Tabernaemontana undulata*; Sanz-Biset & Cañigüeral, 2013) is believed to aid one in connecting with emotional memory, *ajo sachá* (*Mansoa alliacea*; Sanz-Biset et al., 2008) in promoting independence and the discernment of boundaries between the self and the other (e.g., between authentic personal impulses and those of the family, society, and so on), and *palos* (a mixture of various tree barks) in providing physical, mental, and spiritual fortification.

²Hence the name *Takiwasi*, which translates from the Quechua to “Singing House”.

³For example, according to Mabit: “Each category of plant possesses a collective spirit, a tutelary entity that can strongly be assimilated to the angelic functions of the Christian tradition. Such entities preside in species of living beings (plants and animals), in natural places, in human collectives, in psychic functions and in spiritual functions” (Apfell-Marglin, 2007, p. 35).

While variations in preparation and application surely exist, the plants used in Takiwasi are not idiosyncratic to the centre: Horák (2013) has compiled a listing which can be compared with the extensive work of Sanz-Biset et al. (2008) on medicinal plant usage in the Chazuta valley region (and see Sanz-Biset & Cañigüeral, 2011, 2013; Sieber, 2003). The *vegetalismo* and indigenous heritage of the plants used in Takiwasi is also suggested by the significant overlap with “plants that teach and guide” in east-central Peruvian shamanic initiation processes (Jauregui et al., 2011), as well as Luna’s listing of plants that “teach medicine” based on reports from four Peruvian *vegetalistas* (Luna, 1984a, pp. 140–141).

Regarding the use of *icaros*, these chants have been described in the context of indigenous and traditional mestizo uses (Andritzky, 1989; Luna, 1984a) as well as contemporary mestizo healing ceremonies (Bustos, 2008; Fotiou, 2012), and might be most aptly characterized (at least from the *vegetalista*’s perspective) as a form of inter-species communication (Callicott, 2013). While *icaros* could be considered from a Western perspective as placebo enhancers or a form of music therapy, they are indispensable within traditional Amazonian medicine. Likewise for Mabit, the *icaro* is viewed as essential, and even primary:

In the Amazonian tradition, songs called “*ikaros*” accompany the therapeutic sessions. [...] What appeared to me is that it is really the song that exercises the central therapeutic function in all these ancestral practices. These songs are inspired through dreams or during *ayahuasca* sessions or sessions with other teacher-plants. (Apfell-Marglin, 2007, p. 43)

In Takiwasi, *icaros* are sacred songs (hence with purported origin in the spiritual world) which operate primarily at the energetic and spiritual levels. The function of *icaros* specifically within Takiwasi has already been described in some detail by Bustos (2006). Without attempting further analysis, *icaros* are present in all of Takiwasi’s ritualized therapeutic plant sessions, along with other well-known techniques such as the *soplada* (the blowing of smoke for energetic manipulations) and the *chupada* (the removal of bad energy via sucking; which is seen comparatively rarely).

Containment plants

Containment plants, known as *plantas de contención* in Takiwasi, are mild plant preparations which the patients drink on a nightly basis (for a listing see the appendices in Horák, 2013). They are generally intended to prepare the patients for the *ayahuasca* sessions and dietas (Labate et al., 2011, p. 226), although each plant has a specific purpose. For example, *albahaca* (*Ocimum* sp.; Jauregui et al., 2011) is used to promote dream recall, *mucura* (*Petiveria alliacea*; Jauregui et al., 2011) for energetic protection (often being used prior to *ayahuasca*

sessions), and *camalonga* (*Strychnos* sp.; Jauregui et al., 2011; Rätsch, 2005) for the treatment of energetic disturbances (Labate et al., 2011; M. Mabit, 1996) and the intensification of dreaming (likewise often being used before an ayahuasca session). The plants are provided to patients in much the same way as a Western doctor would prescribe a medicine; there is no overt ritualistic element involved during administration, and only *camalonga* carries special dietary restrictions.

Purges

The *purga* (purge) is the first major traditional technique that a new Takiwasi patient will be exposed to. In the terminology used by Sanz-Biset and Cañigüeral (2013), these purges are “mild depurative practices” (i.e., they last no longer than a day, entail only moderate calorie restriction, and do not require either social isolation or salt restriction). The experience of the purge itself however, is not mild. The basic process involves drinking an emetic plant substance followed by copious amounts of water; the combination of which induces vomiting (usually of at least three or four bouts). There are a number of different purge plants used (Horák, 2013), and there is also a hierarchy of difficulty which roughly begins with *azucena* (where no water consumption is required), *rosa sisa* (*Tagetes erecta*; Rätsch, 2005; Sanz-Biset et al., 2008), and *saúco* (*Sambucus peruviana*; Sanz-Biset et al., 2008) at the easier end, culminating with tobacco⁴ (*Nicotiana* sp.; Charlton, 2004; Jauregui et al., 2011), yawar panga, and *purgahuasca* (see description ahead) at the difficult end.

Purges are held during the day in a group setting, with patients seated in a semi-circle around the curandero, usually inside the *maloca chica* (small hut). Each patient is provided with a small wooden seat, plastic bucket and water jug, and some paper towel. One by one, individuals are called to drink the purge plant that has been prepared for them, and shortly after they are called again to collect water. Once everyone has drunk their plant extract and has a jug of water ready, the drinking begins. Not long after, so does the vomiting. During this process, the curandero sings icaros and from time to time attends to each patient individually, enquiring about their state, and performing various ritualized gestures (e.g., making the sign of the cross on the crown of the head). After a particular patient has finished, the curandero closes their session with a *soplada* and the spitting of an aromatic mixture over the body, and then the patient is free to go (after emptying and cleaning their bucket outside).

In the context of the treatment, the purges are the main method of cleaning an individual (see chapter 4) and preparing them for deeper plant work (i.e., to enable greater revelatory potential). Mabit described the purpose of the purges in the following way:

⁴Tobacco purges have recently been associated with a number of tragic deaths in Peru (Macdonald, 2017; Purdy, 2015). In Takiwasi, a tobacco purge is considered to be difficult, and it is introduced slowly over the course of treatment (e.g., initially as an admixture with easier purge plants).

Even vegetarians with pure diets are charged with emotions, habits, memories, anger; things that have not been metabolized. We even inherit loads from our ancestors, from places we go and people we meet. Purges in a ritualized context allow a person to get rid of this, opening up the subtle body so ayahuasca can go deeper into one's being. It avoids wasting an ayahuasca session with cleaning tasks, allowing us to work with essential themes. Purging is a very important preparation. We didn't invent it, Amazonian traditional medicine has numerous barks, roots and concoctions for purging. Each one with a specific effect. (D'Aguiar & Zahlten, 2015)

For the uninitiated, purging is extremely arduous and unpleasant, yet it does become somewhat easier over time:

David: How were your purges with tobacco?

Mark: Very difficult. I remember the third or fourth time here in Takiwasi that I purged tobacco—I felt like I was going to faint. I was also sweating a lot, and I had to stop drinking because I was dizzy. So I had some fears about that. But my therapist and the curandero said that if the plant is difficult then I should persist with it. And actually, over time I began to have another relation with it, and I discovered that the plant works very well for me. When I'd go to bed afterwards I'd have clear thoughts about who I am, for my family, for the people I love.

David: With the same tobacco purge?

Mark: Yeah. And now if you asked me what plant I want to purge, I would say "tobacco". I really want it, even though it's very difficult.

Jules, who voluntarily exited after two months, actually found the purges to be the most useful aspect of the treatment:

David: Do you think the purges were helpful for you?

Jules: Yeah, they were very effective. I think the purge was actually the main part of the treatment for me.

David: More so than the ayahuasca sessions?

Jules: Yes, but I see the ayahuasca like a purge as well because it cleaned out my body—which was very, very dirty—and it just felt so good to throw that out.

While there is a definite qualitative difference between the purges and an ayahuasca session in that most purges are not powerfully psychoactive, the concept of purging itself is a fundamental theme that runs through the traditional techniques in Takiwasi (and mostly equates with cleaning or purification). Patients with

opiate addictions seemed to speak particularly highly of the purges, and there has been at least one report of craving attenuation in opiate addicts (Schreiber; as cited in Loizaga-Velder & Loizaga-Pazzi, 2014) after the use of natural emetics at an addiction treatment centre in Thailand (Osborne, 2015).⁵

It is not necessary to describe every type of purge used in Takiwasi; however, one plant that requires special attention is yawar panga. This plant is an exceptionally strong emetic, and while those on the mental health track might gradually work towards it (e.g., in my case it was the final purge plant given to me), the inpatients receive it relatively early in the treatment. Initial experiences are nearly always dreadful, yet appreciated afterwards:

James: The first one just knocked me out. I puked quite a lot during the purge, and after that I could chill in bed a bit. Then the therapist came to give me cinnamon tea. One sip completely destroyed me—I puked and went to the bathroom for four hours and I couldn’t stop. I wanted to die, it was horrible, horrible. You get up and you puke bile. Yeah, it was really a tough one. But also, it’s the most efficient one. And that’s the good point. I can say that the second and third times I had yawar panga I was much, much mellower, much better.

Luke shared a similar experience:

Luke: But when I purged the yawar panga, I nearly died. After vomiting all the water in the session, I went to isolation and kept vomiting from six until two in the morning. And these eight hours, it was just bile. I couldn’t speak the next day because my throat was burnt. But I’d never felt so good, I felt like my blood and my body were somehow cleaned. And then with the purges, I started to shake off all the abstinence feelings.

Other patients had similar stories, and my own experience with yawar panga corroborated the patient accounts. Reports of positive affect in the days following the purge are common, and given recent research into the gut-brain mental health link (Foster & McVey Neufeld, 2013), there may be some important but as yet poorly understood biological mechanisms associated with these purges.

Ayahuasca

As detailed accounts of the Takiwasi ayahuasca session are provided elsewhere (Bustos, 2006; J. Mabit, 2007; J. Mabit, Campos, & Arce, 1992; J. Mabit et al., 1996), only a cursory description will be made here, with the primary focus remaining on patient perspectives and the function of the healers. In preparation

⁵Incidentally, this centre (known as *Wat Thamkrabok*) played an important role for Jacques Mabit during the development of Takiwasi (J. Mabit & Sieber, 2006).

for a session, foods with salt, sugar, fat, and spices are avoided (although such austere meals are commonplace in the patients' diet). Fasting is optional, yet no foods are consumed after a light lunch on the day of the session. Sexual activity, including masturbation, is also prohibited (once again, this is a general condition of inpatient treatment). It is also recommended to take a *baño de plantas* (herbal bath) just prior to the session. While these taboos are well known (Labate, 2014), in Takiwasi they are explained not as measures for the sake of tradition, but as necessary practical procedures which regulate a person's physical and energetic body (and hence subsequent relationship to the spiritual world within the session).

Sessions take place at night in the *maloca grande* (large hut; for a photograph see Horák, 2013, p. 60), with participants in a semi-circle (including the healers and the priest). After some ritualized preparations (e.g., censuring), each individual is called by name to receive and drink ayahuasca. The lights are then turned off, and the session begins with chanting and icaros. Depending on the progression of the night, a second cup of ayahuasca may be offered, but in either case the singing continues for quite a number of hours (although at times punctuated by silence and the treatment of certain individuals with *sopladas*, etc.). It is worth mentioning that the sort of initial chaos (e.g., defecation in the session) described by Gearin (2015) is not generally seen, probably due to Takiwasi's focus on alimentary preparation and the extensive prior use of non-psychoactive purge plants (e.g., many of which tend to have a laxative effect). However, while patients are strongly encouraged make all attempt to minimize noise and disturbances for others, there are "difficult sessions" where an individual may be unable to control themselves (e.g., in the case of hysterical panic, or an experience of possession).

Patient perspectives Before presenting a selection of patient ayahuasca experiences, it will be useful to reiterate the Takiwasi position that the healer maintains a crucial function in the session:

He acts as the orchestra conductor. His role consists of modulating, regulating, [and controlling] this complex dance of factors, harmonizing the energies in play. Without a doubt, the quality of his own energy determines the result of the session. The basic energetic modulation is transmitted through the sacred songs. His body is the therapeutic instrument par excellence, beyond constituting the element of his own initiation. (J. Mabit et al., 1992, p. 8)

Thus the following patient accounts took place within a well-defined and ritualized container that is unique to Takiwasi (however it might be analysed). Within this structure, patients often recount ayahuasca experiences with reference to some form of symbolic psychological insight (and see Labate, 2014; Shannon, 2010a):

Isaac: They say here that to take ayahuasca is to go through the storm. I had two sessions where I felt pain for hours. I mean it's also a process where you have to vomit to cure yourself. So no, it's not something pleasant. I have to say that, because I think it's important. But ayahuasca helps—it's like a microscope—it focuses on what you have inside you.

In one session I felt the ayahuasca taking, like a demon away from me. I could see him; dark skin and red eyes, very thin. But during the session I realized that I was feeding that guy with my thinking. The more depressed or angry I'd be, the stronger he was, and the more I would think in that negative way. It was like creating loops in my thinking. So for me, all that hellish stuff is very symbolic, it's to make you understand how you are functioning.

This sort of personal insight can take myriad forms. The following example involves a kind of temporary possession along with the feeling of directly accessing another person's consciousness:

Luke: With the first ayahuasca nothing happened. They told me not to worry, because even if you see or don't see, it works. But on the second ayahuasca, I saw what it is. The colours when it first comes, geometrical patterns, and then I felt that something inside started talking for me.

David: You were speaking out loud?

Luke: I was actually speaking in the session, but it wasn't me, I can't explain it. It was speaking for me.

David: What sort of things was it saying?

Luke: Well, the person I was, it was judging me. Real bad. I saw like a movie of everything I'd done. It was showing me things, especially with my kids. It moved me a lot because I got into my eldest son's mind, and I, had the feeling that he had when he saw me that way. I was in his mind, looking at me and his mother arguing, and me smashing stuff. I felt what he felt. So when the session finished, I was aware. And crying, like I never did in my life, I was crying like I was the worst criminal ever. I could see the damage I was doing. And basically all the sessions were like this. They were all showing me something.

As alluded to in chapter 4, it is reasonably common for insight to spill out beyond the psychological, taking on forms that might even fall under the classification of “paranormal” (Luke, 2012; Winkelman et al., 1982). One therapist told me that this was a familiar occurrence in Takiwasi: patients (and

staff) often gained access to information about things that they should not, on classically cognitive grounds, know about:

Daniel: My second ayahuasca was amazing; it was very strong. I felt that I was in my mother's womb, and I was aborted, and then I was born. I saw it, I felt it, I smelled it, I touched, everything. I was there in the womb. And I was shocked as hell. I was like, OK, I don't know where this is coming from. After the session my therapist recommended finding out if my mother had ever had an abortion. So he wrote her an email, and it turned out that yes, a year before I was born she'd had an abortion. I had no idea. I had no idea. But due to that, I became more and more interested in these things.

Of course such experiences can be explained by pure chance (or prior knowledge), but for Takiwasi staff and patients, these ostensibly chance events take place with a much greater frequency than is usual. Within the centre, comparable events may be interpreted as genuine revelations, although only when some kind of real-world synchronicity or factual verification is also apparent.

Difficult experiences are also commonly encountered, particularly early on in the treatment. The following excerpt demonstrates not only the potential difficulty, but also the value of present and capable healers (especially so within a substance abuse population, where early life traumas are frequent):

Mark: My first session was the worst, even though they only gave me a little. At the beginning I felt like I was on LSD. I was seeing lights and I thought, "Wow, psychedelic! This is awesome!", and I was laughing. You aren't supposed to make noise, but I couldn't stop. I really wanted my friends to feel it. Halfway during the session they offered more, so I went and they gave me the second one.

After that I began to feel a pain inside, and suddenly a panic rushed up on me; it was like I was dying. And it wouldn't stop. I stood up and shouted, "Please! Enough I don't want it!". I forgot that I was in the session—I felt like I was in Hell. I saw it, I heard the burning, and I saw the demon. I could hear the voice of the other curandero saying, "Mark, please sit down, listen to the icaro", and they gave me a *soplada* with tobacco. It was very good to calm me down, because it was really like a panic attack, but more like a hundred panic attacks at the same time.

So I took my seat again, but I was crying. I felt like a young boy, actually I was a young boy, like five years old, I felt like me at that time. Both my father and mother hit me a lot when I was growing up, and I was reliving those feelings. I cried and said, "Please enough, enough, enough", like mercy to my mother. At that moment the curandero was finishing the curación, and he hugged me and gave me a kiss on

my head. It was like a cure for my soul because it was what I really needed in that moment—even though I didn't ask for it.

It is already obvious from these examples that the ayahuasca experiences in Takiwasi do not always directly relate to drugs and addiction—in fact they very often do not. However, the experience of gaining insight into one's behaviour (along with perceived healing) is nearly always linked back to addiction, and it is the therapeutic significance of what Takiwasi calls “psychological restructuring”:

Mark: Now here in Takiwasi I'm starting to learn how to do it, or to say, “You can be loved. You can receive love”. Why not? Because all my life I thought that I didn't deserve love, from anybody, including myself. And that creates a lot of suffering. But I'm changing it. I recognize that I had problems with drugs, but I had problems that were there before that too, and here I'm working on those kinds of problems without pills or antidepressants.

Although patient experiences are often framed in psychological or therapeutic terms, there are cases that evoke spiritual or religious terminology. These experiences can be difficult for people to describe, and are often of a deeply personal nature. The following account of James' first ayahuasca experience demonstrates a striking introduction to a world where therapeutic language alone appears to be inadequate:

James: For my first session they only gave me a small amount, and I was frustrated thinking that it would be a waste of time. But I'd heard about communicating with the plant, so after half an hour I decided to give it a chance. I asked the spirit of the plant if I could enter its world, and the spirit said “yes”, and from there—through the roof. I was having kaleidoscopic visions.

David: With your eyes open or closed?

James: I tried both, it was the same. The maloca roof was like a mosque full of precious stones surrounded by every colour: gold, red, blue, sapphire, ruby, whatever. At first I was completely ecstatic, I had a huge smile and I was crying looking at so much beauty; but this beauty quickly became unbearable. Completely overwhelming. I got the feeling that I was losing control, like the spirit of the plant took possession of my body and I was helpless—I realized I was trapped. Then I thought I was going insane and would never come back. Terrifying. I called the session leader and he came and helped me, gave me a couple of *sopladas* of tobacco, *soplada* of camphor.

David: Did it make a difference?

James: It helps a lot. I was picturing him like fear of God you know. Presence like a rock. He was holding me like this. And his breath was

mine, like it was, how could I say, he was putting oxygen in my body by doing that, and I could feel all the strength of his work, of what he was doing, it was amazing. And it really helped me, but it was not enough.

After this James was taken to have a shower, during which he had a strong sense that ayahuasca was punishing him for his past lack of respect towards sacred plants (specifically his recreational use of marijuana and psilocybin mushrooms). The shower helped him to reconnect with his body, although an apparent spiritual dimension then became visible:

James: From there I was good, I was down on earth, but it was not over at all and I started to see spirits everywhere. I had Paul to my side, I saw the spirit of his father who was next to him, all the time, putting his hand on his head. When the time for the curación came, I saw the curandero but I also saw a spirit next to him and they were always working together. Also, I saw that the session leader was sitting down, but at the same time he was turning around visiting each one of us, and I was convinced that it was him, like his physical body, but when I went to touch his leg, my hand passed through. It was, you know, completely inexplicable. I was like, “What the hell is going on?”. And I’m telling you I could see him almost as clear as I see you now, but in the dark.

The concept of spiritual entities assisting in healing work is routinely encountered in *vegetalismo* (e.g., Luna & Amaringo, 1999, pp. 102–103), although James’ experience is just one example where the focal point is not related to therapeutic introspection. Indeed, such experiences may prompt a reconsideration of one’s relationship with spirituality, and on that topic, further discussion will be provided ahead.

In general, the ayahuasca sessions are valued, with Takiwasi records showing that 88% of experiences are considered by patients to be important treatment events (from 1,074 records). However, as a final point of consideration, there was one patient during my fieldwork for whom ayahuasca had little effect (apart from some physical discomfort). The only time Andrew felt anything out of the ordinary was during his very last ayahuasca session, as he described feeling energy flowing in his hands and feet after an intervention by the curandero. Because I did not have the chance to interview Andrew again before he left Takiwasi, I contacted him about a year and a half later to follow up. He told me that after leaving he had never again participated in another ayahuasca or ritual session, and had come to the conclusion that it was not something with which he was compatible. For Andrew, treatment in Takiwasi had not been of great life significance.

Purgahuasca

Whereas ayahuasca requires the consumption of only a small amount of liquid, the purgahuasca ritual in Takiwasi involves drinking as much as three litres of a warm and extremely bitter tasting decoction. The purgahuasca brew contains caapi, but not chacruna, so there is less DMT in the mixture (if any). Small amounts of other plants may be added (e.g., tobacco), and although I encountered conflicting reports regarding the precise contents of the brew, there was a consensus that it is primarily caapi. For this reason, the ritual seems closer to the communal ceremonies described by Luna (2011), although it is derived from the Awajún⁶ people (Brown & Bolt, 1980; Greene, 1998), where it was traditionally used as a rite of passage.⁷

The purgahuasca ritual in Takiwasi is conducted at night in the maloca chica, although the lights remain on during the session. The sheer volume of liquid consumed makes vomiting inevitable, and the effects can be very strong (locally known as *mareación*, which is closest to “dizziness” in English). Whether visions are induced seems to depend upon the individual; however, with purgahuasca the visionary element becomes secondary to the internal journey. In some cases it can be more difficult than an ayahuasca session:

Daniel: One of my purgahuascas was the most difficult experience I’ve ever had. I saw my darkest—the Father called it “the devil”, and the curandero said it was my “demons”. During the purgahuasca I felt awful, not physically, but emotionally. I felt sunken into my own abyss. I saw all the bad things that I’d done, I saw how I made people feel, I, felt it. I felt myself actually jumping from a hotel room, and someone telling me, “OK, that’s the point I wanted you to reach, finally you’ve reached it. Killing yourself”. I was in tears. And I saw many things, like moving energies, and stuff like that. It was my toughest experience.

In my own experience, I found purgahuasca to be especially demanding not only physically (with vomiting sometimes continuing on well after the session had ended), but also mentally and emotionally. Yet while difficult, there was a certain clarity and directness to the process; the purgahuasca experience seemed to “speak for itself”, and needed less interpretation. From 143 Takiwasi patient records, 83% of purgahuasca experiences were felt to be important treatment events, even though visionary elements were not always present.⁸

⁶Also known as the Aguaruna.

⁷Although more recently it is used as a remedy for recalcitrant teenagers (Torres, 2009; as cited in Horák, 2013). At least in the 1980s, Awajún adults considered a lack of rigorous training with hallucinogenic plants to contribute to antisocial behaviour and generally acting “without thought” (Brown, 1986b, p. 49).

⁸Visionary elements were reported in around half of the purgahuasca sessions (49%), compared with 71% for ayahuasca sessions.

Dietas

The last traditional technique to be discussed is the *dieta* (diet)⁹. Although Takiwasi is well-known for their use of ayahuasca, the dietas are actually considered to be of greater importance in the treatment (Berlowitz et al., in press; J. Mabit, 2007). In Takiwasi, dietas are conducted in a very similar manner to that found in the nearby Chazuta region (Sanz-Biset & Cañigüeral, 2011). The dietary and behavioural taboos are stricter than with ayahuasca sessions (e.g., strong odours must also be avoided), and they remain in place for two weeks after the dieta (known as the *post-dieta* period). The local understanding is that breaking these restrictions during the dieta or the post-dieta can result in either halting the desired effects, or becoming *cruzado* (crossed), which involves the experience of various adverse reactions (and in Takiwasi is explained as essentially an energetic problem).

For patients, dietas occur around every three months, and take place in the *chacra* (an isolated area of jungle terrain that Takiwasi owns). The dieta opens with an ayahuasca session on the first night, and upon conclusion of the ceremony each patient retires to their assigned *tambo* (hut). The next seven days are spent in social isolation, with food intake and physical exertion kept to a minimum. Each day helpers bring plant extracts to be drunk, with two plants being assigned to each individual for the duration of the dieta (based on perceived therapeutic need). The helpers also offer basic meals, which are optionally rejected if the patient wishes to fast.

Just before the final evening, the healer arrives at the patient's tambo and interrupts the dieta by providing a small amount of onion to eat. After receiving a *soplada*, the patient (who was previously isolated to his tambo and its immediate surrounds) proceeds to a hall area and shares food with the rest of the dieters, and this marks the end of the dieta and the beginning of the post-dieta period.

The principal idea of the dieta is to increase one's sensitivity, allowing for a deeper experience with the plants and also the psychological integration of all prior therapeutic work. In terms of the treatment, the dietas are intended to be points of deep inner reflection and integration:

Luke: Some of the dieta plants are psychoactive, others not, but somehow, they work. Physically and psychologically. You have the most vivid dreams ever on the dieta, you digest information there and you make decisions. You also see the therapist three times a week. The dieta is like a pillar where you consolidate that stage of your treatment. I see that as crucial.

Intense dreaming during the dieta process has been reported elsewhere (Black, 2014; Sanz-Biset & Cañigüeral, 2011), and was definitely the case in my own

⁹I prefer to use the untranslated Spanish term *dieta* in order to differentiate between the usual English meanings of *diet* and the traditional Amazonian technique.

experience. As with ayahuasca, the psychological content of the dieta is not necessarily related to substance abuse: According to 167 Takiwasi inpatient records, dreams involving drugs only occur in approximately 50% of dietas. The following account indicates a change of perspective that is not directly related to drug use:

Isaac: I used to eat a lot of fast food. Or like a bowl of rice with an egg—took me two minutes to do it. When I came back from the dieta, I changed my relationship with food. Before I was eating because my body was forcing me to. After the dieta, I eat because it's caring for my body and giving me energy. Caring for my body is caring for my life. It went little by little. Doing sport, eating better. I realized that kind of stuff here in Takiwasi.

Although referencing nutrition, the underlying drive of this change in perspective (i.e., an increased value placed on one's body and life) is obviously a useful therapeutic change in the context of addiction treatment for a patient that was smoking marijuana heavily and struggling with life motivation and interest. In many ways, the dietas are seen to hold a unique practical utility:

Daniel: Ayahuasca, purgahuasca, even the purges, they help you in a more ethereal kind of way. But dietas help you ground yourself actually. I think the best thing that happened to me here was the dietas. They gave me a chance to explore myself. You know, the few things that I managed to open up from my childhood didn't come from the ayahuasca—they came from the dietas.

Throughout my fieldwork, it was quite common for patients to describe the dietas as the most helpful part of the treatment. At the same time, there is work involved, and a dieta is not a matter of simple plant consumption:

Mark: For me the dietas are the best part of the treatment. Some of the plants are for fears, some for grounding your thoughts, with others you have dreams or memories about things that happened in the past which are at the root of your problem. That can be difficult because you might receive some information that is very distressing for you. But it's not a miracle plant. I think that you have to want to work and cure yourself with all your energy and your passion.

The experience of being isolated for days on end without distraction can certainly be difficult (electronic devices are not permitted, and reading material is kept to a minimum), and this alone would tend to induce introspection for most urban patients. However, the state of mind brought about by the dieta cannot be attributed to any single factor (e.g., social isolation, the plants' effects, limited food intake, etc.). According to Sanz-Biset and Cañigueral (2011), it is commonly

said that “the healing is in the dieta”; meaning that the beneficial effects come from the synergy of following the entire dieta regime and all that it entails.

In most cases, patients perceive the outcome of the dieta to be favourable in terms of their treatment. From 170 Takiwasi patient records, 89% considered their relationship towards the treatment to be positive after their dieta. Nine percent were neutral, whereas only 2% felt negatively about their treatment after the dieta.

Ritual

Although I did not personally witness them, Takiwasi conducts a number of rituals for patients (i.e., beyond those of the therapeutic plant sessions), some of which appear to be idiosyncratic to the centre. These rituals are described to an extent by Horák (2013), and include for example digging one’s own “grave” and being buried underground (with only a thin tube for breathing remaining above the surface). Very often, the ritual or symbolic content has its genesis in treatment experiences. For example, it is customary for inpatients’ to have their head shaved shortly after arriving at Takiwasi, and this was apparently introduced after a group of patients proposed the idea to symbolize starting anew.

As a more elaborate example, Takiwasi occasionally performs the *ritual de reparación de los niños no nacidos* (ritual of atonement for unborn children), which is primarily for women, but is also recommended for men who have helped to conceive a child that was aborted. Takiwasi provides a lengthy document (presently in Spanish only) which locates the origin of the ritual in the ayahuasca experiences of a French woman who was dying of cancer. Without going into great detail, the woman had had an abortion in her early 20s, and throughout her adult working life as a nurse had performed numerous clandestine abortions.¹⁰

As her condition was terminal, her motivation for drinking ayahuasca was not physical healing, but rather was to understand the reason for her illness (in an existential sense). In her first ayahuasca session in Takiwasi, she received visions with symbolism relating to children and the Nazi swastika. She also received indications that the children she had aborted still existed in the spiritual realm, that they were “blocked” there (since they were never able to be properly born), that she was in some way culpable for this, and that this was all related to her own illness.

During her second session, she was instructed to perform a ritual for the children’s liberation, which she later carried out, and in her third and final ayahuasca session she saw a vision indicating spiritual liberation for the children.

¹⁰At the time abortions were illegal in France.

During this last session, the woman was also told by an entity¹¹ that she had been spiritually cured, which apparently brought her peace, although she died a number of months later. Her ritual for unborn children is the one that Takiwasi still conducts. This example, while not strictly related to addiction (although it could be recommended for certain inpatients), is illustrative of the manner in which ritual within Takiwasi evolves over time; with revelatory material from plant work becoming a source of knowledge about the world.

Psychotherapy

It is quite difficult to discuss the individual psychotherapy practiced in Takiwasi, since its essence is found in private conversation. However, it is fair to say that the therapy cannot be analysed apart from the use of ayahuasca and traditional medicines. James, in talking about life in Takiwasi since his dramatic initial ayahuasca session, commented on this relationship:

James: It's really been a lot of ups and downs. The ayahuasca is always a very good ally to centre myself a bit more, to not be distracted by issues in the convivencia, and to remain focused on my own problems and what I need to work on. Combined with the therapy I see that it's a great help. The session can be really strong, but in the days after you realize how much progress it brings you to do this work with the ayahuasca, the therapist, and everything. It's like five years of basic psychotherapy in Europe as they do it, you know it's such a giant path that you make.

David: And how do they work together? Do you bring material to the ayahuasca?

James: Yeah, yeah. Each week you know that Tuesday or Friday you will have ayahuasca, so you have an objective; for me it structures the treatment. Afterwards you have a couple of days to settle a bit and try to process everything. Then you have sessions with the therapist, which will perhaps give you elements that you couldn't perceive yourself. During the week you think about what you've seen and what you've talked about with the therapist. It really helps a lot.

Ryan also made a comparison between Takiwasi and his past therapy experiences back at home:

¹¹Which she perceived as a large mouth identifying as "the mouth that pronounces the truth". On receiving instruction during ayahuasca sessions, Shannon writes: "Typically, the person under intoxication feels that a voice is addressing her and passing information[...]. [Often] the code being deciphered is not phonological-linguistic but rather ideational, and the perception is not auditory but, in a fashion, telepathic" (Shannon, 2010b, p. 105).

David: How do you find the combination of therapy with plant work at Takiwasi?

Ryan: It's actually really good. I mean I had therapists before I went to Takiwasi. I already realized I was a drug addict, drinking every day, smoking weed every day, doing coke every two, three days. But when I spoke to the therapists, I kind of convinced myself that I'm all good, but then when I got out of there I was drinking and all that. Here it actually makes you notice the problems, and fight the problems.

While these quotes are complimentary, there are of course no guarantees of a positive therapy experience for patients. During my fieldwork there were Takiwasi therapists from a range of different countries and backgrounds, including Peru, Colombia, Chile, Argentina, Czech Republic, France, and Mexico. Patients at times expressed frustrations about their assigned therapist for various reasons, and they sometimes switched due to personality clashes, or the failure to form a satisfactory therapeutic relationship.

Apart from individualized sessions, there are also various group therapy sessions for patients, ranging from post-ayahuasca and post-purgahuasca sharing, to relapse prevention and dance therapy (*biodanza*; Carbonell-Baeza et al., 2010), through to the eccentric "family constellation therapy" (D. B. Cohen, 2006; McQuillin & Welford, 2013). The effects of the plant work are indirectly connected to all of these therapies, and the usage of medicinal plants and psychotherapy form two of the three stated foundations of the treatment ("Addiction treatment", n.d.). The third foundation, that of community (or cohabitation), is where patients can observe the progress of their treatment in a relational sense.

Community

Patients who complete the entire treatment live in Takiwasi for up to nine months (and occasionally longer). These patients spend a great deal of time with each other, and engage in a wide range of activities and workshops. The processes that unfold during the plant work and psychotherapy are meant to be lived out within the context of the inpatient community:

Isaac: It's like constantly living with a mirror, which is kind of hard. At the same time, living with those same people all the time creates a very strong bond. And that bond is there with the group therapy too. People really tell what is in their guts. Like, they talk about their suicide attempts, the abuse story they have, the shit they did when they were doing drugs. So you know them almost from the deepest part of the soul. You actually receive a lot of support from them also. They're a good influence, that's what I want to say.

The patients rise early for work most mornings, doing a variety of jobs that actually contribute to the upkeep of the centre (so-called *ergotherapy*). For

example, they clean, learn to cook and bake bread (which is eaten by all of the patients), do yard work, feed and care for the Takiwasi pets, and so on. In the afternoons there are usually workshops, some of which are facilitated by long-term staff (e.g., the religion and mask-making workshops), whereas others are dependent on the availability of transient or external staff (e.g., yoga, drawing, music, or martial arts workshops). Sports are also a regular activity, with football (soccer) being the most popular.

While Takiwasi is quite often discussed in the context of ayahuasca-assisted treatment, the community aspect is vital, and in reality the majority of the patients' time is spent in some sort of communal activity. In some cases, it is the most valued aspect:

David: Which part of the treatment do you think has been the most effective for you?

Paul: It's hard to choose, because the truth is that it's very complementary, it's the combination of everything. Early on I might have said the ayahuasca, but if I had to say now, it would be the convivencia. My core problem has been a social phobia, so the therapy and the convivencia has helped me a great deal.

In the final months of treatment, patients enter the *reinsertion* phase (see J. Mabit et al., 1996, p. 27), where lifestyle restrictions are loosened somewhat. Reinsertion involves preparing for a return to society; usually paid work is sought in Tarapoto (even if it is only temporary), and patients are granted a measure of freedom to leave the centre for work or other appointments. It is around this time that patients are permitted Internet access and hence freer communication with the outside world. The length of such restrictions is a common source of irritation:

Daniel: One of the things that people bitch about the most here—but it's one of the best things about Takiwasi—is giving you things at the right time. Like reinsertion, getting Internet access and being able to communicate; you bitch for it seven months long, and then in the seventh month, OK, now you've earned it. Have it. And you tend to appreciate it more.

As outlined earlier, patient life in Takiwasi is regimented. There is a stark contrast between the controlled internal environment and the autonomy that re-emerges upon exit from the treatment. Without long-term follow-up studies, it is difficult to say how well patients make the transition back from the therapeutic community to regular society (a transition which can be stressful; Soye & Broekaert, 2003), although Takiwasi patients close to exit are often highly motivated:

Luke: I think a little privacy will do me good. I need that, although I'll miss the people. Sometimes you feel lonely and you say where are the people, you know? I want to play football, or play some chess, and I won't have them around anymore. But it's time to go out and find new friends, a new social circle. I'm very excited for my university course, I'll dedicate myself fully. My relationship with Takiwasi has been nearly a year, and I changed a lot, I feel it. I'm so anxious to get back to the real world to see what's going to happen.

The most commonly cited long-term data is from an internal Takiwasi study (covering the years 1992–1998) that asserts an improvement in 62% of patients (J. Mabit, 2002).¹² Given the unusual nature of the treatment¹³ and the dearth of independent long-term follow-up studies, understanding the manner in which patients reintegrate after a full term of treatment remains a topic for future research.

5.3 Structural Change

With the major treatment techniques discussed, the final section of this chapter will focus on what is referred to in Takiwasi as “structural change” (J. Mabit, 2002, p. 31). This refers to change at a fundamentally personal level, and the most salient issues emerging in conversation with patients concerned: (a) religiosity (or spirituality), and (b) personality and maturity.

Religion and spirituality

From a religious perspective, Takiwasi is oriented towards Christianity. There is a Catholic priest on site who is available for consultation, and within Takiwasi he also conducts masses and Christian rites. However, while ayahuasca and traditional medicines sessions are infused with Christian symbolism, they remain separated from the practice of the Catholic faith. Attending a Sunday mass in Takiwasi is not unlike any other mainstream Catholic mass, with proceedings adhering to widely accepted church dogma (e.g., ayahuasca does not replace the Eucharist; see Apfell-Marglin, 2007, pp. 39–40). While mass is not a formal part of the treatment and is optional for patients, from time to time some patients make a full conversion and are actually baptized in Takiwasi (a practice which again is not connected with the use of ayahuasca or traditional medicines).

¹²The study excluded data for the 32% of patients who had left the treatment before their first ayahuasca session.

¹³While legally and culturally accepted in Peru, the treatment modality could face regulatory challenges in other countries due to drug scheduling laws, especially concerning the use of plants containing DMT (Blainey, 2015; Labate, 2011; Nutt et al., 2013; Tupper, 2008).

Although the presence of Christianity in Takiwasi is unsurprising given its relationship to *vegetalismo* (Luna, 1984b), the expressed ideal of the centre is to be open to all religions:

What can be observed in Takiwasi is that the persons who had a personal religious path before coming here, “radicalize” themselves, in the good sense of the term, that is go to the root of their own faith: Christians become better Christians; Jews becomes better Jews; Muslims become better Muslims; Buddhists become better Buddhists...

In a first experience, there is no sudden massive conversion. That can happen but these are isolated cases[...]. The majority of persons go through a process of purifying their own faith, their own spiritual path, and experience reconciliation with their own spiritual heritage. (Apfell-Marglin, 2007, pp. 44–45)

This allowance for religious autonomy does exist in Takiwasi, although it is not always so simple for patients without a religious background:

Isaac: If you are Muslim, no one is going to bother you about that. The most important thing to them is that you practice it. If you want to be Muslim here they will totally give you freedom. But if you do nothing, they are going to show you Catholicism.

While Isaac developed an interest in spirituality, he rejected affiliation with any particular religion. During his treatment however, he felt at times that he was pushed towards Christianity, although he remained without formal religion throughout his treatment. On the other hand, Ryan did not feel pressured: “Christianity is not forced. You don’t have to go to the masses, or speak to the Father, but there is a class. But even that teaches you about temptations, things like that. So it’s actually helpful in a way”.

The most common argument made for the acceptance of religion in Takiwasi is a pragmatic one. That is, that faith and the practice of religious rites will have tangible benefits in the spiritual world (e.g, ostensibly becoming apparent in *ayahuasca* sessions; see chapter 4). Ryan, who did not consider himself to be a Christian, spoke about this pragmatic view with regard to *ayahuasca*:

Ryan: If you see bad spirits and all the negative shit without some type of faith, you’re going to lose yourself. It’s going to be horrible, you’re going to be in a dark place. I mean they chose Christianity because it’s here in the country, and why not? I’m not into that religion at all, but I ended up praying to Saint Michael and to the Virgin Mary and, it actually helps you out. When you feel bad energy and you think about that, it actually pushes it out.

This effect of prayer can be explained well enough via psychological mechanisms, but it goes without saying that for Takiwasi, the genuine practice of religion reflects something true about the world (i.e., beyond the psycho-cultural). James shared a similar experience regarding the pragmatic use of religion:

James: In one session I saw a bad spirit outside the maloca. It was a black shade always behind a certain patient, and it was trying to get in and fuck the ceremony up. I really felt an energy flowing towards me from it. Completely negative. And I started to shake, to have chattering teeth, I felt like I was dying—cold like death.

I told the curandero about this evil spirit and he said “you have to pray”. I never prayed once in my life, but I tried to, I was trying everything; and God it did help me. I don’t know if it was from simply changing my focus, or if the praying itself helped, but after 15 minutes it was completely gone, and from there I didn’t feel any effect.

Still, the experience of prayer as a useful resource does not necessarily translate into a religious conversion to Christianity:

James: But I still have quite a big resistance to the religious aspect. I’m convinced now that the spiritual world does exist, but does it have to be linked with religion? I’m not quite sure about that. I’m trying to open myself a bit to it but I don’t feel that I fit in with Christianity; it’s not something I can relate to so much. But I have the feeling that I need to develop spiritually, that’s for sure. I think I could relate to Hinduism or Buddhism much more than one of those monotheistic religions.

Having a religious upbringing is also no guarantee that a patient will find religion to be entirely satisfactory:

David: Were you religious when you first came to Takiwasi?

Luke: I didn’t care at all. If you asked me I would say I’m Catholic, but I didn’t go to church for about seven or eight years. But the plants started to show me things, from my ancestors. I saw both my grandparents, who died when I was very young. Those things moved me, and that’s when this spirituality used to come up on me.

My whole life I saw God as being outside somewhere, in the sky, in Heaven. And the thing that changed is, that I found God inside. In my view, God is an internal vibration—a state of mind that is possible to reach, that communication, with the higher thing. And now instead of asking for things, I switched “please” for “thanks”. And that changed a lot in my life, because I can withstand more. I think being thankful is the thing that helped me a lot, in everything.

For Luke, this renewed perspective on spirituality did not result in a return to Christian religion:

Luke: Modern books are easier for me to understand than the Bible. Also when most religious people talk about the Bible, you can't question it. It's written there and that's it. If there are two books, for example, one talking about meditation and how to tune yourself in with the spiritual side, and another book talking about Jesus or the apostles and the religious way of doing it—I prefer the first one.

There are of course other cases where a deep faith in Christianity (or another religion) develops. Isaac, who believed in God but was not religious, spent over nine months in treatment and noted individualized effects:

David: Do you think patients here start to adopt spiritual beliefs, in general?

Isaac: I saw a lot of sceptical people becoming strong believers. I saw some of them keeping, like, a relative spiritual doubt also. It depends on the person. But I see some going from, "I don't want to be in church, I hate it", to "I need to go to church".

David: Really, in how long?

Isaac: Like, in three months. The treatment is different for everyone. I saw guys that were the same from the beginning to a year on.

David: No change in terms of spirituality?

Isaac: In every way. They were the same guys from the beginning to the end.

Thus religious conversions are possible, but certainly not universal. Yet even when they do occur, experiences within treatment are not necessarily predictable. One South American patient, who had become a devout Christian since entering treatment, described an ayahuasca experience in which he saw Buddhist monks flying in the sky (and see Sieber, 2003, pp. 125–126); however, this Buddhist-themed vision was not perceived as a threat to his Christian faith (and was rather interpreted as support for the validity of other religions). During a separate session, the same patient had felt a direct communication with God and was told that no major religion is superior to any other, and that the most important thing was to be thankful for life. Such experiences are not only highly idiosyncratic but are also outside of Takiwasi's control, thus leaving considerable scope for religious possibility.

Personality transformations and maturation

At this point, it is evident that the Takiwasi treatment has the potential to induce deeply significant experiences for individual patients (events that may be emotionally comparable to the experience of death and rebirth, for example). It is not unexpected then that the theme of personality change was common in my conversations with patients. Although personality is often considered to be a relatively stable attribute in adults (McCrae & Costa, 1994), there is evidence for change across the lifespan (depending on the personality trait and individual; Specht, Egloff, & Schmukle, 2011). Moreover, there are existing reports of personality change in the entheogen and psychedelics literature (e.g., Barbosa et al., 2009; Bouso et al., 2012; Bouso et al., 2015; MacLean et al., 2011).

In connection with the previous section, there are times when a change in personality occurs with a concomitant movement towards religion:

Luke: I see people that changed and now believe in God. For example, John. When he first came, I could feel the energy, it was so negative, very dark. He was one of those guys that wear black and metal and all that. And his eyes were very dark and deep. He never smiled and he was always complaining; you could feel the bad vibes coming from him. Now he is one of the most enthusiastic guys at church. Beforehand he was always swearing to himself and at everyone. Now he changed that, a lot. He still has those moments but he's completely different.

Dramatic changes can also be prompted as part of an unfolding treatment process, which may not be linear. Luke's story actually involved a temporary suspension from treatment:

Isaac: When Luke first came to Takiwasi it was very heavy in the convivencia. He was starting fights all the time, screaming, being angry. Eventually he started to threaten people, so Takiwasi sent him home for three months, and said he could come back after that.

During those three months he relapsed. And when he came back he changed. Totally. He changed so much that it's almost hard to believe. He's another guy, you know, a huge transformation. He's started only one fight since. Before it was every week, two or three times a week, for bullshit.

He told me that before he got kicked out, he was in the treatment without really realizing what he was doing. Then he went back to his life, and he saw all the troubles he had and why he needed Takiwasi. So when he came back, he came back with the right mindset, if I can say that.

Recalling his use of amphetamines and pornography, Luke himself spoke in clear terms about how his life had been prior to, and then during, the Takiwasi treatment:

Luke: I couldn't express myself, I was in a deep depression, and the drug was really a world that I was ashamed of. I was a husband at that time, I'm still a father, and it's hard for a father of three kids to be eight hours masturbating himself on the computer, and then not being able to go to work, and feeling jealous of the other guys that play with their kids because you're not able to.

I really wanted get away from my life, of what I was feeling. That's how I was. When I first came to Takiwasi, I didn't know what I wanted in life, why I was on earth. I didn't know if I liked red or blue or white or black, I didn't know anything. I was just a piece of functioning brain and I couldn't think actually. I was just existing. I didn't have any meaning, and now I do.

I wasn't friendly at all before, I was just a guy that was like, fighting and arguing with everyone. And this consciousness and patience and understanding, it's just something that changed my life I think. One thing that's very special to me is my kids. When I was on drugs they were a problem, as everything in my life was. But I don't see now as I used to.

While not attributing the entirety of his change to ayahuasca, Luke did feel that it was an instrumental catalyst for him:

David: Do you think you changed because of the ayahuasca sessions?

Luke: That's difficult to say. I think I wouldn't be able to do that without ayahuasca. Because it showed me things inside that I didn't know about. I think I could do therapy for ten years and not be aware of the things that one ayahuasca session showed me. You can see things as they are, the raw things as they are. It's difficult to explain because the experience is, intrinsic, it stays in you. It's not intellectual. Like, you couldn't explain it in a paper, because it comes with a feeling! So that is a whole feeling experienced, and you don't have a different attitude because your intellect says so—you feel that the attitude has changed inside. It's something that comes from the heart, not from the mind. It's different.¹⁴

¹⁴Luke's insistence that his experience could not be intellectually understood is reminiscent of William James' (1902/2008b) description of the ineffability of mystical experience: "No one can make clear to another who has never had a certain feeling, in what the quality or worth of it consists. One must have musical ears to know the value of a symphony; one must have been in love one's self to understand a lover's state of mind. Lacking the heart or ear, we cannot interpret the musician or the lover justly, and are even likely to consider him weak-minded or absurd. The mystic finds that most of us accord to his experiences an equally incompetent treatment" (p. 267).

In many ways, these personality changes could be conceptualized as maturation, or the kinds of changes that tend to occur with successful ageing. Given Takiwasi's focus on providing the "initiatory rites" that are missing from contemporary society (J. Mabit, 2007), this would seem to be an implicit goal of the treatment. But the fact remains that the treatment is very difficult to endure, although at the same time, there are elements within it that tend to promote inner strength and resolve:

Mark: I think I'm strong now. I've really had an intense experience with plants, and I'm prepared to do difficult things. For example, I finished the first ayahuasca session on the floor, like, "Please, kill me!". Now I'm prepared pass through bad moments. I know that I will never fully lose the depression in my life, but I'm not going to start taking drugs or going to bed when I feel down.

David: Whereas before it overwhelmed you?

Mark: It's like a tendency in my family. But you have to draw a line. Before I came to Takiwasi, when I got down, I went straight down. Now that's more gradual.

David: And you used to drink when that happened?

Mark: Yeah, drinking or snorting cocaine. I wanted to escape from my reality. I would say now that I was very immature. I lived my life as a kid, like Peter Pan. I didn't like my life, so I created an artificial reality. OK, I went to work, but when I got home I was taking drugs. I wanted to go to nightclubs and parties and take ecstasy all the time, 24 hours. And what was I doing with my life? I never asked myself that.

As suggested by these accounts, over the course of treatment many Takiwasi patients do realize a considerable inner development. Moreover, they feel that they have distanced themselves from their former approach to life and addiction (although it is difficult to predict how they will fare after returning to the wider community). But just as with changes in spirituality, there are cases where no substantive development occurs at all. As mentioned previously, Andrew was one of these patients, despite spending ten months in treatment. Although he recognized change in others (even noting physical alterations), his experience attests to the necessity of matching the treatment with compatible patients:

Andrew: You see Isaac, he came here very skinny, always crying because people are not fair; he was very much a child. But he left the treatment like a man, with a good body. For me I don't see a difference. Physically, I'm the same. People who come here, like Isaac, their face takes on maturity—but I have the same face. I look at my photo from the beginning, and I'm the same.

David: And you feel the same?

Andrew: Yeah. I feel a little better, but not too much. For me the treatment is not some, “Wow, big thing”.

5.4 Conclusion

In this chapter the treatment and its effects were examined largely from an inpatient perspective. While certainly not covering the entire spectrum of patient experience, the techniques discussed thus far do constitute the bulk of the treatment (as practised between 2014–2015). Moreover, these techniques were the ones most frequently mentioned by patients, and were therefore likely to be the most salient to them.

The use of ayahuasca was seen to be integral, with James noting for example that it “structures the treatment”. However, it has been demonstrated that Takiwasi is much more than an ayahuasca-assisted treatment for addiction. As Paul put it: “We all have to get up in the morning with a lot of strength and fight every day. It’s not easy, and the healing is not magic. It’s not a session of ayahuasca and then you’re cured. No, this doesn’t exist”. In one sense, the Takiwasi programme demonstrates a broad application of traditional Amazonian medicine in a way that is not ayahuasca-reductive (e.g., with many patients finding the dietas to be particularly beneficial). On the other hand, the adoption of a traditional epistemology and worldview (i.e., where experiences with plants and dreams can inform us about the world) means that the treatment evolves internally over time, with some ritual forms being wholly idiosyncratic to the centre.

Amongst all the diversity of experience, it is clear that patients often (but not always) find something compelling in the treatment. Yet any effort to distil the treatment down to its “essential elements” would seem to be misguided (e.g., by focusing on psychoactive chemical compounds, or the decontextualized use of ayahuasca, dietas, etc.). The effects of the treatment are bound up in the interplay between myriad factors that are biological, psychological and behavioural, cultural, social and historical—and according to the view of Takiwasi curanderos—spiritual.

As the methodological focus of this chapter has remained at the ethnographic and interpersonal levels, the task of presenting a biopsychosocial account of the treatment remains incomplete. To remedy this, the next two chapters will examine within-treatment effects from the psychological and biological frames of reference, respectively.

Psychological Changes Within Treatment

Synopsis In the preceding chapter it was seen that Takiwasi patients often perceive benefits while in treatment, and in some cases appear to undergo major changes. This chapter supplements those claims by reporting on the quantitative psychological study of patients in treatment. It covers the background theory and rationale, study design, instruments and methods used, statistical results, and discussion on the importance and meaning of those results. Psychological stress is evaluated and measured in accordance with the theory of addiction outlined in chapter 2, although it is also embedded in a broader measurement process that aims at capturing the generalized effects of the treatment.

In the larger context of the study, the quantitative measurement of psychological factors was intended to add some measure of objectivity towards understanding how patients respond to treatment in Takiwasi. As psychological study participants answer test items largely without intervention or interpretation by the researcher, there is less opportunity for researcher biases to enter into analysis (e.g., when compared with general field observations). Of course, this requires the application of reductive methods, and the quantitative instruments employed herein naturally constrained respondents to a prefabricated set of possibilities. Ideally, the results of such a measurement process would be positioned and interpreted within the actual context in which the measurements were made (in this case, chapters 4–5). In other words, it is not enough to make quantitative psychological measurements of individuals and take them to be definitive statements about the experiences of those individuals. The reductive process immediately makes this impossible, since it rules out a full range of expression for participants. Instead, the results of psychological testing should function as suggestions (or indicators) that increase or decrease confidence in particular hypotheses about psychological states. Put another way, even though the operationally defined constructs of psychological tests may correlate with any number of useful outcomes, those same constructs should not be mistaken to equate with the things that they purport to measure. That is the sense in which

the psychological testing in this chapter is intended to be received.

Given that psychological tests function only as proxies for their object of measurement, is it worth noting that those proxies normally contain a significant amount of error (Traub, 1997). Amongst the various sources of error, the idea when applied to Takiwasi is to draw out trends of change within the data (or in engineering terms, to find the “signal” amongst the “noise”). Of course, such trends are very unlikely to be found if psychological changes do not in fact take place for Takiwasi patients. However, if statistically significant and clinically meaningful trends can be extracted from the mass of superfluous variation, then the reductive psychological tool will have yielded fruits. Prior to this analysis however, it is necessary to select constructs that are worth measuring.

Relevant psychological constructs

The task of measuring addiction would be greatly simplified if it were able to be condensed into one construct, such as craving. However, as outlined in chapter 2 (and especially in the work of Bruce Alexander; 2000, 2008), addiction is always an adaptive response to the conditions of life. Whether or not an overwhelming and detrimental involvement with some activity manifests will depend on the mental, sociocultural, and existential (or spiritual) resources that an individual is able to draw upon. This reality is more or less reflected in the two most popular tools used for addiction assessment: The Addiction Severity Index (ASI; McLellan et al., 2006) and the Global Appraisal of Individual Needs family of instruments (specifically the GAIN-I and GAIN-M90; Dennis, White, Titus, & Unsicker, 2008). However, in both cases, the assessments are heavily focused towards substance abuse and those life domains that are likely to be affected (such as legal issues, vocational status, and risk behaviours). The repeated application of these instruments is probably better suited to outcomes evaluation where patients are living in the community. Therefore the measurement of the treatment process itself requires an array of carefully selected constructs.

The Takiwasi residential treatment, while most often applied to drug addiction, is in fact general enough to be utilized for a range of mental health issues. One of the most interesting aspects of the treatment is that many of the fundamental techniques are not specific to addictions at all. The ceremonial use of ayahuasca, for example, has been suggested to have resolved a range of psychological ailments (see chapter 3, and to some extent chapter 5). At the same time, Takiwasi’s treatment programme is highly novel and is close to unheard of in the English-language scientific literature. Therefore the quantitative measurement of psychological change within Takiwasi must fulfil dual requirements: It should measure constructs that are not only relevant to addiction, but are also able to capture the generalized effects of the treatment.

Three psychological areas that are clearly linked to drug addiction are mental illness, stress, and neuropsychological performance. The prevalence of comorbid mental illness amongst the substance abuse population is much higher than the

base rate (Grant et al., 2004; Harris & Edlund, 2005), thus the ability to deal with various forms of psychopathology appears to be mandatory in addiction treatment. Stress not only forms the basis of the biopsychosocial addiction model outlined in chapter 2, but is also linked with psychopathology, particularly in the interpretative phase (i.e., through dysfunctional attitudes; Martin, Kazarian, & Breiter, 1995). Finally, neuropsychological deficits have been reported as a result of the long-term abuse of cocaine, opiates, amphetamines, cannabis, and alcohol (Baldacchino, Balfour, Passetti, Humphris, & Matthews, 2012; Crean, Crane, & Mason, 2011; Fernández-Serrano, Pérez-García, & Verdejo-García, 2011; Jovanovski, Erb, & Zakzanis, 2005; Scott et al., 2007). In the case of Takiwasi, there is an interest in the possibility of neuropsychological improvement (perhaps associated with ayahuasca use, e.g., Bouso et al., 2012; cf. Doering-Silveira, Lopez, et al., 2005), yet also deterioration, since the majority of Takiwasi's treatment techniques are scientifically unstudied.

Two further constructs that are less general (either being more applicable directly to addiction, or to the Takiwasi setting) are craving and spirituality. Craving is obviously essential, having a place in nearly all psychological theories of addiction over a 60-year span (Skinner & Aubin, 2010). On the other hand, religiosity and spirituality are not usually explicit components of addiction theories, yet they often play a role in treatment (Humphreys & Gifford, 2006; W. R. Miller & Kurtz, 1994). Aside from Miller's (1998) suggestion that addiction researchers should increase their focus in the area, spirituality remains a vital construct in the Takiwasi context. It is not only deeply connected with sacred plant usage (Albaugh & Anderson, 1974; Dobkin de Rios & Smith, 1977; Kjellgren et al., 2009; Pascarosa et al., 1976; Winkelman, 2005), but is central to the Takiwasi conception of addiction aetiology (see chapter 4).

The final area of psychological interest is the self-perception of physical health. While perceived physical health has been found to be negatively correlated with drug addiction severity (Richter, Eikermann, & Berger, 2004), the associations are not uniform across substances (Ryan & White, 1996). Regardless, the motivation for measuring Takiwasi patients' health perceptions is similar to the neuropsychological rationale: The treatment itself is under-researched, and therefore the measurement of changes in health perception constitutes an important vector for estimating the treatment's broader effects.

6.1 Method

Design

The study was based on naturalistic observation of repeated-measures performance on a battery of psychological tests, with the aim of estimating within-treatment patient change. In the language of Campbell and Stanley (1963), where X represents some experimental manipulation and O_x represents an observation

or measurement point, the design was closest to a quasi-experimental time-series:

$$O_1 \ O_2 \ X \ O_3 \ O_4$$

which includes multiple measurements both prior to and after a unique manipulation in order to increase confidence, in the absence of a control group, that the manipulation was likely to have caused an observed change (and not for example some previously unmeasured historical factor). However, the impossibility of measuring patients more than once prior to treatment, combined with the length of the treatment, led to the following design:

$$O_1 \ X \ O_2 \ X \ O_3 \ X \ O_4 \ X \ O_5$$

which features: (a) only one measurement prior to manipulation, (b) the presence of ongoing manipulation (i.e., the exposure to Takiwasi's treatment programme, X , does not stop occurring), and (c) lack of control group; all of which combine to engender validity weaknesses associated with an experimental one-group pre-test post-test (i.e., $O_1 \ X \ O_2$) and the above mentioned quasi-experimental time-series (Campbell & Stanley, 1963). Such a design in isolation is quite weak, and contains many threats to internal and external validity. For instance, a patient who was already improving before entering Takiwasi (i.e., on an upward psychological trajectory) might have their continuing improvement on scores attributed to Takiwasi's intervention when the change would in reality have occurred regardless (since history had not been measured). In general, the difficulty is that change might be occurring for reasons other than the treatment itself (e.g., the mere passage of time).

While a control group would have been ideal, for example containing patients undergoing similar length residential treatment with a more well-known programme, it was not possible to obtain. In the absence of control, an objective observer who is completely naive regarding psychedelics might have little certainty that the Takiwasi intervention does anything above and beyond that which is provided by all therapeutic communities. Indeed, observed changes may in theory be due to any number of factors which are not part of the putative drivers of change unique to Takiwasi (e.g., the simple withdrawal of access to objects of addiction, or a patient's temporary removal and refuge from a troublesome social environment).

However, the advantage of the Takiwasi programme is that there is little question of whether the therapeutic intervention has an effect. The most obvious example, which I experienced firsthand, is that Takiwasi provides patients with controlled and ritualized access to powerful psychoactive substances over a lengthy period of time, and for this reason alone I expected that change would be found (although the direction of change is a critical point of interest). It is not completely surprising that apparently long-term personality changes have been experimentally induced through singular high-dose exposure to psilocybin (MacLean et al., 2011), and to hold doubt over whether there is a treatment

effect in the majority of cases at Takiwasi (either positive or negative) would be misplaced scepticism.

Similarly, from a sceptical scientific point of view, one might suppose that the long-term administration of relatively unknown psychoactive plant preparations could be harmful, possibly leading to organic brain damage or mental illness. Yet as demonstrated in chapter 3, there is a base of literature suggesting that certain psychedelic substances and traditional medicines, when administered under favourable conditions, can be therapeutically useful. In general, these competing hypotheses (i.e., of either negative or positive change) should produce opposing results over time on an appropriate psychological test battery. That is, it would be highly unlikely to observe a trend of increasing well-being and mental health scores while psychosis and brain damage were being manifested, and vice versa one would not expect to see generally decreasing mental health scores in the presence of positive therapeutic change. Clearly this testing is only possible in a broad sense as the treatment *X* represents the entirety of Takiwasi's intervention; however, just one technique carrying serious adverse effects should lead to data in opposition of a "positive change" hypothesis.

In sum, while the design employed does not allow for causality to be attributed to specific aspects of the treatment (or even the treatment itself in the absence of control), significant results for change on the entire battery of tests would still work in a negative way against hypotheses that predict opposing data. In other words, the design in isolation allows for reducing confidence in hypotheses that do not fit the data, but not for making inferences about what might have caused the actual data. For this reason, the psychological results in this chapter are intended to triangulate with anthropological and biological data (Jick, 1979).

Participants

Psychological test data was obtained for 38 patients, but I later excluded from analysis one patient who did not have an addiction problem, and one patient who had returned for re-treatment after relapse (who did not sensibly fit into the study measurement system). Therefore the main study sample consisted of 36 male Takiwasi inpatients with ages on treatment admission ranging from 20–50 years ($M = 29$, $SD = 7$), and total time in treatment (from entry to exit) ranging from 3–367 days ($Mdn = 200$). There was also a subset of the main sample which only included patients with two sets of complete scores on a neuropsychological test battery. This subset consisted of male Takiwasi inpatients ($n = 8$) with ages on treatment admission ranging from 21–50 years ($M = 34$, $SD = 9$), and total time in treatment (from entry to exit) ranging from 111–305 days ($Mdn = 274$).

Nearly all patients in the study were being treated for drug addiction, except for one patient who had a history of alcoholism, yet was seeking treatment exclusively for compulsive gambling. Although additional problems such as addictions to online gambling or pornography were present for certain patients, in most cases treatment was being sought primarily for compulsive drug abuse.

In Table 6.1 demographics and descriptive statistics for both the study samples (main and neuropsychological) are contrasted against scores computed from Takiwasi's historical inpatient records (where available). The demographics of both study groups are reasonably consistent with Takiwasi's records, although there may be a more recent increase in: (a) patients from outside of Peru, (b) the number of patients completing the full treatment, and (c) non-religious patients (with a concomitant reduction in Christian patients). Drug use statistics (calculated from ASI records) are comparable with those reported by Horák (2013, pp. 22–23), with alcohol, cannabis, and cocaine (including derivatives) being the most frequently used.

Measures

The psychometric measures used in the study can be broken up into three logical groupings: (a) addiction severity, (b) main test battery, and (c) neuropsychological status. Details of the instruments used in the groupings are presented below.

Addiction severity

Semi-structured interviews using the fifth edition (US Spanish) of the ASI (McLellan et al., 2006) have been conducted on intake with all Takiwasi inpatients since 2009. An important part of scoring the ASI interview is the attempt to quantify the patient's addiction severity via objective standardized measures (*composite scores*) for each of seven life problem areas: Medical, Employment, Alcohol, Drug, Legal, Family, and Psychiatric. While the interview questions sometimes focus on life history, those items that make up the composite scores concern only the last 30 days or the present. Higher values represent greater problem severity for all composite scores.

Despite the fact that the ASI has psychometric deficiencies (Mäkelä, 2004; McLellan, 2004; Melberg, 2004), it has seen very wide usage and offers a practical option for quantifying addiction severity across multiple problem domains and across treatment centres. Good results for composite score internal consistency, test-retest reliability, and inter-rater reliability have been reported (Alterman, Brown, Zaballero, & McKay, 1994; McLellan et al., 2006; McLellan et al., 1985). Although most psychometric validation has concerned the English version, Butler, Redondo, Fernandez, and Villapiano (2009) examined the psychometric properties of a multimedia Spanish ASI adaptation and found good convergence with the English version.

Within the context of the present study, the ASI scores function as descriptive of patients on intake only, as there are no follow-up testing procedures in place at Takiwasi (and time and resources did not permit the pursuit of follow-up data). Due to the complexity of the instrument, I conducted ASI coding training with the Treatment Research Institute¹ prior to the study.

¹<http://www.tresearch.org/>

Table 6.1
Patient demographics

	Main sample %	Neuro subsample %	Takiwasi records %
Drug use 30 days prior to treatment			
Alcohol	83	75	73
Cannabis	71	75	58
Cocaine & derivatives	51	63	43
Sedatives	26	25	24
Opiates	23	—	20
Amphetamines	20	25	11
Barbiturates	13	—	6
Hallucinogens	9	—	9
Poly-drug use	66	75	49
Country of residence			
Peru	33	38	66
Rest of South America	25	38	10
France	17	12	9
Rest of Europe	11	12	7
North/Central America	14	—	4
Asia	—	—	1
Uncoded	—	—	3
Exit status			
Completed	61	75	30
Voluntary exit	22	—	42
Suspended	14	25	1
Abandoned	3	—	12
Financial difficulty	—	—	2
Uncoded	—	—	12
Death	—	—	—
Age (on admission)			
<20	—	—	11
20–29	58	38	37
30–39	31	25	32
40–49	8	25	16
>49	3	12	4
Total time in treatment (on exit)			
<1 month	17	—	25
1–3 months	11	—	20
4–6 months	17	25	16
7–9 months	17	25	17
>9 months	39	50	21
Religion			
None	50	38	37
Christianity	39	62	55
Buddhism	6	—	2
Islam	3	—	<1
Other	3	—	6

Note. Due to minor rounding errors, some sections do not sum precisely to 100%.

Main test battery

The aim in selecting measures for the main test battery was to assess known correlates of addiction whilst maintaining a low participant testing burden. Patients completed five tests in total, all of which were paper-based and self-report:

Perceived Stress Scale (PSS; S. Cohen & Williamson, 1988): The original instrument is a 14-item scale intended to measure perceived life stress (PSS-14; S. Cohen, Kamarck, & Mermelstein, 1983). It produces a global index of stress with reference to the last 30 days, where higher scores reflect higher perceived stress. The items refer only to generic events (e.g., “personal problems”) and associated emotional states, and the frequency with which the participant has maintained control or the ability to cope. There is a particular focus on uncontrollable stress, which is useful in light of animal studies on stress and addiction that highlight uncontrollable stress as one of the most potent forms of hastening the acquisition of addictions and also inducing relapse (see chapter 2). The generic nature of the measure also makes it applicable within a residential treatment setting where questions that refer to normal community life can be rendered inappropriate or meaningless. Higher than average PSS-14 scores have been demonstrated for cocaine-dependent inpatients when compared with healthy controls (H. C. Fox, Jackson, & Sinha, 2009).

Although the full PSS-14 was administered to patients, during analysis I extracted scores for the 10-item version (PSS-10) due to the improved factor structure and internal reliability of the shorter form (S. Cohen & Williamson, 1988), although both forms are considered to be reliable and valid (Roberti, Harrington, & Storch, 2006). As a global measure of stress, the PSS-10 measures two underlying factors (helplessness and coping; Hewitt, Flett, & Mosher, 1992; Lavoie & Douglas, 2012; Martin et al., 1995; Roberti et al., 2006); however, the distinction is probably not analytically important when measuring perceived stress (S. Cohen & Williamson, 1988).

The particular version used was the European Spanish translation developed by Remor (2006), who reported test-retest reliability of .77 and an internal consistency alpha of .82 in a sample of 440 Spanish adults. Remor (2006) has also demonstrated concurrent validity of the translation with the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983).

Spiritual Well-Being Scale (SWBS; Ellison, 1983): The SWBS is a 20-item scale that was developed to measure subjective well-being by way of the intangible or spiritual aspects of life. The instrument consists of two dimensions (10 items each) which divide global spiritual well-being (SWB) into: (a) religious well-being (RWB), and (b) existential well-being (EWB); where higher scores reflect higher well-being for both dimensions. RWB items concern the participant’s relationship with God (as the participant understands the word), whereas EWB items are secular and probe life satisfaction, meaning, and purpose. While it is clearly important to employ a measure of religious spirituality within the context of

Takiwasi, the EWB allows for the measurement of well-being changes in those patients who are not religious (or are explicitly irreligious). EWB can also function as an acceptably non-specific quality of life measure, as there are no questions regarding satisfaction with transport, working life, time spent with family and friends, or other items that become irrelevant within a therapeutic community. In fact, the authors of the test explicitly state that the SWBS will be most useful in situations where well-being is significantly impaired (e.g., in a clinical setting; Bufford, Paloutzian, & Ellison, 1991).

Test-retest reliabilities for the SWBS have ranged from .73 to above .85, with alpha values above .84 (Bufford et al., 1991). Concurrent validity has also been demonstrated as the SWBS is positively correlated with measures of health and emotional well-being, as well as being negatively correlated with measures of life dissatisfaction and poor health (Bufford et al., 1991; Paloutzian, Bufford, & Wildman, 2012). The factor structure of the SWBS remains contentious however, with a number of studies failing to replicate the original two-factor solution (Utsey, Lee, Bolden, & Lanier, 2005). Murray, Johnson, Gow, and Deary (2015) provide evidence to suggest that the confusion surrounding the SWBS factor structure may in fact be due to methodological nuisance variables (i.e., indicating that the additional factors are not substantive), and apart from outlining directions for psychometric improvement, Murray et al. (2015) recommend adherence to the original two-factor structure as an appropriate option.

Unfortunately, psychometric validation of the Spanish version has been limited, although in a preliminary attempt Bruce (1997) reported internal consistencies between .83 and .91, test-retest reliability of .70, and a correlation with the English version of .92 (in a bilingual sample).

Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983): The BSI is an abbreviated (53-item) form of the well-known Symptom Checklist-90-Revised (SCL-90-R; Derogatis & Unger, 2010). It is intended to assist in the diagnosis of psychopathology as expressed through nine primary symptom dimensions and three global indices of distress, which are the same dimensions and indices found in the longer SCL-90-R. The nine primary symptom dimensions are:

- Somatization: Physical symptoms potentially arising from psychological distress.
- Obsessive-Compulsive: The experience of unwanted yet intrusive thoughts or behaviours that carry a compulsive force.
- Interpersonal Sensitivity: Feelings of inferiority, self-doubt, or a sense of inadequacy during social interaction with others.
- Depression: Symptoms associated with clinical depression, including an absence of interest in life, lack of energy, and feelings of hopelessness, unease, and dissatisfaction.

- Anxiety: Symptoms of anxiety including nervousness, agitation, as well as panic attacks and terror.
- Hostility: Manifestations of hostility through thoughts, feelings, or behaviours (e.g., uncontrollable rage or the desire to use violence).
- Phobic Anxiety: Anxieties usually associated with agoraphobia, such as unreasonable fears of public places, crowds, or travel.
- Paranoid Ideation: Paranoid modes of thinking that include suspiciousness, delusions, and grandiosity.
- Psychoticism: Symptoms range from withdrawal and social isolation through to psychosis (e.g., believing that one's thoughts are being controlled).

The Global Severity Index (GSI) is the most important global measure and it captures information about the intensity and frequency of the symptoms endorsed for all dimensions (plus a few items that cross-load and form no particular dimension at all). Higher scores reflect greater problem severity. The Positive Symptom Total (PST) is a count of the total number of symptoms endorsed by the participant, whereas the Positive Symptom Distress Index (PSDI) adjusts the PST for symptom severity, and is intended as a measure of patient response style. Higher scores indicate a response style that amplifies distress levels, whereas lower scores are indicative of a minimizing style (Derogatis & Melisaratos, 1983).

Derogatis and Melisaratos (1983) have reported test-retest reliabilities ranging from .68 (Somatization) to .91 (Phobic Anxiety), with .90 for the GSI. Correlations between BSI and SCL-90-R symptom dimensions were also very high, ranging from a minimum of .92 (Psychoticism) to a maximum of .99 (Hostility). Internal consistencies for the symptom dimensions are very good, ranging from .71 (Psychoticism) to .85 (Depression). However, research into the factor structure of the SCL-90-R and the BSI has been unclear, with different structures emerging across populations and analytic techniques (Ruipérez, Ibáñez, Lorente, Moro, & Ortet, 2001). For example, although Boulet and Boss (1991) reported excellent BSI reliability and internal consistency within a clinical sample, the factor structure indicated a unidimensional scale. Factorial analysis of the Spanish BSI in a non-clinical sample resulted in only six factors (Ruipérez et al., 2001). Overall, it seems that some caution is warranted when interpreting the BSI in terms of the symptom dimensions, although the instrument certainly has validity as a global measure of psychological distress.

The BSI solicits information about the patient's previous seven days only, making it the only test from the main battery where the question period is not the previous month. Finally, there were two items from the Phobic Anxiety dimension that were irrelevant within the context of Takiwasi inpatient life, although the effect on the global indices would have been a minor under-reporting at worst.

Short Form Health Survey 36 Version 2 (SF-36v2; Ware, 2000): The SF-36v2 is a multidimensional 36-item instrument that measures perceived physical and mental well-being, and can also be considered as a quality of life instrument. As the survey is an update of the original SF-36 (Ware, 2000), the same eight health domains are measured:

- Physical Functioning: The existence and severity of physical limitations.
- Role-Physical: The extent to which physical problems have caused difficulties with work or usual activities.
- Bodily Pain: Intensity of bodily pain and level of interference with work or normal activities.
- General Health: Current perceptions of general health status, as well as expectations regarding future health.
- Vitality: Levels of energy in terms vitality and vigour versus fatigue and listlessness.
- Social Functioning: The impact of problems (physical or emotional) on social activities.
- Role-Emotional: The impact of emotional problems on work or other usual activities.
- Mental Health: General mental health reflecting depression and anxiety versus happiness and well-being.
- Reported Health Transition (RHT): Not contributing to any scale, the RHT functions as a single item measuring perceived changes in health over the last year.

The eight health domains (excluding RHT) aggregate into two global measures which represent the factor structure of the SF36-v2: (a) Physical Component Summary (PCS; physical health), and (b) Mental Component Summary (MCS; mental health). Both PCS and MCS are in fact determined by all eight health domains; however, each domain is weighted towards a particular summary measure (e.g., Physical Functioning influences PCS more so than MCS). Scoring was completed using the QualityMetric Health Outcomes Scoring Software 4.5.1, which reports PCS and MCS values as T-scores (i.e., standard scores with mean of 50 and standard deviation of 10) based on the US population, where higher scores reflect better perceived physical and mental health.

The SF36-v2 Peruvian Spanish translation was used, with a questioning period of the “last four weeks”. The survey items are largely sensible within the Takiwasi context, with the exception of the Social Functioning scale which should be treated with some caution due to references to “family”, “relatives”, and

“neighbours” (most of which are generally unavailable to Takiwasi inpatients). The Social Functioning scale is weighted towards MCS, although it is the smallest subscale, being made up of only two items.

The manual for the SF-36v2 (Maruish, 2011) contains an extensive review of the reliability and validity of the measure. For the 2009 US general population sample, internal consistencies for PCS and MCS were .96 and .93 respectively, while test-retest reliability values were .88 and .79 respectively (with an average 15-week interval). As a very well-established psychological health scale, the SF36-v2 is considered to be a valid instrument (Ware, 2000), and a number of tests (for various translations) of the SF-36 and SF36-v2 in drug treatment settings have reported validity (Daepfen, Krieg, Burnand, & Yersin, 1998; McPherson & Martin, 2013; Richter et al., 2004; Zhou et al., 2013). Furthermore, the equivalence of the factor structure and summary health scores for the SF-36 has been demonstrated across 10 different countries, showing impressive cross-cultural applicability (Ware, Gandek, et al., 1998; Ware, Kosinski, et al., 1998).

Craving Experience Questionnaire-Frequency (CEQ-F; May et al., 2014): The CEQ-F is a generic measure of consumptive craving over a freely specified time period (in this case, the previous 30 days). It is based upon the theory of elaborated intrusion (Kavanagh, Andrade, & May, 2005), which posits that craving begins with an intrusive thought which is subsequently elaborated via multi-sensory pathways. The initial pleasure of the elaboration becomes aversive over time with growing salience of the physiological deficits. According to May et al. (2014) three factors consistently emerge from analysis, which appear to be invariant across substances and time-frames:

- Intensity: Frequency of affective craving (e.g., experiences of desire or need).
- Imagery: Frequency of craving imagery (e.g., imagining the sensation).
- Intrusiveness: Frequency of intrusive craving (e.g., difficulty in thinking about anything else but consumption).

The global CEQ-F score is a summation of the three subscale scores and represents the frequency of craving (as viewed under elaborated intrusion theory). Higher scores show more frequent craving over the past 30 days. Unfortunately, as a relatively recent instrument there is a lack of detailed psychometric validation. However, the test has a strong theoretical underpinning and obvious face validity, while May et al. (2014) have reported evidence for convergent validity with other measures of craving. At present there are no published studies on test-retest reliability (and this may be difficult to achieve as craving can be an unstable state).

Since there was no publicly available Spanish CEQ-F, the English version was manually translated by a multilingual researcher at Takiwasi. I compared the back-translated items (i.e., items from the version that had been translated from English to Spanish, and then back to English again) with the original CEQ-F English items and found no differences in meaning. The finalized items can be found in appendix section A.2.

Neuropsychological status

The Repeatable Battery for the Assessment of Neuropsychological Status Update (RBANS; Randolph, 2012) was introduced in its original form (Randolph, Tierney, Mohr, & Chase, 1998) with the dual purpose of detecting abnormal cognitive decline in older adults and also the neuropsychological screening of younger patients. The update version added the possibility of testing adolescents and also extended support for the use of alternate forms, which allow for repeated-measures testing and therefore the assisted tracking of neuropsychological recovery (or decline) during treatment. The test takes around 20 to 30 minutes to administer and consists of 12 subtests that ultimately measure five neuropsychological indices:

- Immediate Memory: Measures the learning of simple and complex verbal information. Low scores indicate problems with verbal learning, or severe language deficits.
- Visuospatial/Constructional: Measures basic visuospatial perception and the ability to construct an accurate copy of a model. Low scores indicate problems with the processing of visuospatial information (although serious visual impairments could lead to the same outcome).
- Language: Measures expressive language functioning. Low scores indicate problems with the fluent use of language.
- Attention: Measures basic attentional processes and information processing speed. Low scores indicate general attention problems or severe deficits in language, auditory processing, or visual functioning.
- Delayed Memory: Measures delayed recall and recognition for verbal and visual information. Low scores suggest problems with long-term memory.

The Total Scale index is a composite of all indices, where low scores are suggestive of general cognitive impairment. According to the RBANS manual (Randolph, 2012), index reliabilities range from .75 (Visuospatial) to .88 (Immediate Memory) with .93 for Total Scale. Similar results have been found for the Spanish RBANS (de la Torre, Perez, Ramallo, Randolph, & González-Villegas, 2015). While the English RBANS has four equivalent forms (A, B, C, and D), the Spanish version has only two (A and B), which allowed for two testing points only. Index scores for the RBANS are converted from raw scores to standard scores (i.e., with mean of 100 and standard deviation of 15), with the participant's age being used to determine the appropriate conversion bracket.

The RBANS is applicable in an addiction treatment centre due to the low required reading level, the relative brevity of the test (in terms of neuropsychological test suites), and the ability to quickly measure a number of neurocognitive domains (as potential deficits may differ across patients and drugs of abuse).

Positive changes in RBANS Total Scale, Attention, and memory indices after addiction treatment have been reported by Schrimsher and Parker (2008), and a review of neurocognitive deficits resulting from cocaine abuse showed that attention and memory processes are likely affected (Jovanovski et al., 2005). An examination of past 30 days drug use for Takiwasi inpatients (see Table 6.1) shows that cocaine use is fairly common, and is second only to alcohol and cannabis.

In a treatment setting it is also important to employ a measure of patient effort over and above that of observation, as it would be highly undesirable to have concealed patient apathy interpreted as evidence of cognitive impairment. The RBANS Effort Index (EI) developed by Silverberg, Wertheimer, and Fichtenberg (2007) is suitable for this purpose. The EI method tests for cutoff scores on specific subtests that are, in the absence of severe damage, likely to be associated with malingering or insufficient effort. Silverberg et al. (2007) found that between 86%–96% of participants deliberately withholding effort were identified by testing for an EI score of ≥ 1 .

Score meaning reference Included for quick reference is a listing of scales and their scoring direction:

- Positive scales (where higher scores reflect desirable attributes): (a) SWB, EWB, RWB;² (b) PCS, MCS; (c) RBANS indices.
- Negative scales (where higher scores reflect undesirable attributes): (a) ASI dimensions (Medical, Employment, Alcohol, Drug, Legal, Family, and Psychiatric); (b) BSI global indices (GSI, PST, PSDI) and all subscales; (c) PSS-10; (d) CEQ-F.

Sampling

Status as a Takiwasi addiction inpatient was required for study eligibility. Participants were accepted not only on intake, but at any point in their treatment as a result of the analytical possibilities offered by mixed-effects models (e.g., over traditional approaches such as repeated-measures analysis of variance; Gueorguieva & Krystal, 2000). There were no special exclusion criteria apart from the rejection of patients without an addiction problem ($n = 1$), although only fluent Spanish speakers were accepted for neuropsychological testing, due to the nature of the test.

For recruitment, I approached new patients personally and introduced myself and the study, and all patients gave informed consent prior to joining. The rate of participation was 100%, with only two patients initially declining to participate, yet later deciding to take part. Takiwasi staff did not exert any pressure on patients

²While I categorized RWB as a positive scale for simplicity, its perceived value is heavily dependent on societal and individual dispositions towards religion, and should probably be considered as a neutral scale.

to participate in the study, and all patients were informed that: (a) the study was separate from Takiwasi, (b) that their results were confidential, and (c) that participation (or withdrawal from participation) would not affect their treatment in any way.

Given that sample sizes were always going to be small with only 10 months of data collection for a nine-month treatment programme, I expected that medium to large effects sizes would be required to uncover statistically significant effects. Of course, the literature on ayahuasca alone suggested that such effect sizes might be found (see chapter 3).

Procedure

Administering psychological tests on an ongoing basis to addiction inpatients requires a certain measure of interpersonal sensitivity. If the researcher does not build rapport and fails to establish trust with patients (or if the researcher's presence is generally burdensome), it is unlikely that patients will be fully honest when taking tests, nor will they be likely to put forth their best effort on those testing days when motivation is low. I bore this in mind during my fieldwork and the data collection process.

Timing overview

The timings for testing were not bound by precision to the number of days elapsed in treatment, but rather to logical within-treatment *milestones* (i.e., intake, post-dietas, and exit). In the study design:

$$O_1 \ X \ O_2 \ X \ O_3 \ X \ O_4 \ X \ O_5$$

where X is ongoing treatment, each observation point (O_x) occurred according to the following schedule:

- O_1 : Intake. The patient had just arrived at Takiwasi and was being housed in the isolation area. The ASI was administered either by a fellow researcher or a Takiwasi psychologist, and during a separate session I administered the main test battery and, if appropriate, the RBANS (Form A). The mean number of days in treatment at this milestone was 3 ($SD = 3$).
- O_2 : Approximately 30 days had passed since the patient's first dieta, and I administered the main test battery for the second time. By this time, the patient was living in the main housing area with the rest of the patients, had completed a number of purges, and had also begun taking part in ayahuasca sessions. This point usually occurred around three to four months into treatment. The mean number of days in treatment at this milestone was 110 ($SD = 31$).

- O_3 : Approximately 30 days had passed since the patient's second dieta, and I administered the main test battery for the third time. This point usually occurred around five to six months into treatment. The mean number of days in treatment at this milestone was 169 ($SD = 31$).
- O_4 : Approximately 30 days had passed since the patient's third dieta, and I administered the main test battery for the fourth time. This point usually occurred around eight months into treatment. The mean and standard deviation of days in treatment at this milestone was 245 ($SD = 30$).
- O_5 : Approximately 30 days had passed since the patient's fourth (and often final) dieta, and I administered the main test battery for the fifth time. This point usually occurred around nine to ten months into treatment, and was the exit point for many patients. If the RBANS was administered on intake, I administered the alternate form (Form B). Although the RBANS Form B administration should ideally have occurred at this point, some tests were given mid-way during the treatment, as I was leaving the field could not administer the tests at a later date. The mean number of days in treatment at this milestone was 309 ($SD = 27$).

The selection of these observation points was based on the Takiwasi concept of dietas functioning as within-treatment milestones. The post-dieta time period (which lasts for two weeks) is also a time of reflection with minimal plant intake and reduced therapeutic activity in general. Thus the post-dieta provides a natural measurement point as the likelihood of influence by the short-term effects of ayahuasca sessions (or other interventions) is reduced. The choice of measuring 30 days after the dietas was determined by the 30 day questioning period used on most instruments in the main test battery. The day on which testing actually occurred was not usually precisely 30 days after each dieta, but was a close approximation as the choice of day was somewhat constrained by Takiwasi scheduling (and the occasional unpredictability of events in the centre). Tests were nearly always administered in the morning or afternoon, and very rarely in the evening or at night.

ASI

ASI interviews were administered either by visiting researchers or Takiwasi staff, and I calculated composite scores from their records. Since the ASI expects American dollars on all monetary questions (e.g., "How much money did you spend in the last 30 days on alcohol?"), and since Takiwasi accepts patients internationally where currency values can vary widely, I applied an adjustment to convert any non-American currency values into international dollars using purchasing power parity figures (Officer, 1976) from the World Bank (World Bank, 2011). This technique is more precise than performing a currency conversion or entering

values directly, although in practice the effect on composite scores was often minimal. Detailed information can be found in appendix section A.1.

Main test battery

Testing took place in a quiet room with the participant and myself. The order of test administration was: PSS-14, SWBS, BSI, SF-36v2, CEQ-F, and then optionally, the RBANS. In some cases the CEQ-F was omitted because it had been previously administered by a fellow researcher (whose test data I then used).

Before administering the battery I always explained the purpose of the study and stressed its confidentiality, bearing in mind the importance of truthful answers, whether positive or negative in nature. I also made patients aware that they would have the option to view their data after the study was completed.

Given the use of psychoactive plants in Takiwasi, when filling out tests I also asked patients to think about their life in general within Takiwasi, with the exclusion of occurrences inside ayahuasca ceremonies specifically. However, mental states occurring within an ayahuasca session which then persisted into normal daily life were to be included. This is because ayahuasca induces an exceptionally irregular state of consciousness that most psychometric instruments are not designed to accommodate. For example, perceived confrontations with death or intense cathartic expressions of grief can be relatively common experiences within an ayahuasca ceremony; however, these experiences should not be taken as indications of psychopathology when confined to the ritual session. On the other hand, the persistence of morbid thoughts or unrelenting grief within daily life must be taken into account.

Neuropsychological test battery

Testing took place in a quiet room with the participant and myself, and I recorded the sessions for later scoring verification. Test administration was carried out in accordance with the RBANS manual specifications (Randolph, 2012).

Analyses

All statistical analyses were conducted using R (R Core Team, 2017). Plots were generated using *ggplot2* (Wickham, 2009), correlations with *psych* (Revelle, 2017), Hedges' *g* with *effsize* (Torchiano, 2017), and mixed-effects models with *lme4* (using the default "profile" method from *confint.merMod* for confidence intervals; Bates, Mächler, Bolker, & Walker, 2015). Model significance tests were generated with *lmerTest* (Kuznetsova, Bruun Brockhoff, & Haubo Bojesen Christensen, 2016), and model effects for plotting were extracted with *effects* (J. Fox, 2003). Influence statistics for the models were examined using *influence.ME* (Nieuwenhuis, te Grotenhuis, & Pelzer, 2012). All other analyses made use of the base functions available in the R software distribution.

6.2 Results

ASI: Descriptive statistics and normative comparisons

Although the ASI was used as part of the study, Takiwasi has been administering it to patients on admission since 2009, and Table 6.2 shows comparisons of ASI scores for the study samples (main and neuropsychological), Takiwasi inpatients (years 2009 and 2012–2015), and inpatients in residential treatment centres across the United States (years 2003–2006; McLellan et al., 2006).

Table 6.2

ASI: Study sample comparisons

	Main ^a	Neuropsych ^b	Takiwasi records ^c	USA inpatients ^d
Dimension	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Medical	.20 (.30)	.22 (.36)	.22 (.30)	.16 (.29)
Employment	.59 (.31)	.66 (.32)	.60 (.29)	.65 (.32)
Alcohol	.33 (.29)	.35 (.33)	.31 (.29)	.33 (.27)
Drug	.24 (.13)	.23 (.06)	.24 (.14)	.11 (.14)
Legal	.23 (.22)	.17 (.17)	.21 (.21)	.20 (.22)
Family	.41 (.21)	.48 (.14)	.40 (.21)	.15 (.21)
Psychiatric	.39 (.22)	.44 (.21)	.40 (.22)	.20 (.24)

Note. Bold mean values are significantly different ($p < .05$) to their corresponding USA inpatient population mean values (McLellan, Cacciola, Alterman, Rikoon, & Carise, 2006) on a one-sample t test.

^a $N = 36$. ^b $n = 8$. ^c $N = 78$. ^d $n = 3,133$.

According to one-sample t tests for Takiwasi inpatients ($N = 78$), means on the dimensions of Drug, $t(77) = 8.19$, $p = <.001$, 95% CI [0.21, 0.27]; Family, $t(77) = 10.30$, $p = <.001$, CI [0.35, 0.44]; and Psychiatric, $t(77) = 8.14$, $p = <.001$, CI [0.35, 0.45] are significantly higher than United States 2006 inpatient population means. Similar t test results were found for the main and neuropsychological samples, and are therefore not reported in detail.

Although cross-cultural normative comparisons can be risky, the large difference in scores for three dimensions (and consistency in the remaining four) are suggestive of an increased severity of drug, family and social, and mental illness problems³ in Takiwasi patients when compared with the United States inpatient average. Further support for this notion comes from the non-substance abuse psychiatric disorder cut-off scores developed by Cacciola, Pecoraro, and Alterman (2008), where ASI Psychiatric scores $\geq .16$ for male substance abusers were predictive of a co-occurring disorder. This places the Takiwasi inpatient mean a full standard deviation above the cut-off.

³Psychiatric scores comparable to Takiwasi inpatients can be found in Weisner, McLellan, and Hunkeler (2000), who reported a mean of .34 ($SD = .24$) in 199 males undergoing substance abuse treatment.

These score differences are perhaps not surprising as Takiwasi, unlike many US treatment centres, are not required to accept patients mandated by courts to attend treatment and who in fact may not have severe addiction problems (e.g., Reisinger, 2004). During my fieldwork I also found that many patients had tried other treatment modalities and were attending Takiwasi as a (sometimes desperate) last resort, which again suggests a certain severity of addiction.

As a final point of comparison, ASI data collected by Fábregas et al. (2010) in Brazil demonstrate the range of scores that might be expected in non-addict populations. In samples of religious ayahuasca users and control groups from both jungle and urban areas, ASI composite score means ranged from .11–.27 (Medical), .40–.72 (Employment), .00–.02 (Alcohol), .00–.09 (Drug), .00–.01 (Legal), .05–.16 (Family), and .01–.11 (Psychiatric).

Main test battery results

Descriptive statistics and normative comparisons

Once again, although cross-cultural normative comparisons will certainly contain more error than usual, they are provided in Table 6.3 to provide approximate reference points for test score meaning. Means (± 1 *SD*) for Takiwasi inpatients on intake (O_1) and during treatment (O_2 – O_5) are contrasted against normative samples for each major summary score. Sample sizes for the main test battery, from O_1 – O_5 , were 22, 19, 18, 13, and 9.

Table 6.3

Main test battery: Normative comparisons

Dimension	Takiwasi inpatients		Normative samples	
	Intake ^a	Treatment ^b		
PSS-10			USA population ^c	
	24.7 ± 5.0	16.0 ± 6.1	15.5 ± 7.4	
SWBS			USA religious ^d	USA patients ^e
SWB	76.4 ± 21.3	93.8 ± 17.7	105.9 ± 12.6	83.7 ± 17.9
EWB	38.0 ± 9.6	47.6 ± 8.0	51.2 ± 7.3	38.8 ± 9.9
RWB	38.4 ± 13.8	46.2 ± 12.0	54.8 ± 6.1	44.9 ± 10.6
SF-36v2			USA population ^f	
PCS	47.9 ± 8.2	53.5 ± 6.4	50.0 ± 9.9	
MCS	30.3 ± 9.8	42.1 ± 8.1	50.0 ± 10.2	
BSI			USA non-patients ^g	USA outpatients ^h
GSI	1.5 ± 0.7	0.8 ± 0.6	0.2 ± 0.2	1.2 ± 0.7
PSDI	2.0 ± 0.6	1.5 ± 0.4	1.3 ± 0.4	2.0 ± 0.6
PST	37.0 ± 12.2	26.5 ± 12.3	10.1 ± 8.3	29.4 ± 11.9
CEQ-F			Aust. alcohol ^{ik}	Aust. cigarette ^{jk}
	59.9 ± 25.3	18.6 ± 16.8	40.4 ± 23.3	47.4 ± 25.5

Note. Table values are means (± 1 SD).

^aPre-treatment inpatient scores (O_1); $N = 22$ ($N = 27$ for CEQ-F). ^bWithin-treatment inpatient scores (O_2 – O_5); $N = 59$ ($N = 61$ for CEQ-F). ^cGeneral population males; $N = 968$ (S. Cohen & Janicki-Deverts, 2012). ^dConservative Baptists; $N = 285$ (Bufford, Paloutzian, & Ellison, 1991). ^eMental health patients; $N = 182$ (Bufford, Paloutzian, & Ellison, 1991). ^fGeneral population; $N = 4,024$ (Maruish, 2011). ^gNon-patient males; $N = 361$ (Derogatis, 1993). ^hPsychiatric outpatient males; $N = 425$ (Derogatis, 1993). ⁱAustralian alcohol outpatients; $N = 276$ (May et al., 2014). ^jAustralian non-patient smokers (five hours abstinence); $N = 59$ (May et al., 2014). ^kCalculated from the May et al. (2014) dataset (J. May, personal communication, February 2, 2016).

Descriptive statistics plots

Plots of means are presented for the global measures of each test in the main battery (and subscales where interesting). For the most important measures, plots of individual raw scores are also presented. The dotted lines connecting points are for visual aid only and do not necessarily imply change over time, as the data are a mix of repeated-measures and cross-sectional measurement.⁴ Tests for change over time must allow for missing data and are therefore constructed using mixed-effects modelling (which will be presented in the coming section).

⁴For example, very few patients who have scores at O_1 will also have scores at O_5 .

PSS-10 Figure 6.1 contains means (± 1 SD) and raw scores with a Loess smoother applied for the PSS-10 global score.

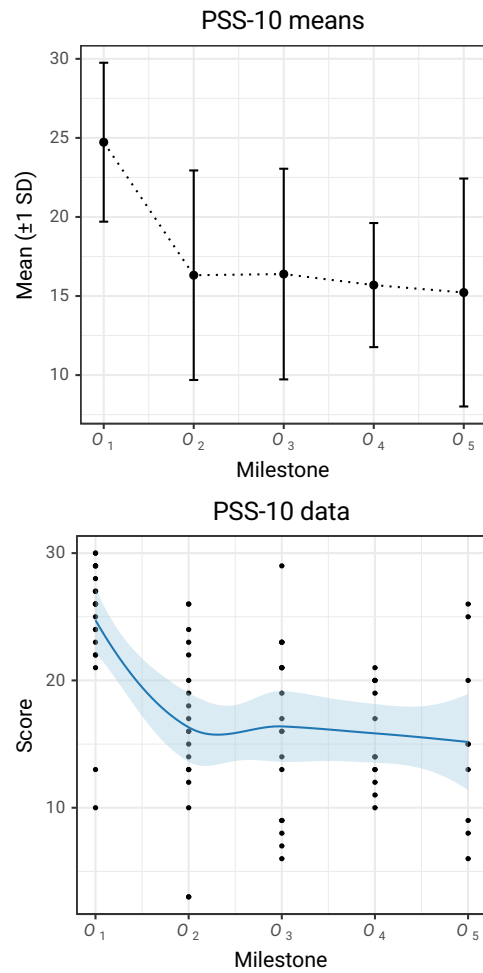


Figure 6.1
PSS-10: Descriptive plot and raw scores

SWBS Figure 6.2 contains means (± 1 SD) and raw scores with a Loess smoother applied for the global SWB score. The EWB and RWB subscales are presented with means (± 1 SD) only. The patterns for the subscales appear to be largely similar, although there is less variation within EWB when compared to RWB.

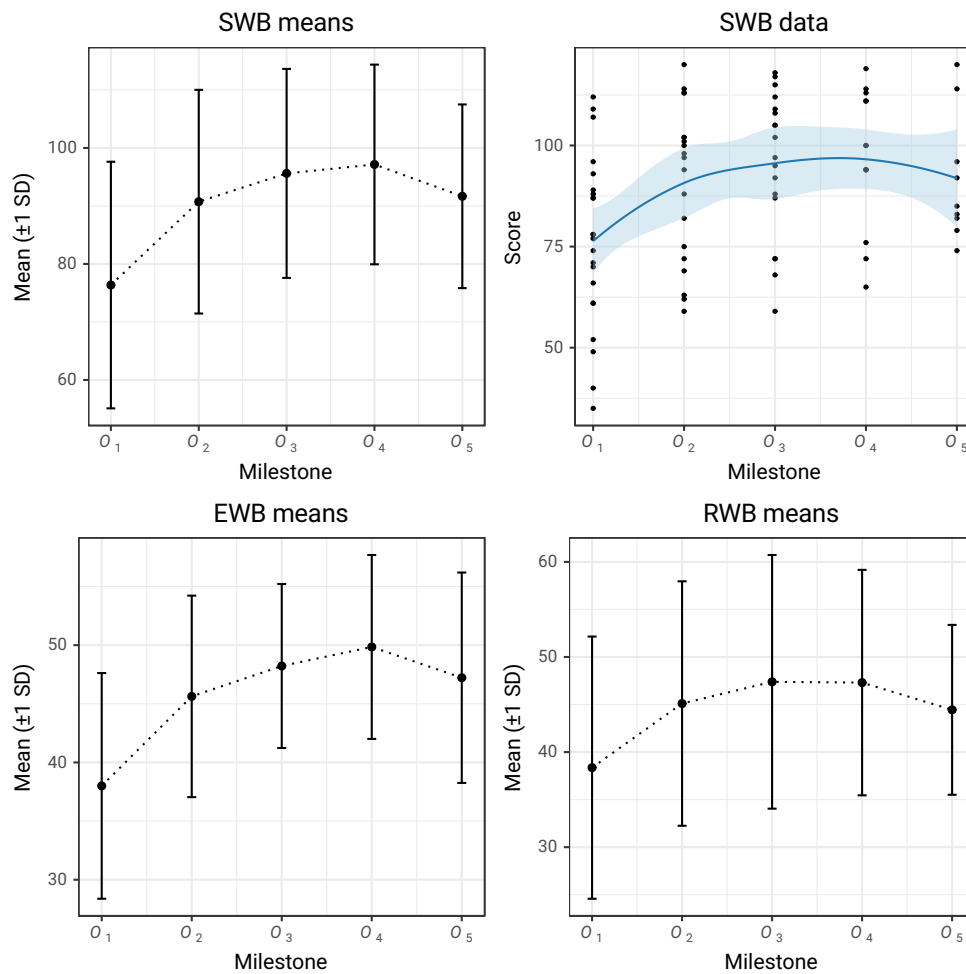


Figure 6.2
SWBS: Descriptive plots and raw scores

SF-36v2 Figure 6.3 contains means (± 1 SD) as well as raw scores with a Loess smoother applied for both the PCS and MCS global measures. MCS appears to be the more robust of the measures, although PCS was affected by an outlier case that followed a downward trajectory from O_2 – O_4 , but returned to an average score at O_5 .

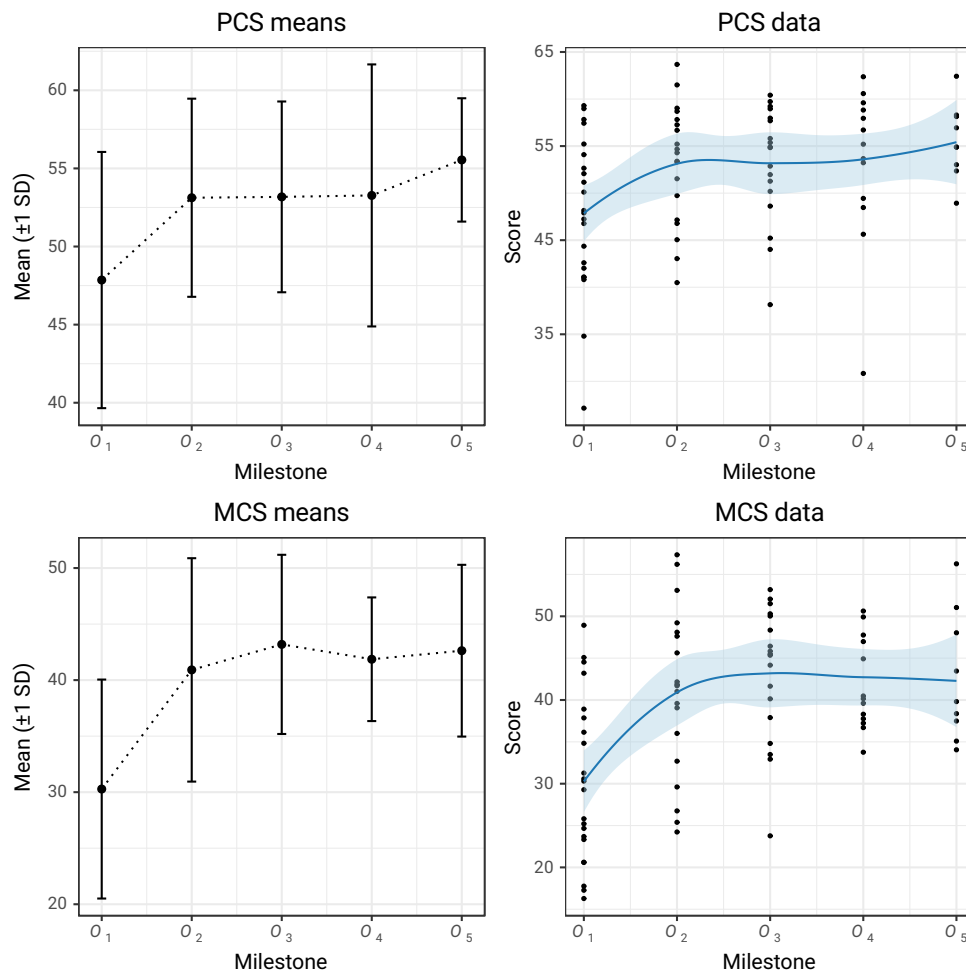


Figure 6.3
SF-36v2: Descriptive plots and raw scores for global measures

BSI Figure 6.4 contains means (± 1 SD) as well as raw scores with a Loess smoother applied for both the GSI and PSDI global measures. I examined plots for the BSI symptom dimensions but did not find sufficient deviation from the global score pattern to warrant their inclusion.

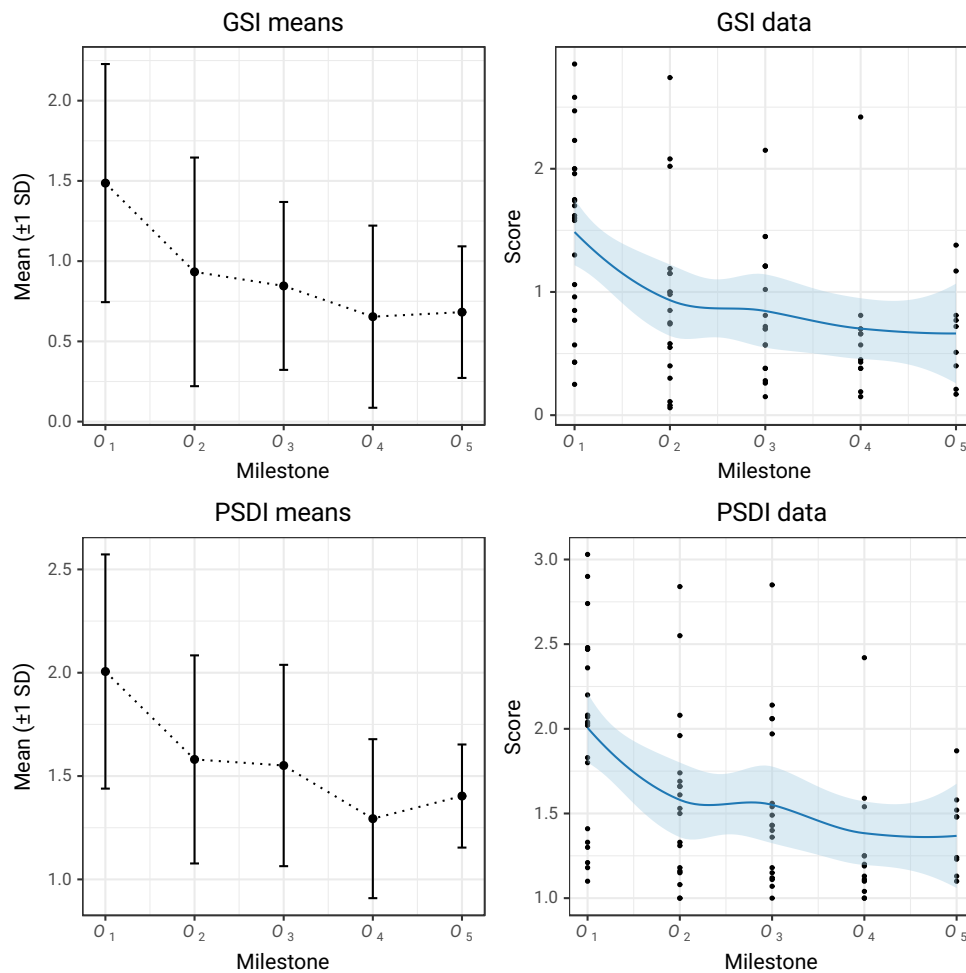


Figure 6.4

BSI: Descriptive plots and raw scores for global measures

CEQ-F Figure 6.5 contains means (± 1 SD) as well as raw scores with a Loess smoother applied for the global CEQ-F measure.

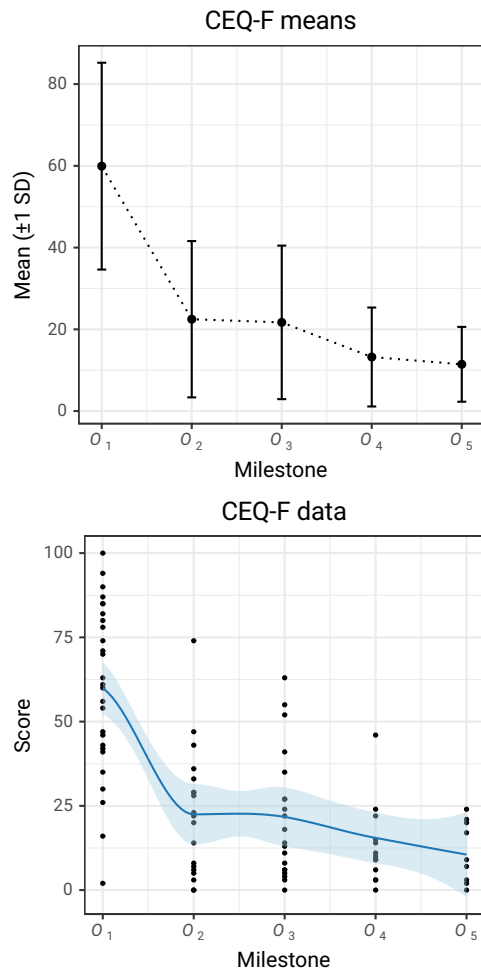


Figure 6.5
CEQ-F: Descriptive plot and raw scores

Modelling effects over time

Given that patients were not always measured on intake nor for the full duration of treatment, the proper analysis for change over time requires the ability to handle missing data, as well as the ability to account for the violation of statistical independence due to repeated-measures. Mixed-effects models are a sound way to conduct these analyses (Gibbons, Hedeker, & DuToit, 2010; Gueorguieva & Krystal, 2000), and such models are presented here as the principal test for within-treatment psychological change.

For every psychological mixed-effect model, the fixed-effect is the ordinal “treatment milestone” whereas the random-effect is the patient. Models were generated with random intercept only, as well as with both random intercept and random slope. However, the addition of a random slope was generally not deemed worthwhile according to Akaike information criteria (AIC) values.⁵ Omitting a random slope makes the modelling assumption of one underlying effect of treatment (or spent time in Takiwasi) that is invariant across patients. As will be seen from individual patient trends on the various psychological tests, this seems to be a reasonably valid assumption.

To assist in the interpretation of the models, normative data from Table 6.3 has been included along with model effects (which in effect constitute best predictions, based on the available data, of what could be expected for a hypothetical Takiwasi patient). No cases were excluded from the test data provided by the 36 patients. Once again, the sample sizes for each milestone (from O_1 – O_5) were: 22, 19, 18, 13, and 9.

PSS-10

Figure 6.6 shows individual PSS-10 trends over time, whereas model effects and coefficients are found in Figure 6.7 and Table 6.4 respectively. For the model coefficients, the “Estimate” at O_1 represents a Takiwasi patient’s predicted PSS-10 score on intake (i.e., the model intercept), whereas each subsequent estimate value shows that milestone’s predicted difference with respect to O_1 . Lower PSS-10 scores indicate either lower perceived stress, more successful coping, or a combination of the two. For Takiwasi patients stress scores tend to be quite high on intake to treatment, and steadily decrease in most cases to around or below the United States average (S. Cohen & Janicki-Deverts, 2012).

⁵More precisely, according to the AICc adjustment for small samples (Bartoń, 2016).

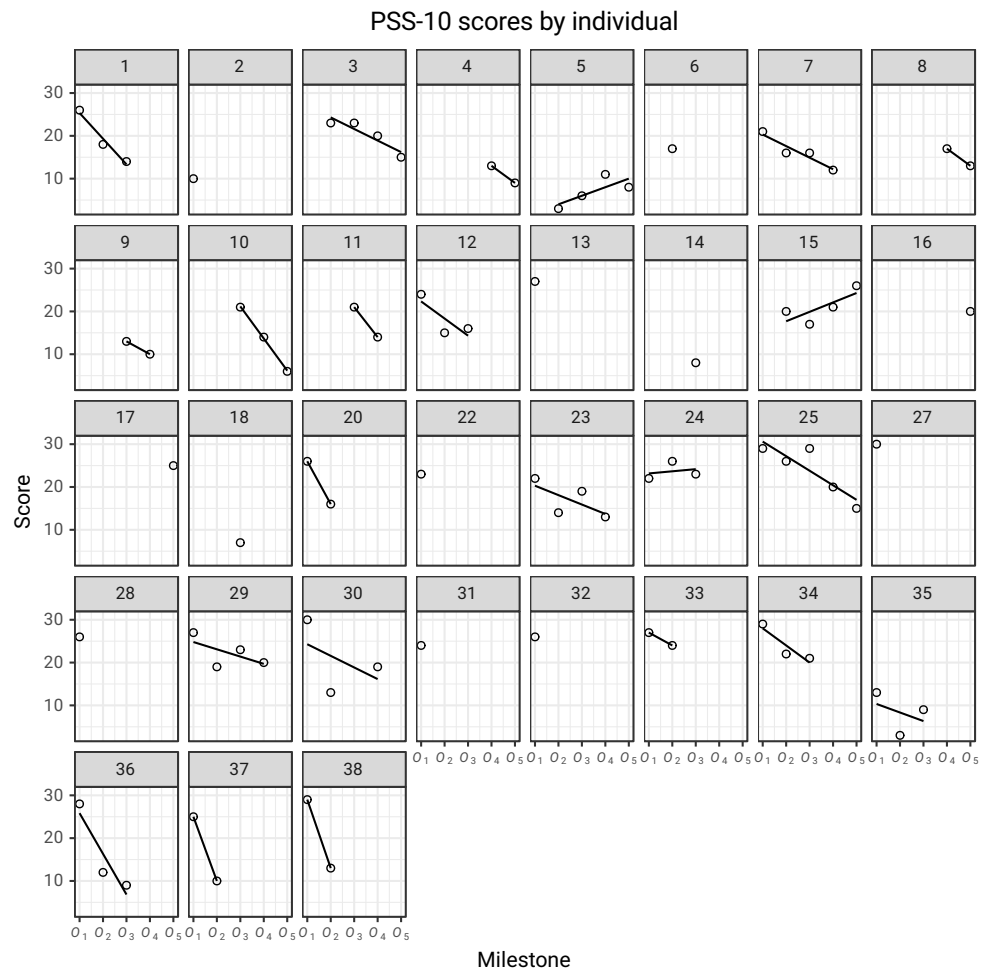


Figure 6.6
PSS-10: Individual trends over time

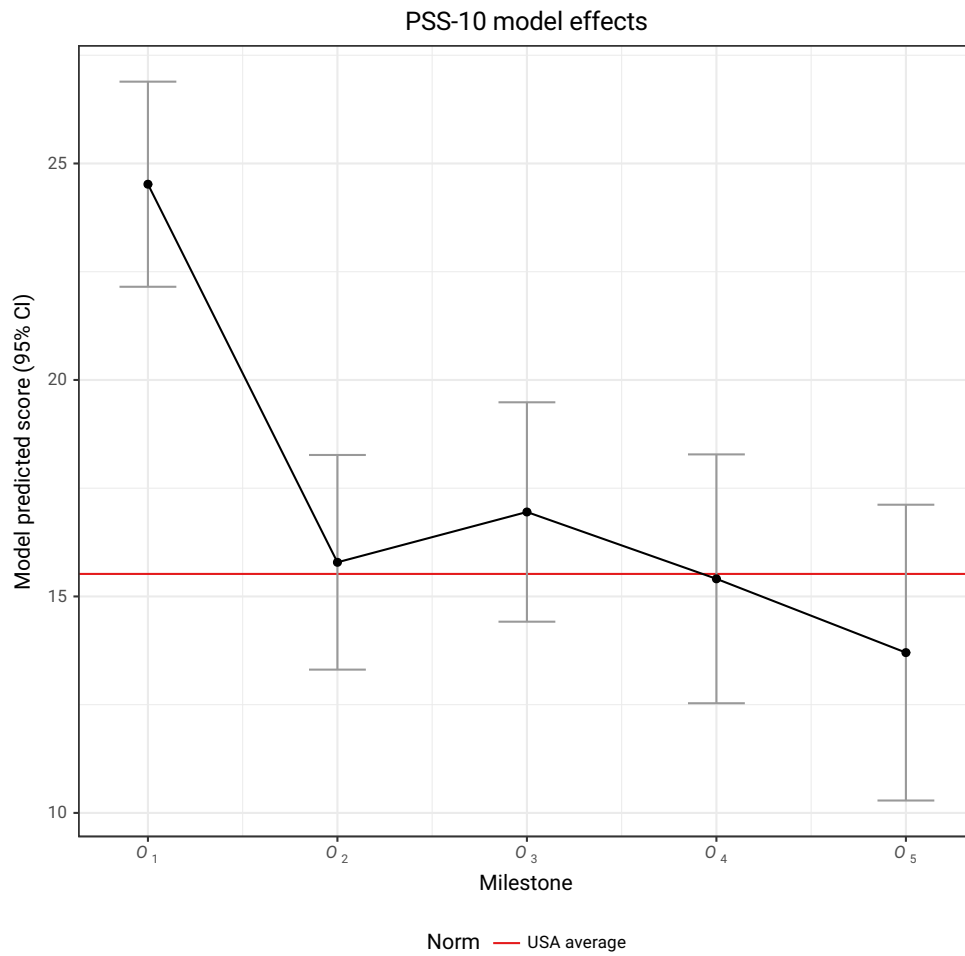


Figure 6.7
PSS-10: Model fixed-effects

Table 6.4
PSS-10: Model coefficients

Milestone	Estimate	Std. Error	df	t	p	95% CI ^a
O_1	24.5	1.2	64.5	20.6	<.001	[22.2, 26.8]
O_2	-8.7	1.3	48.5	-6.7	<.001	[-11.2, -6.2]
O_3	-7.6	1.4	54.5	-5.4	<.001	[-10.3, -4.9]
O_4	-9.1	1.6	56.9	-5.7	<.001	[-12.2, -6.0]
O_5	-10.8	1.9	64.2	-5.7	<.001	[-14.5, -7.1]

^aFor the model estimates.

SWBS

Figure 6.8 shows individual SWB trends over time, whereas model effects and coefficients are found in Figure 6.9 and Table 6.5 respectively. As there are some interesting differences between the RWB and EWB sub-scales (particularly with respect to normative values), individual trends, model effects, and model coefficients are also provided. For all three scales, higher scores indicate higher levels of well-being. When examining the Takiwasi patients, their SWB scores tend to start low and steadily increase. However, there are instances where scores drop towards the end of treatment, and thus there is less certainty in the modelling at O_5 .

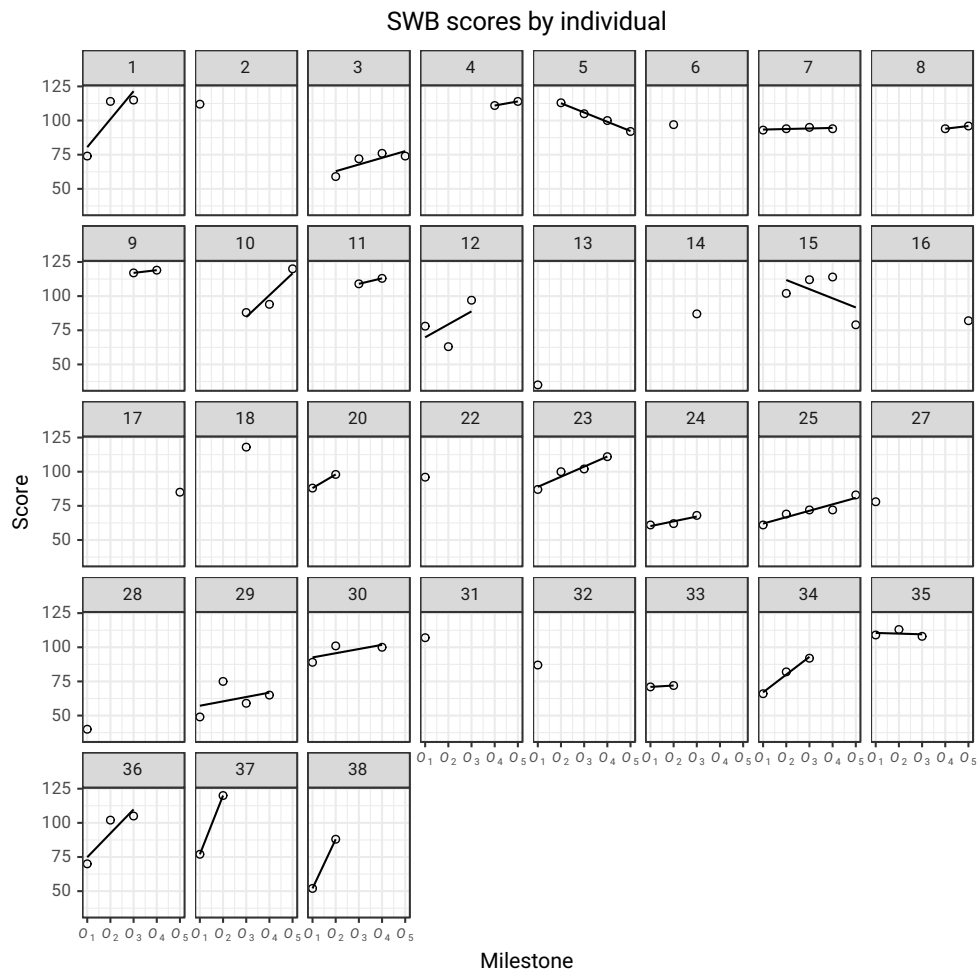


Figure 6.8

SWB: Individual trends over time

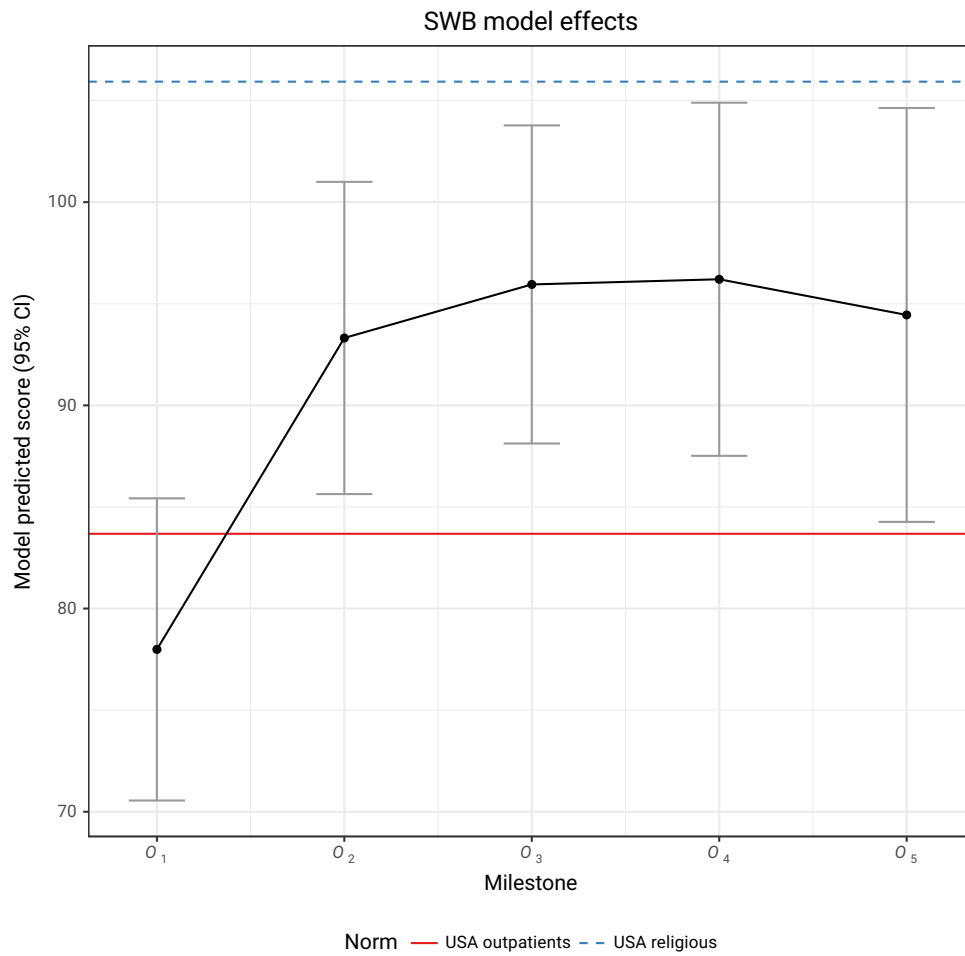


Figure 6.9
SWB: Model fixed-effects

Table 6.5
SWB: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
<i>O</i> ₁	78.0	3.7	58.1	20.9	<.001	[70.8, 85.3]
<i>O</i> ₂	15.3	3.6	46.8	4.3	<.001	[8.4, 22.2]
<i>O</i> ₃	18.0	3.9	51.2	4.6	<.001	[10.5, 25.5]
<i>O</i> ₄	18.2	4.5	52.6	4.1	<.001	[9.7, 26.8]
<i>O</i> ₅	16.5	5.4	58.5	3.0	<.01	[6.1, 26.8]

^aFor the model estimates.

As an SWB score is simply a composite of the RWB and EWB scores, it is interesting to compare those models in terms of their relative position to normative data, particularly with reference to O_5 (where the SWB model shows less confidence). RWB individual trends, model effects, and model coefficients are provided in Figure 6.10, Figure 6.11, and Table 6.6, and likewise for EWB in Figure 6.12, Figure 6.13, and Table 6.7.

While the RWB and EWB models share the same sharp increase from O_1 – O_2 , it seems that not all patients are sustaining an increase for RWB, whereas EWB scores do tend to keep rising. In effect, the models suggest that while Takiwasi patients may not all be receiving sustained increases in terms of explicit religiosity, they are quite likely achieving levels of existential well-being comparable to that of religious people.

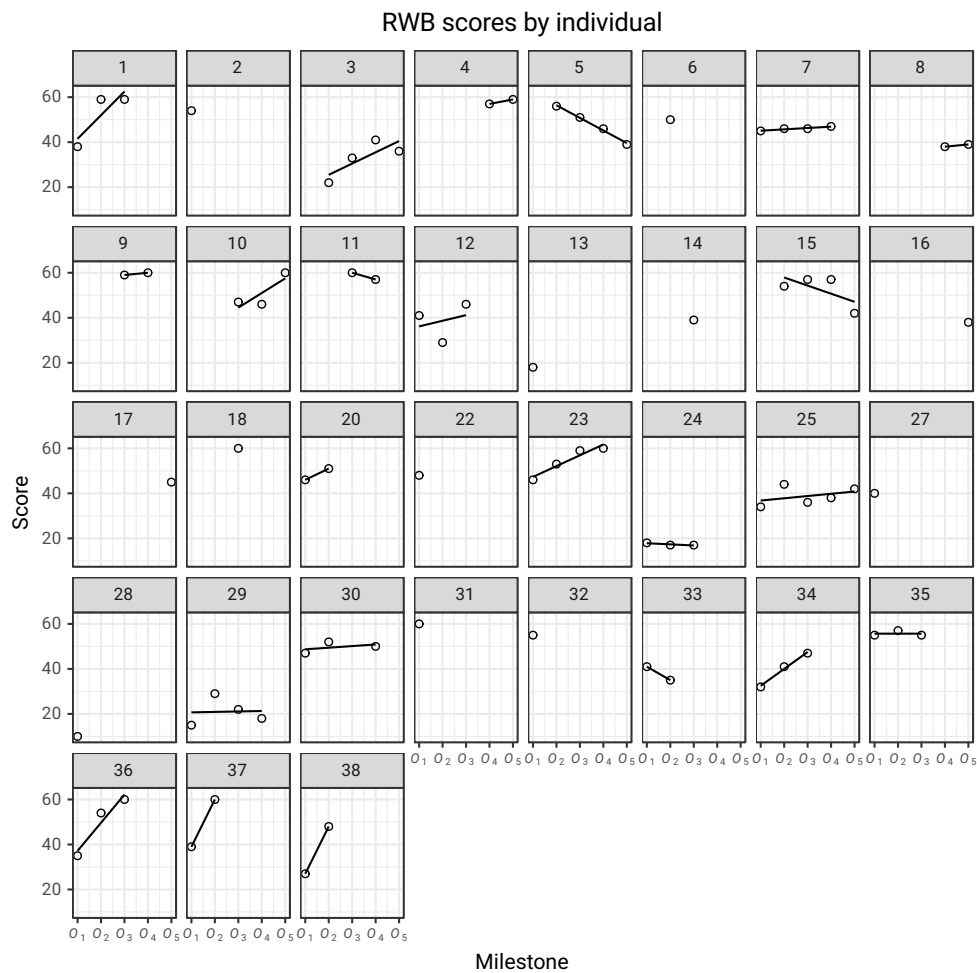


Figure 6.10
RWB: Individual trends over time

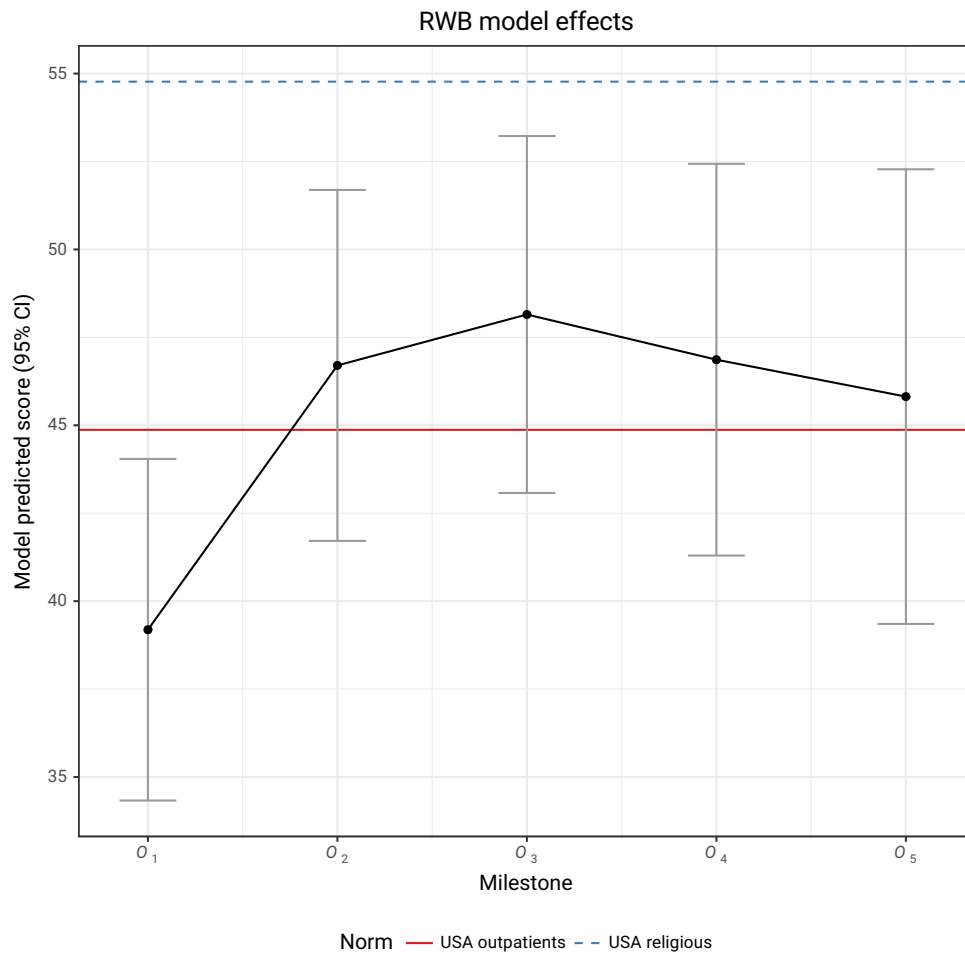


Figure 6.11
RWB: Model fixed-effects

Table 6.6
RWB: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
O_1	39.2	2.4	55.5	16.1	<.001	[34.5, 43.9]
O_2	7.5	2.2	46.8	3.4	<.01	[3.3, 11.7]
O_3	9.0	2.4	50.4	3.8	<.001	[4.4, 13.5]
O_4	7.7	2.7	51.5	2.8	<.01	[2.5, 12.9]
O_5	6.6	3.3	56.5	2.0	.05	[0.3, 13.0]

^aFor the model estimates.

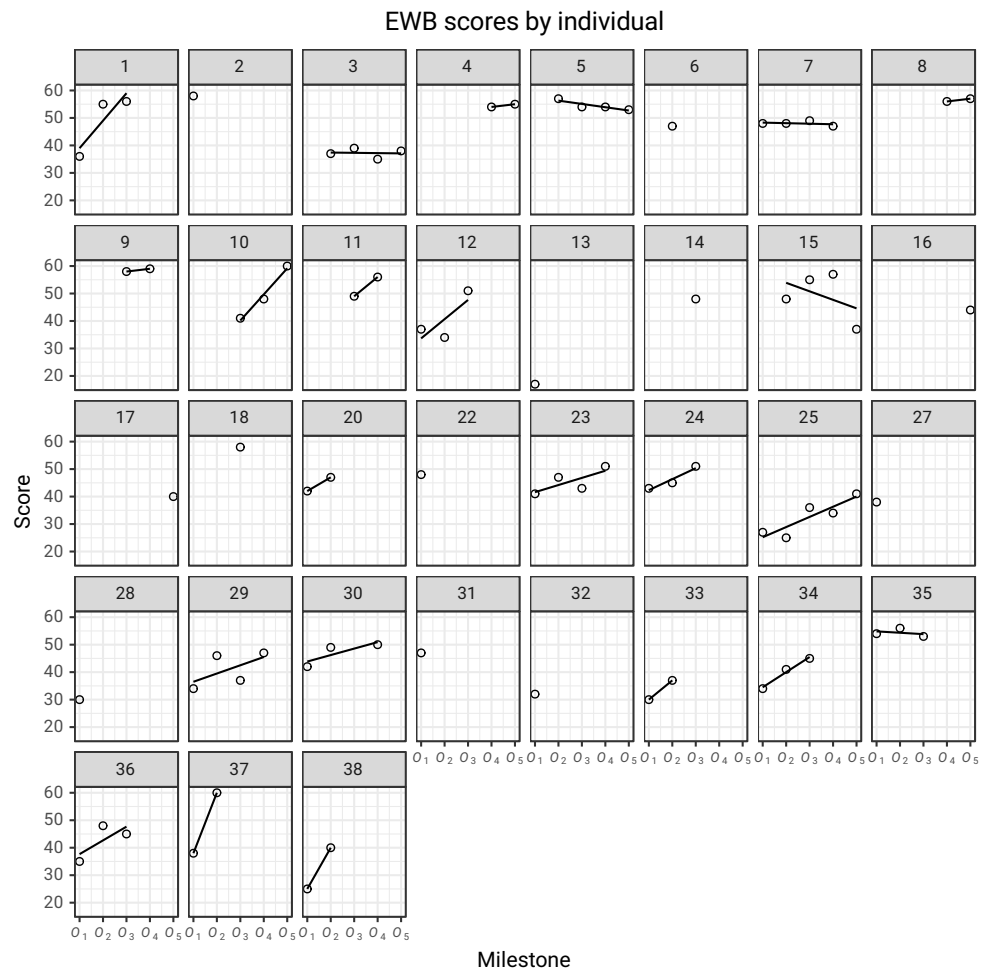


Figure 6.12

EWB: Individual trends over time

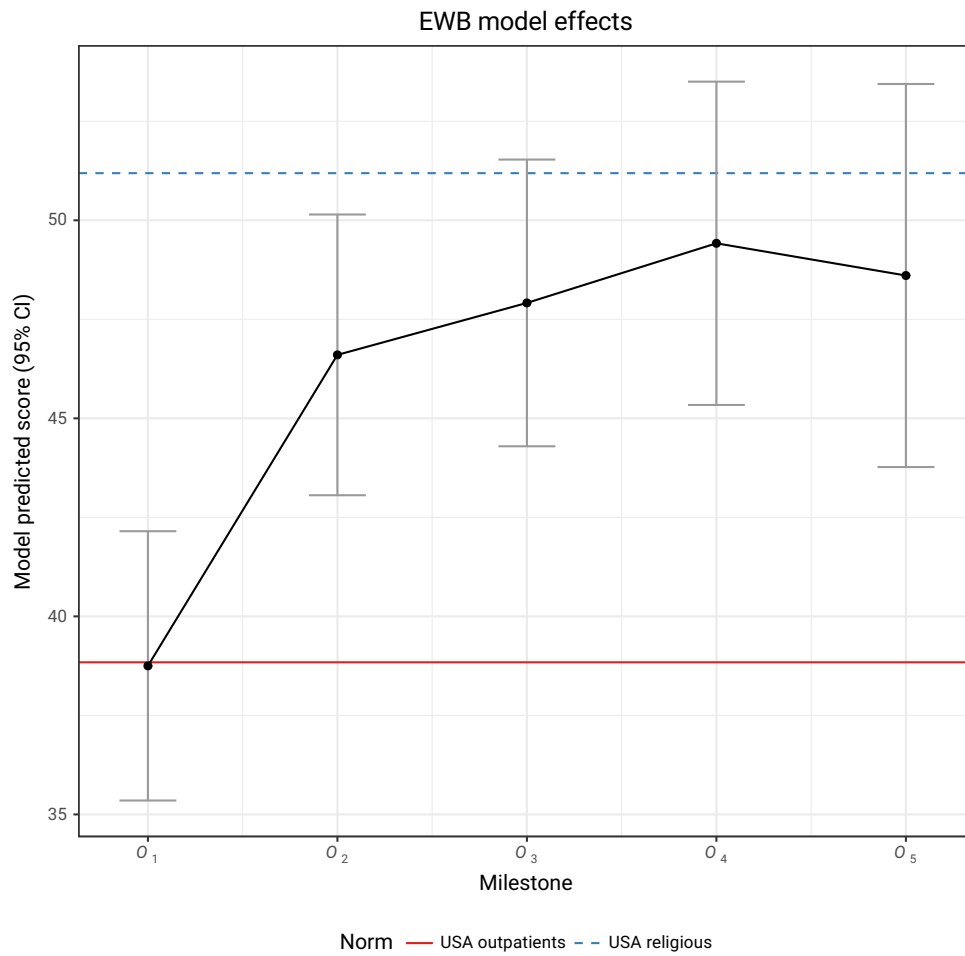


Figure 6.13
EWB: Model fixed-effects

Table 6.7
EWB: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
O_1	38.8	1.7	62.4	22.7	<.001	[35.5, 42.1]
O_2	7.9	1.8	47.5	4.3	<.001	[4.4, 11.3]
O_3	9.2	2.0	53.1	4.7	<.001	[5.4, 12.9]
O_4	10.7	2.2	55.2	4.8	<.001	[6.4, 15.0]
O_5	9.9	2.7	62.2	3.7	<.001	[4.7, 15.0]

^aFor the model estimates.

SF-36v2

For the SF-36v2 global measures, PCS individual trends, models effects, and model coefficients are found in Figure 6.14, Figure 6.15, and Table 6.8 respectively, and similarly for the MCS in Figure 6.16, Figure 6.17, and Table 6.9. Higher PCS scores indicate higher perceived physical health, whereas higher MCS scores indicate elevated perceptions of emotional health. While a moderate increase in physical health perception is likely for Takiwasi patients, large increases in emotional health are even more likely.

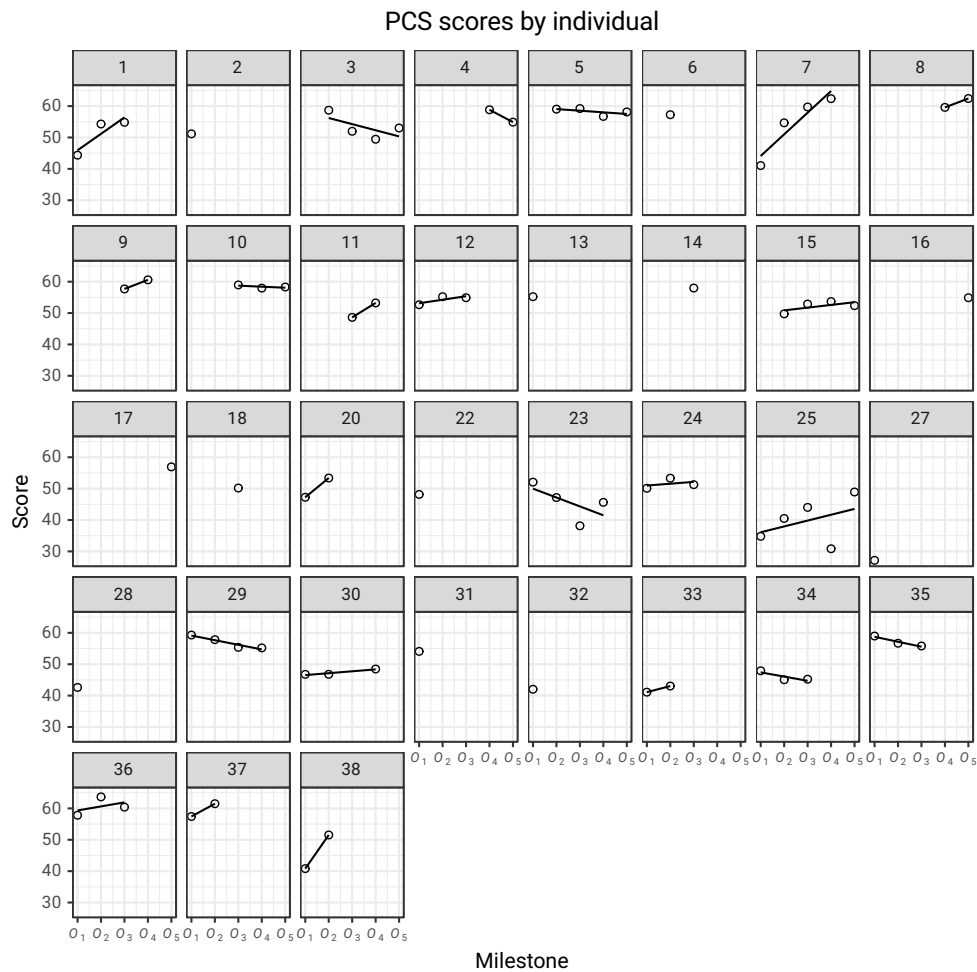


Figure 6.14

PCS: Individual trends over time

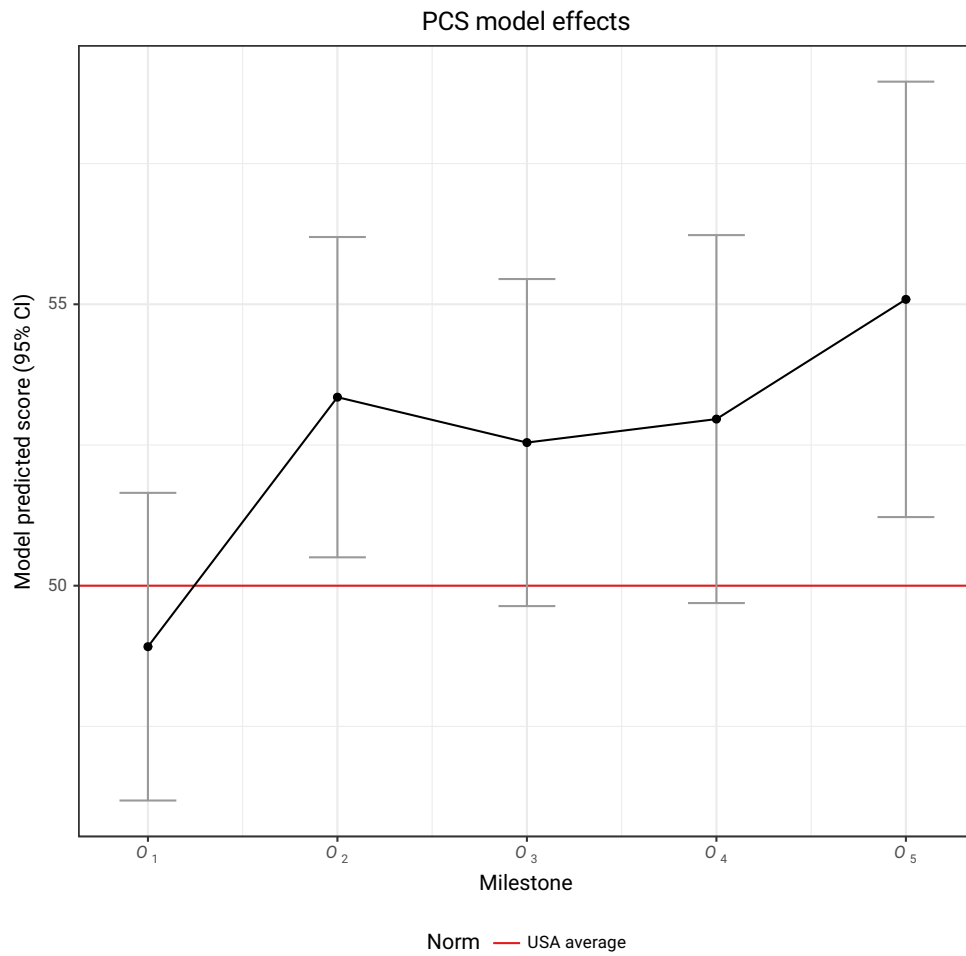


Figure 6.15
PCS: Model fixed-effects

Table 6.8
PCS: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
<i>O</i> ₁	48.9	1.4	62.6	35.6	<.001	[46.3, 51.6]
<i>O</i> ₂	4.4	1.4	48.6	3.1	<.01	[1.7, 7.2]
<i>O</i> ₃	3.6	1.5	53.9	2.3	.02	[0.6, 6.7]
<i>O</i> ₄	4.0	1.8	55.8	2.3	.03	[0.6, 7.5]
<i>O</i> ₅	6.2	2.1	62.5	2.9	<.01	[2.0, 10.3]

^aFor the model estimates.

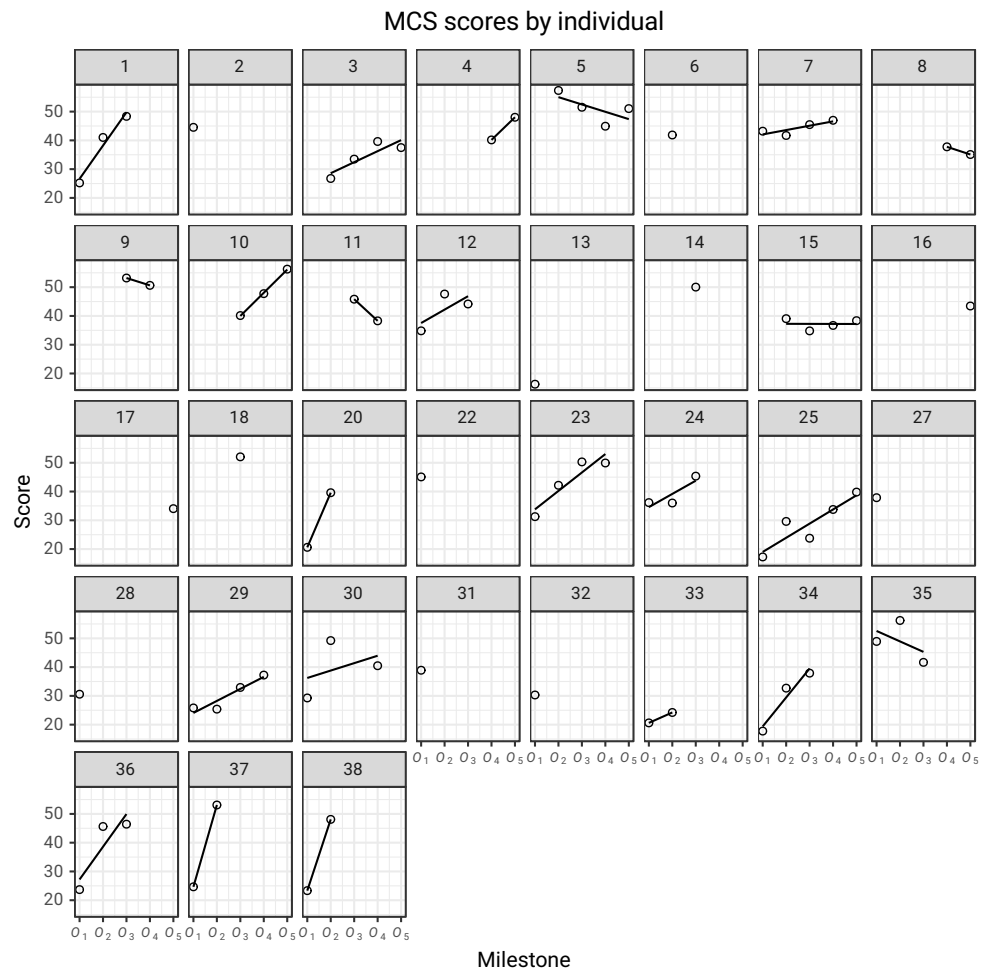


Figure 6.16

MCS: Individual trends over time

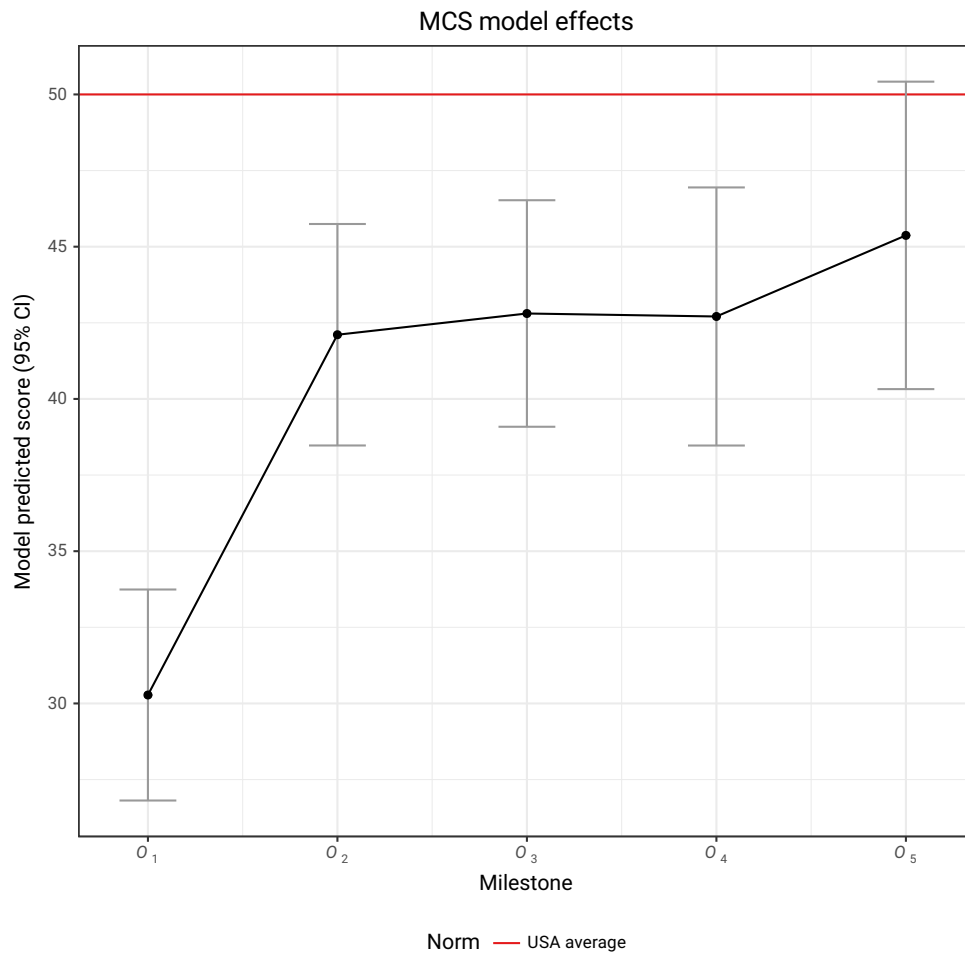


Figure 6.17
MCS: Model fixed-effects

Table 6.9
MCS: Model coefficients

Milestone	Estimate	Std. Error	df	t	p	95% CI ^a
O_1	30.3	1.7	66.4	17.4	<.001	[26.9, 33.6]
O_2	11.8	2.0	50.1	6.0	<.001	[8.0, 15.6]
O_3	12.5	2.1	56.4	6.0	<.001	[8.5, 16.6]
O_4	12.4	2.4	58.9	5.2	<.001	[7.8, 17.0]
O_5	15.1	2.8	66.0	5.3	<.001	[9.5, 20.7]

^aFor the model estimates.

BSI

For the BSI global measures, GSI individual trends, model effects, and model coefficients are found in Figure 6.18, Figure 6.19, and Table 6.10 respectively, with similar presentation for the PSDI in Figure 6.20, Figure 6.21, and Table 6.11. Lower GSI scores demonstrate a reduction in mental illness symptoms, whereas lower PSDI scores reflect a minimizing style when describing mental health issues. As can be seen, the patient trends and models for the GSI and PSDI are quite similar, and in general a linear decrease in scores for both measures can be expected.

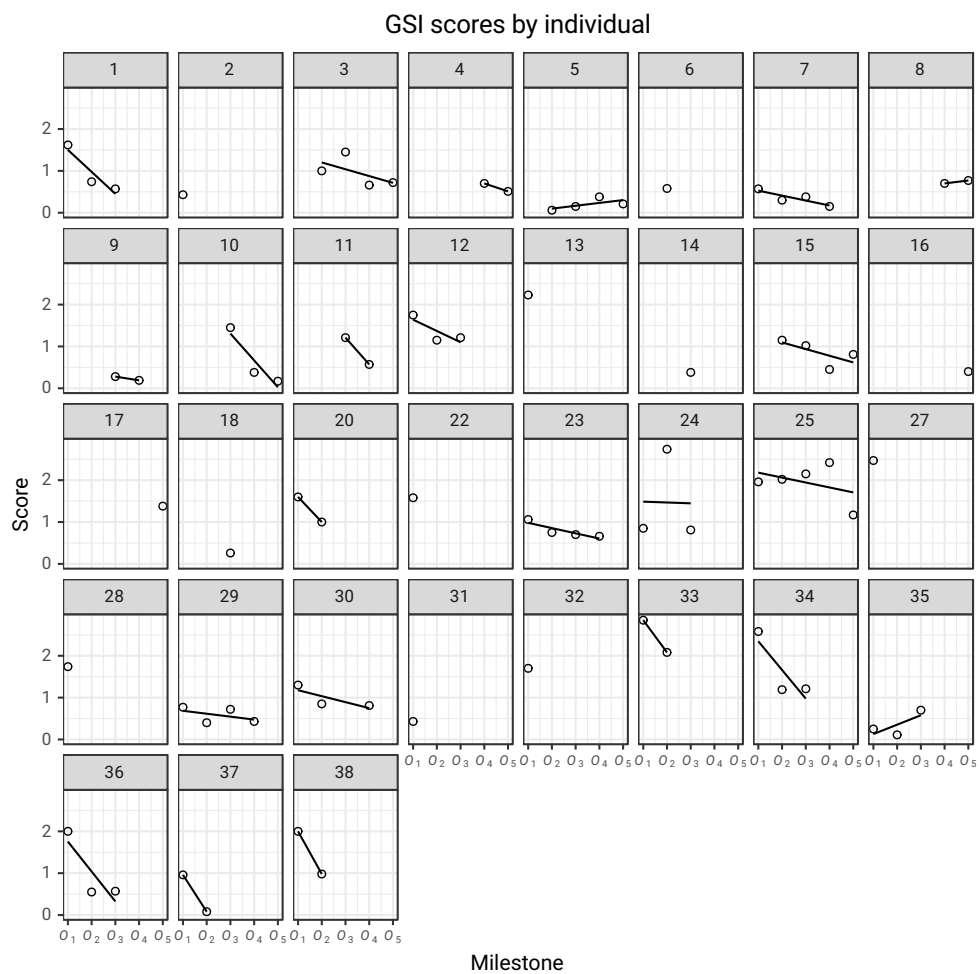


Figure 6.18

GSI: Individual trends over time

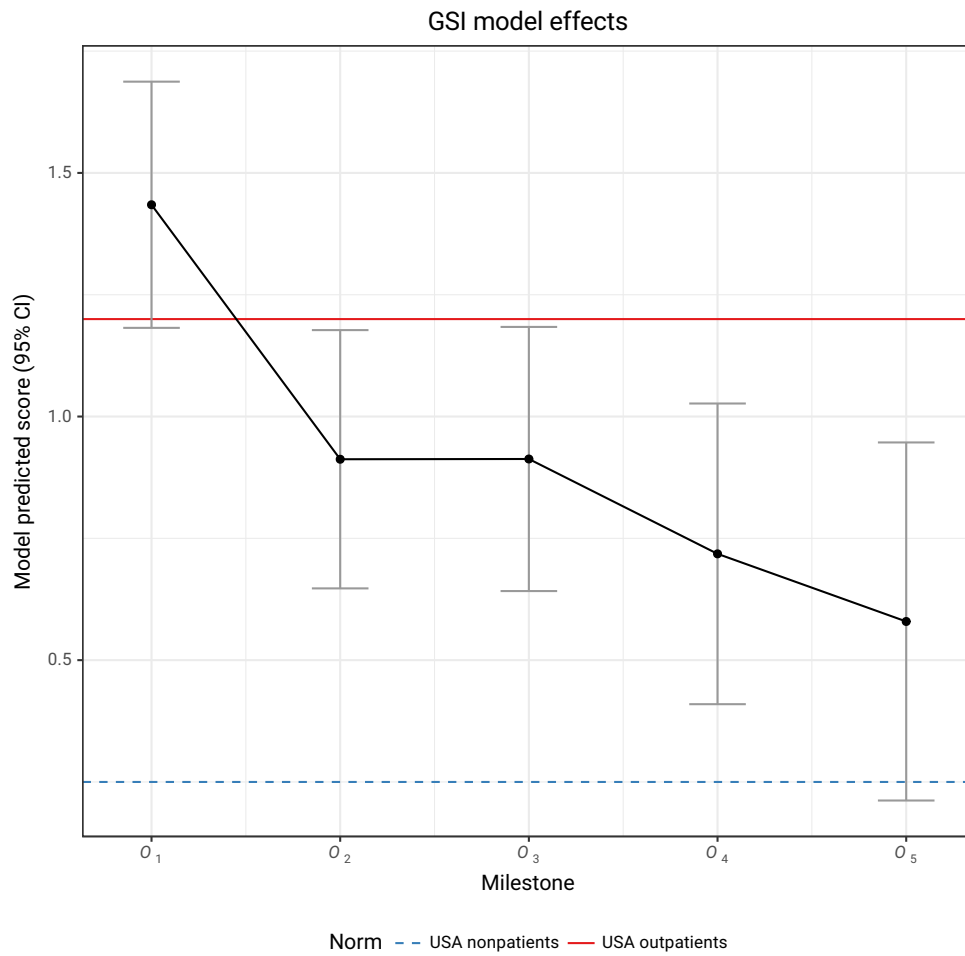


Figure 6.19
GSI: Model fixed-effects

Table 6.10
GSI: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
O_1	1.43	0.13	66.3	11.3	<.001	[1.2, 1.7]
O_2	-0.52	0.14	50.3	-3.7	<.01	[-0.8, -0.2]
O_3	-0.52	0.15	56.4	-3.4	<.01	[-0.8, -0.2]
O_4	-0.72	0.17	58.9	-4.1	<.001	[-1.1, -0.4]
O_5	-0.86	0.21	65.9	-4.1	<.001	[-1.3, -0.5]

^aFor the model estimates.

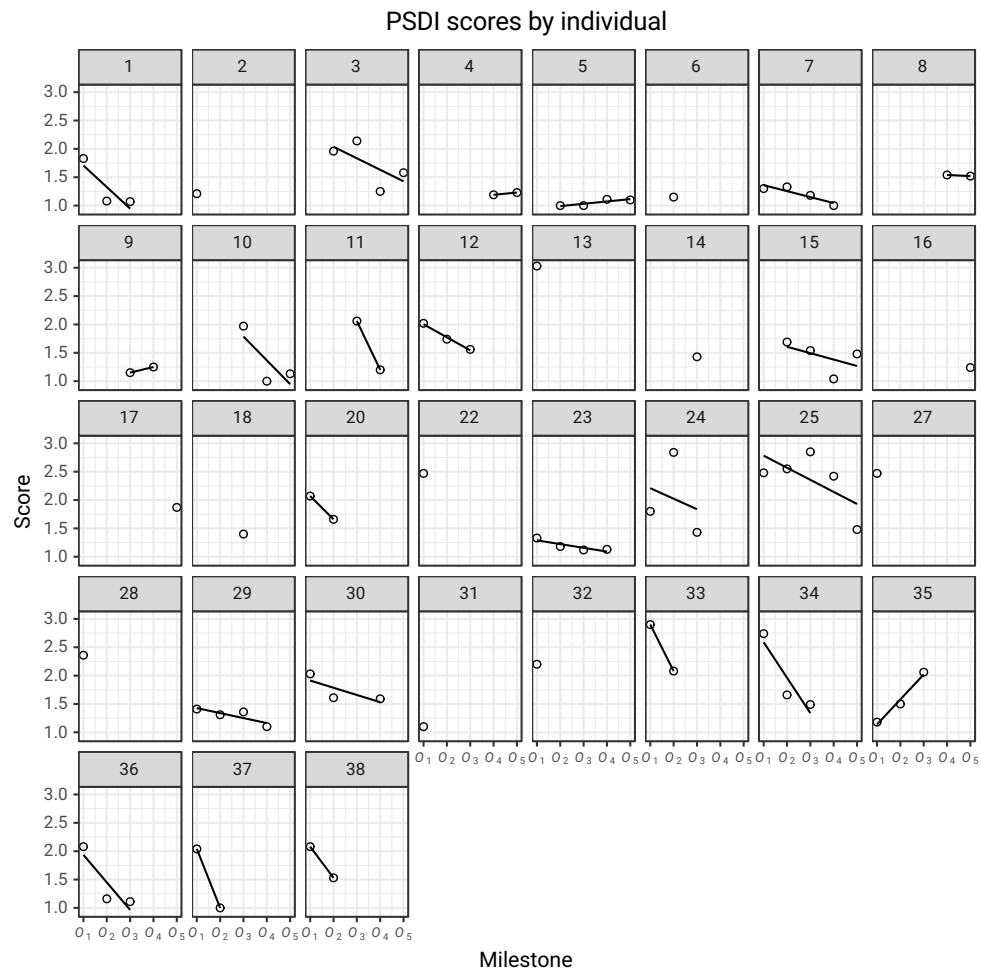


Figure 6.20
PSDI: Individual trends over time

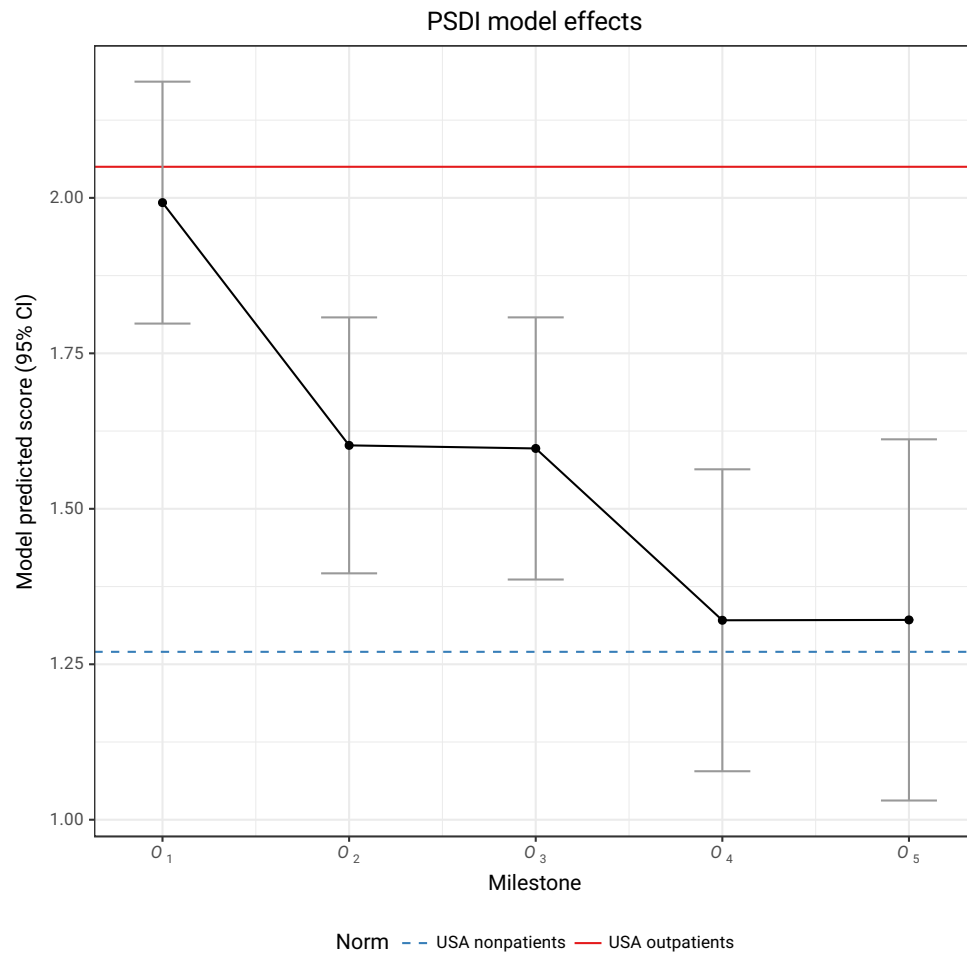


Figure 6.21
PSDI: Model fixed-effects

Table 6.11
PSDI: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
<i>O</i> ₁	1.99	0.10	70.0	20.4	<.001	[1.8, 2.2]
<i>O</i> ₂	−0.39	0.12	52.2	−3.3	<.01	[−0.6, −0.2]
<i>O</i> ₃	−0.40	0.13	59.3	−3.2	<.01	[−0.6, −0.2]
<i>O</i> ₄	−0.67	0.14	62.5	−4.7	<.001	[−0.9, −0.4]
<i>O</i> ₅	−0.67	0.17	69.4	−4.0	<.001	[−1.0, −0.3]

^aFor the model estimates.

CEQ-F

For the final psychological measurement, CEQ-F individual trends, model effects, and model coefficients are presented in Figure 6.22, Figure 6.23, and Table 6.12 respectively. Lower scores indicate a lower frequency of craving (over the past 30 days). The CEQ-F model is one of the strongest, with patient scores usually starting high (at a level that might be expected in a treatment facility), and then decreasing quite consistently over the course of time.

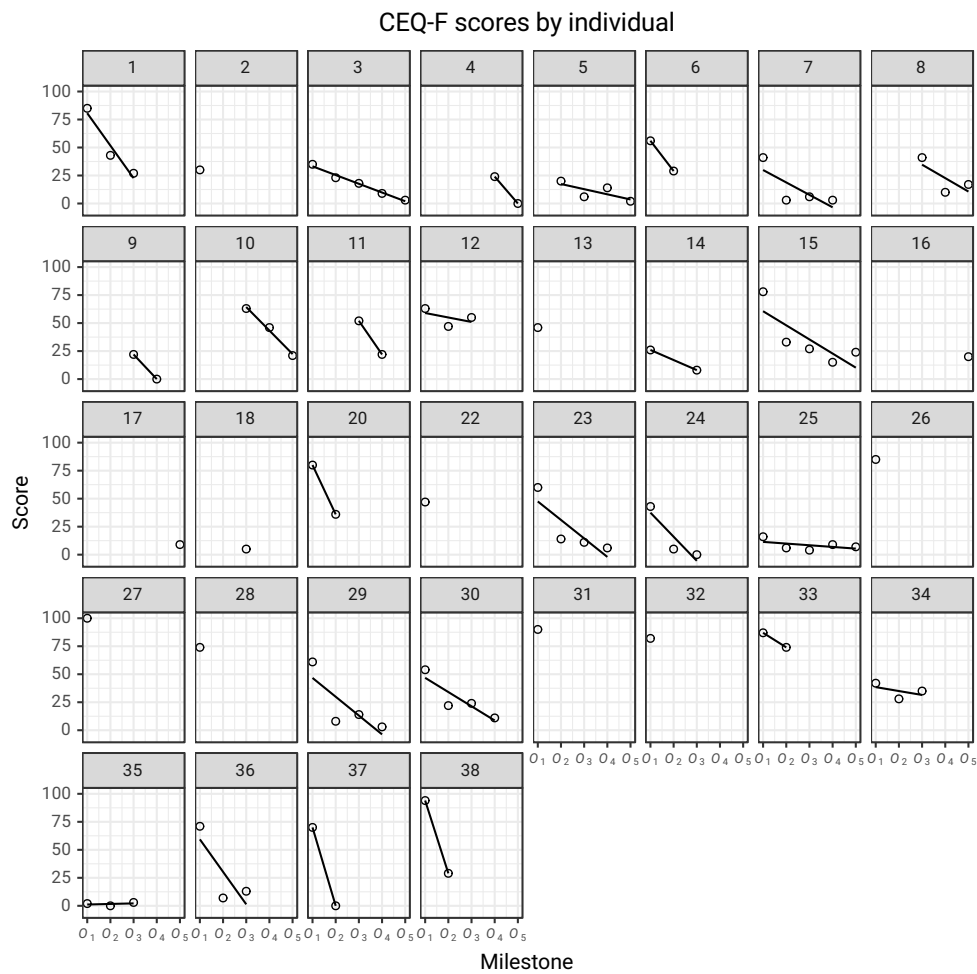


Figure 6.22
CEQ-F: Individual trends over time

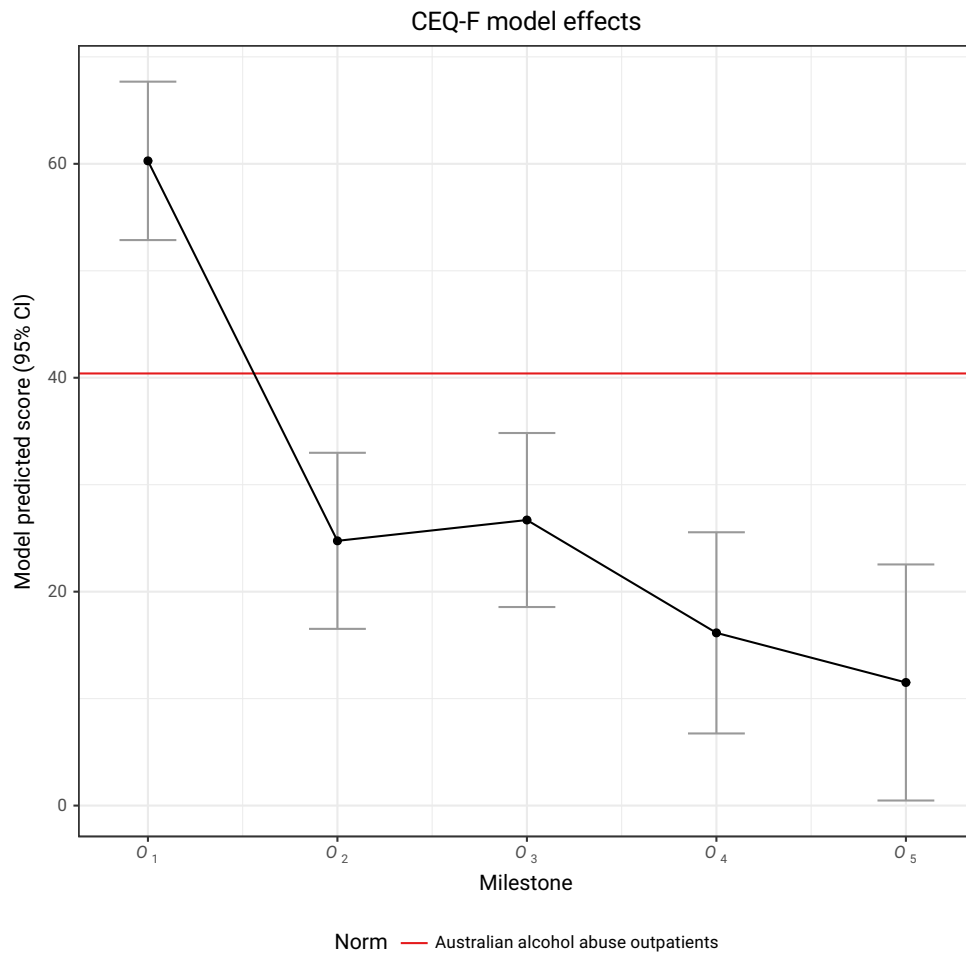


Figure 6.23
CEQ-F: Model fixed-effects

Table 6.12
CEQ-F: Model coefficients

Milestone	Estimate	Std. Error	df	<i>t</i>	<i>p</i>	95% CI ^a
<i>O</i> ₁	60.3	3.7	58.1	16.2	<.001	[53.0, 67.5]
<i>O</i> ₂	−35.5	3.9	51.9	−9.2	<.001	[−43.0, −28.1]
<i>O</i> ₃	−33.6	4.0	56.8	−8.4	<.001	[−41.5, −25.8]
<i>O</i> ₄	−44.1	4.8	58.7	−9.2	<.001	[−53.4, −34.9]
<i>O</i> ₅	−48.8	5.7	65.3	−8.5	<.001	[−59.8, −37.7]

^aFor the model estimates.

Other notable main test battery results

Although the mixed-effects modelling represents the principal test for within-treatment change over time in Takiwasi, there were two other informative findings in the main test battery. These were: (a) the reported health transition from the SF-36v2, and (b) the inter-test correlations.

Reported health transition Since the SF-36v2 RHT item measures perceived changes in general health over the last year, it is interesting to compare how Takiwasi patients responded to this item on entry versus during treatment (especially so given that treatment can last nine months, or even longer). Table 6.13 contains frequencies expressed as percentages for the five possible RHT responses for patients on intake and during treatment. Notably, there were no patients during treatment who described their general health as worse compared to one year ago, and very few who described it as the same, despite 54.5% describing it as either the same or worse on intake.

Table 6.13

SF-36v2 RHT: Intake versus treatment

	Intake ($n = 22$)	Treatment ($n = 59$)
RHT	%	%
Items		
Much better	4.5	67.8
Somewhat better	40.9	28.8
Same	31.8	3.4
Somewhat worse	18.2	0.0
Much worse	4.5	0.0
Grouped		
Better	45.5	96.6
Same	31.8	3.4
Worse	22.7	0.0

Inter-test correlations Pearson product-moment correlations amongst the main battery tests are provided in Table 6.14. The correlations show remarkable stability from pre-treatment to within-treatment, and in nearly all cases the correlations become stronger and more certain with treatment, with higher r values and narrower confidence intervals. The PSS-10 seems to be a particularly useful measure, carrying a strong association with most variables. During treatment higher stress is associated with lower SWB ($R^2 = .45$), PCS ($R^2 = .21$), and MCS ($R^2 = .62$), as well as higher GSI ($R^2 = .50$). The missing association between stress and craving during treatment stands out as reversing the trend however, and in

fact CEQ-F is the only test for which correlation values are consistently reduced during treatment.

Examining the PSS-10 and CEQ-F correlations in isolation gives pre-treatment $r(20) = .54$, $p = <.01$, $R^2 = .29$, and within-treatment $r(57) = .24$, $p = .06$, $R^2 = .06$ respectively. The weakening relationship between stress and craving may be indicative of a resilience process occurring for some patients, where stress does not trigger craving as powerfully as it once did.

Table 6.14

Inter-test correlations: Intake versus treatment

	Intake ($n = 22$)			Treatment ($n = 59$)		
	r	p	95% CI ^a	r	p	95% CI ^a
PSS-10–						
SWB	–.61	.03	[–.82, –.25]	–.67	<.001	[–.79, –.49]
PCS	–.39	.50	[–.70, .04]	–.46	<.01	[–.64, –.24]
MCS	–.72	<.01	[–.87, –.42]	–.79	<.001	[–.87, –.67]
GSI	.71	<.01	[.41, .87]	.71	<.001	[.55, .82]
CEQ-F	.54	.09	[.16, .78]	.24	.26	[–.01, .47]
SWB–						
PCS	.11	>.99	[–.33, .51]	.27	.20	[.01, .49]
MCS	.69	<.01	[.37, .86]	.64	<.001	[.46, .77]
GSI	–.54	.09	[–.78, –.15]	–.56	<.001	[–.71, –.36]
CEQ-F	–.18	>.99	[–.56, .26]	–.02	.88	[–.28, .23]
PCS–						
MCS	.08	>.99	[–.35, .49]	.33	.07	[.08, .54]
GSI	–.50	.13	[–.76, –.11]	–.61	<.001	[–.75, –.42]
CEQ-F	–.30	.90	[–.64, .14]	–.10	.88	[–.35, .16]
MCS–						
GSI	–.65	.01	[–.84, –.31]	–.65	<.001	[–.78, –.47]
CEQ-F	–.27	.91	[–.62, .14]	–.16	.70	[–.40, .10]
GSI–						
CEQ-F	.39	.50	[–.04, .70]	.30	.12	[.05, .52]

Note. The reported p -values have been adjusted for multiple comparisons using Holm's method (Holm, 1979).

^aFor the value of r .

Neuropsychological results

Means, standard deviations, mean changes (with 95% confidence intervals), and effect sizes for RBANS index scores on intake versus treatment are shown in Table 6.15. Due to the very small sample size, Hedges' g was used as a corrective for Cohen's d (Hedges, 1981). EI calculations found that none of the 16 test

administrations carried the “suspicious” score of ≥ 3 (Silverberg et al., 2007). One intake test administration scored an EI of 1 (the recommended cut-off for potential lack of effort), although that patient had expressed some discomfort about his poor memory performance, and I believed that a genuine effort was made. The follow-up test administration for the patient scored an EI of 0, with improved performance across all indices except Visuospatial.

For the group ($N = 8$), significant differences on a paired-samples t test for treatment versus intake scores were found for Total Scale, $t(7) = 3.37$, $p = .01$, as well as for Delayed Memory, $t(7) = 2.73$, $p = .03$. It is also interesting to note the movement of index scores from being generally a standard deviation below the mean (i.e., < 85) on intake, to within a standard deviation during treatment. In the qualitative terminology of the RBANS manual (Randolph, 2012, p. 76), the sample roughly moves from the “low average” category (80–89) to “average” (90–109).

Table 6.15

RBANS: Intake versus treatment

Index	Intake ^a		Treatment ^a		Change	95% CI ^b	g
	M	SD	M	SD			
Total Scale	82.9	12.4	90.2	10.9	7.3*	[2.2, 12.5]	0.60
I. Memory	84.6	13.8	89.9	16.1	5.3	[−0.5, 11.0]	0.33
Visuospatial	83.8	11.4	86.1	11.9	2.3	[−4.9, 9.7]	0.19
Language	96.1	7.3	101.8	7.7	5.7	[−3.8, 15.0]	0.71
Attention	88.0	18.5	92.8	13.4	4.8	[−1.6, 11.1]	0.28
D. Memory	82.9	15.4	94.5	8.6	11.6*	[1.6, 21.7]	0.88

^a $N = 8$. ^bFor the mean change from intake to treatment.* $p < .05$.

6.3 Discussion

The principal hypothesis (i.e., that of uniform change over time) was supported, with consistently positive clinical change being visible across all measures. The secondary hypothesis, that stress and craving would be linked, was also supported. Indeed, higher stress was related to worse outcomes on all measures, although stress and craving showed an interesting deviation in that the relationship was attenuated during treatment.

Interpretation of major findings

In general, Takiwasi patients are grappling not only with addiction, but with some form of psychological distress. Upon arrival, the average inpatient is highly

stressed, dealing with significant levels of craving and drug use, in a state of poor mental and emotional health (with possibly worse than average physical health), embroiled in social and familial problems, and unsurprisingly is struggling to find meaning and purpose in life. While this does not characterize all patients, at the outset it is more likely to be the case than not.

From a difficult starting point, Takiwasi patients are exposed to an arduous treatment, as outlined in chapter 5. Yet despite months of consuming a variety of scientifically unstudied medicinal and psychoactive plants, no indications of health deficits over the course of time were found. On the contrary, perceived levels of stress, spiritual well-being, mental and emotional health, perceived physical health, as well as neuropsychological performance were generally improved during treatment. Even if these improvements were not caused by the ingestion of plants, the plants themselves do not appear to carry deleterious psychological effects, at least in the way that they are used within Takiwasi. This is an especially important point, as these results that cannot be generalized beyond the context in which the measurements were taken. Of course, the plants utilized in Takiwasi are not entirely “unstudied”, since indigenous and mestizo healers have used a cornucopia of plants over long periods of time, and these traditions are a source of knowledge for Takiwasi (Jauregui et al., 2011; Sanz-Biset et al., 2008).

When examining the relationships of the mixed-effects models to the normative groups, quite consistent trends emerge despite the predominant application of United States norms. In nearly every model, Takiwasi patients are predicted to enter treatment far from clinically positive norms (or close to clinically negative norms). Over the course of treatment, the trends are to move towards a positive norm, or away from a negative one (i.e., in clinically favourable direction). Only the RWB model shows the possibility of a reversing trend. This may appear somewhat surprising given Takiwasi’s Christian orientation, but in fact the model accords well with my own observations: That is, the religious aspects appeal to some patients, but not to others (see also the religious demographics in Table 6.1). The RWB model may demonstrate the division between those patients, particularly in the social reintegration phase of treatment (O_4 – O_5). Yet in either case increased purpose and meaning in life is likely, which is expressed in the EWB model (reaching up to the levels found within United States religious groups). Recalling that EWB items do not deal with theistic questions but rather existential ones, the implication then is that Takiwasi can be beneficial even for patients that reject Christianity and its tenets (or religion in general).

As the methodology employed in the psychological part did not allow for causal attributions to specific parts of the treatment (or even the treatment itself), it is difficult, at least based on the psychological data alone, to state with certainty what the causal agents are. Moreover, given the lack of control group, the most sceptical position on the data is that the treatment provides nothing unique, and that improvements on the tests are simply due to removal from a stressful environment. Firsthand knowledge and experience of the treatment renders this hypothesis unlikely, and as expected, the statistical results are in accordance with

findings from the ayahuasca literature (Barbosa et al., 2009; Barbosa et al., 2012; Bouso et al., 2012; de Lima Osório et al., 2015; Grob et al., 1996; Thomas et al., 2013). Nonetheless, as described in chapter 5, different parts of the treatment were valued depending on the individual, and many patients spoke highly of the dietas. Since the measurement points were anchored to dietas, it may appear that those effects are responsible for the trends. In practice though, measurements were made a full month after, rendering acute dieta effects an unlikely explanation.

Based on the PSS-10 model (see Figure 6.7 and Table 6.4), it can be seen that there are high levels of stress on intake, levelling to somewhere around the United States population average (S. Cohen & Janicki-Deverts, 2012) during treatment. Clearly there is some amount of stress present for the patients in treatment (which is expected), although it is likely that patients are becoming more adept at managing it, rather than simply being removed from all environmental stressors. Partial support for this hypothesis is found in the inter-test correlations reported in Table 6.14. Perceived stress is uniformly associated with psychological outcomes both before and during treatment; for example with PSS-10 scores sharing 62% of variance with MCS scores. The only exception is for stress and craving during treatment, suggesting that some patients may be making progress in dealing with stressors that might have once triggered craving.

The possibility of building some resistance to stress is a good fit with the way patients tend to speak about the treatment programme. It is often characterized as a sort of “training” where the patients prepare for their chance to face the world again; the chance to test their ability to construct a better life. One patient described it in that way: “It’s like a game of football. Here it’s practice, but outside is going to be the official match”. In fact, the Takiwasi staff also echo such sentiments, with Jacques Mabit calling Takiwasi more of a “life school” than strictly a treatment centre. So while it is obvious that inpatients are sheltered to a great extent from the usual responsibilities of life, this reality is not necessarily lost on the patients (nor the staff), although a genuine test of how any therapeutic effects might carry over into post-treatment life would require long-term follow-up data.

Limitations and future directions

One conspicuous aspect of the data is the steadily decreasing sample size from intake to exit. While this might imply a selection bias where only those that benefit from treatment remain in the study, it seems improbable as the most measurable benefits are gained in the first few months of treatment (i.e., O_1-O_2). The Takiwasi claim that many patients feel immediately cured after a number of ayahuasca sessions (and subsequently wish to leave) seems to better accord with the data.

On the other hand, given the nature of the treatment, it is more remarkable that any patients would stay for the full term at all. As mentioned, the programme is extremely difficult to endure, particularly with respect to the constant physical

purging, arduous mental journeys, and consistent denial of basic life pleasures. However, the plants' effects do tend to engender a kind of resolve towards persevering in the face of difficulty. Yet months of nearly continuous effort is often too much, and treatment fatigue combined with the desire to live in society again are the primary reasons for treatment exit, rather than a lack of perceived benefit. Very early exits may involve different reasons however, for example shock at the nature of the treatment and realization of the difficulty involved. Nonetheless, these seem to be limitations of the treatment itself rather than the study.

With respect to patient intake, Takiwasi has an advantage in that they only accept patients who have already committed to change. Takiwasi patients are never forced by state agencies to attend, therefore it might be argued that these particularly dedicated patients would gain equal benefit from any other treatment modality (Prochaska & Velicer, 1997). While this may be true, it is common for Takiwasi patients to have previously tried other treatment methods without lasting success. Moreover, a commitment to change is simply a prerequisite for treatment in Takiwasi; the methods could not (or should not) be applied without consent or personal motivation. So while there is a limitation in the form of a selection bias for the kinds of patients that Takiwasi will accept, it is once again inherent to the treatment and is therefore unavoidable. At the same time, the bias does pose a potential problem for cross-treatment comparisons, and also suggests that Takiwasi may only be suitable for a certain subset of those with addiction problems.

Regarding future directions, personality testing seems to be an interesting avenue of enquiry, and was only ruled out in the present study due to the associated increase in participant test burden. Other measurement possibilities aside, undoubtedly the most useful future direction would be a study replication with the inclusion of a control group and the collection of long-term follow-up data (including addiction severity status). The addition of a control group from an established residential treatment facility would advance the possibility of cross-treatment comparison, while long-term follow-up data would help to substantiate claims of Takiwasi's treatment effectiveness (J. Mabit, 2002; Tucker & Roth, 2006).

Conclusion

The application of quantitative psychological measures has provided likely indications of a clinically positive treatment effect in patients with serious addictions. At the very least, it has contributed strong evidence against deleterious psychological effects of the treatment as a whole (beyond the use of ayahuasca alone). It is important to remember however, that this particular methodology generates very little information about what the treatment actually is, and indeed says nothing at all about the conditions that might be important for safe and effective use. Bishop's (2009) critique of the general process of psychological operationalization and measurement is especially relevant:

Thus, “what” is seen in the process of conceptualization and operationalization is what the researcher has constructed the test to see. “What” is seen is less about “what” is there, but is itself only seen as the result of the particular process of definition through conceptualization, operationalization, and testing. [...] [The quantitative psychological study] as a whole is less about what the actual participants in the community or society are actually doing or what they believe, and it is more about the original reason the human scientists are asking the question to begin with. (p. 269)

In the present case, quantitative testing was utilized for a more objective measurement of within-treatment effects. The psychological measures have provided that in part—and nothing more. Such a methodology applied in isolation at Takiwasi would give a dangerously barren account of the treatment, hence this chapter must remain a component of a larger biopsychosocial design.

Biological Changes Within Treatment

Synopsis In chapter 2 the relationship between stress and addiction was outlined, along with the functioning of the HPA-axis—a major biological component implicated in the stress response. Given the hypotheses: (a) that stress and addiction are related, and (b) that the Takiwasi treatment for addiction carries a therapeutic effect; it logically follows that biological changes in HPA-axis functioning should be occurring for patients undergoing treatment. Indeed, this must be the case if both hypotheses are true. Therefore in this chapter the rationale, methods, and results of investigation into patient HPA-axis functioning are presented, along with discussion on the meaning of those results within the broader context of the study.

To briefly review the physiological relationship put forward in chapter 2 (for a review, see Cleck & Blendy, 2008): The repeated abuse of drugs induces dysregulation in the stress circuitry via allostatic between-system adaptations (George et al., 2012; Koob & Le Moal, 2001). These changes occur in addition to within-system adaptations in the more well-known mesolimbic dopamine “reward pathway”. The final stage of the HPA-axis cascade is the production of glucocorticoids (cortisol in humans), and thus the measurement of cortisol can determine HPA-axis activity and potentially track biological change in the stress system over time. Yet even though cortisol has been put forward as a plausible biomarker of addiction and recovery (Dodge et al., 2010), considerable difficulty remains in disentangling precisely what changes in cortisol levels might mean within a treatment setting.

From the perspective of measuring salivary cortisol (one of the least invasive methods of sample collection) within a substance abuse population, there are a number of factors which render the interpretation of HPA-axis activity problematic. To begin with, even though the usual diurnal pattern of morning rise and evening drop in cortisol production is expected (Sherman, Wysham, & Pfohl, 1985), flattened and irregular cycles do exist in the population (Smyth et al., 1997; Stone et al., 2001). The implications of such patterns remain unknown,

but the fact that individual differences are present in the population is important to note.

Regarding addiction patients, it is well-known that most drugs of abuse stimulate cortisol production acutely, and the withdrawal syndrome is likewise characterized by increases in cortisol (Adinoff, Ruether, Krebaum, Iranmanesh, & Williams, 2003; Bunce et al., 2015; Shi et al., 2009; Zhang et al., 2008). Patients undergoing treatment have shown generally elevated cortisol levels (H. C. Fox et al., 2009), although such effects appear to normalize over time (Bunce et al., 2015; Cleck & Blendy, 2008; Contoreggi et al., 2003). However, greater withdrawal symptom severity is associated with worse treatment outcomes, even beyond the acute withdrawal stage (Sinha, 2011).

Dysregulation in the stress response persists post-withdrawal, and can be used to predict relapse, although there have been varied results in terms of actual HPA-axis functioning (Sinha, 2011). For example, greater stress responses to craving predicted worse treatment outcomes for alcoholics (Higley et al., 2011), yet in the same sample higher stress was in fact associated with a blunted cortisol response (and see Lovallo, 2006; Lovallo, Dickensheets, Myers, Thomas, & Nixon, 2000). On the other hand, Daughters, Richards, Gorka, and Sinha (2009) reported that although blunted cortisol responses to stress were found in a sample of residential treatment patients, higher cortisol responses to stress were predictive of treatment dropout. To make matters more ambiguous, Sinha et al. (2006) found that while an increased stress response did predict time to relapse (in cocaine abusers), the level of cortisol produced did not (although it did predict the amount of cocaine used). Thus it seems likely that there are differential effects across substances (and possibly individuals), and therefore the common phenomenon of polysubstance abuse may produce unexpected HPA-axis results.

In addition to drug-related effects (which likely also include HPA-axis alterations connected to memory and emotional processing; Gerra et al., 2003; Zhao et al., 2010), the correlations between mental illness and HPA-axis functioning need to be taken into account (especially so within addiction populations; Grant et al., 2004; Harris & Edlund, 2005; Jacobsen, Southwick, & Kosten, 2001). Reviews in the mental health literature with regard to HPA-axis functioning tend to parallel findings within the addiction literature: That is, that HPA dysregulation commonly occurs along with mental illness, although in different forms depending on the diagnosis (and even clinical subtype; Baumeister, Lightman, & Pariante, 2014). For example, depressed patients tend to show elevations across various cortisol measures (although it may depend on the type of depression; Yehuda, Teicher, Trestman, Levengood, & Siever, 1996), whereas posttraumatic stress disorder and other anxiety disorder patients show mixed responses (Baumeister, Lightman, & Pariante, 2014; Elnazer & Baldwin, 2014; Meewisse, Reitsma, De Vries, Gersons, & Olff, 2007). Psychotic patients may show a blunted cortisol awakening response, but have elevated daily cortisol levels (Baumeister, Lightman, & Pariante, 2014).

Although these HPA-axis patterns may not always be causally related to

mental illness (e.g., in some cases they might reveal pre-existing risk factors), they do contribute to an interpretative problem in a real-world treatment setting where instances of concomitant mental illness are high. That said, it does seem likely that extreme deviations in cortisol production (i.e., either hyperactivity or hypoactivity) are undesirable from a health perspective (Baumeister, Lightman, & Pariante, 2014). Similar findings with respect to learning have been found, with stress-induced cortisol increases leading to improved memory performance for healthy controls, but worse performance for cocaine dependent patients (most likely due to their higher basal cortisol levels, H. C. Fox et al., 2009; and see de Kloet, Oitzl, and Joëls, 1999; Het, Ramlow, and Wolf, 2005). Finally, in a meta-analysis of the psychosocial correlates of morning cortisol (the awakening response), an increasing response was associated with general life stress, whereas decreases were correlated with fatigue and exhaustion (Chida & Steptoe, 2009); once again suggesting that extreme variations in HPA-axis functioning are undesirable.

Hypotheses

Given the prevalence of poor mental health and polysubstance abuse for Takiwasi patients on intake (see Tables 6.3, 6.2, and 6.1), it is difficult to predict the direction of changes in HPA-axis functioning (even assuming a positive treatment effect), although it was expected that changes in diurnal cortisol production would be found. However, in the absence of an established addiction biomarker, the measurement of cortisol must function in an exploratory manner, since the causal pathways are not yet fully understood.

7.1 Method

Design

The study design for the biological component was comparable to that discussed in the method section of chapter 6 (along with similarly associated design considerations). The primary difference was that the biological measurements were not made according to any treatment-related schedule (as with the psychological measures), but rather were obtained roughly once a month. The ideal situation would have been that the biological measurements occurred in conjunction with the psychological measurements; however, this proved to be logistically infeasible. One further difference was that sampling days consisted of three cortisol measurements per patient, which were then aggregated to measure various aspects of the diurnal cortisol rhythm.

Participants

The number of patients who provided cortisol samples was 22, from whom a total of 77 sample sets were collected. For clarity, a *sample* is defined here as one individual cortisol measurement, whereas a *set* refers to a collection of three samples from one patient on one day (i.e., two morning samples and one evening sample). Of the original 77 sets, 15 were removed from analysis due to sampling violations (or other logistical problems), leaving 62 sets in total. With three measurements per set, there were 186 viable cortisol samples in total. Because the biological data collection was delayed by a number of months¹ when compared with the psychological data collection, the 22 patients who provided samples were only a subset of those patients who provided psychological data ($N = 36$; see chapter 6).

For the biological sample (where $N = 22$), ages on treatment admission ranged from 20–50 ($M = 29$, $SD = 7$), and total time in treatment (from entry to exit) ranged from 5–367 days ($M = 212$, $SD = 107$). Further demographic information on the sample can be inferred from Table 6.1.

Measures

The sole measure applied was the collection of saliva via the oral swab method (i.e., with an absorbent device placed in the mouth) for the purpose of obtaining salivary cortisol. The Salimetrics² “SalivaBio Oral Swab”³ was used for saliva collection, and the swabs were stored in Salimetrics plastic “Swab Storage Tubes”⁴ (which are designed for easy saliva collection after the swab is centrifuged).

Procedure

On sampling days, all patients who had consented to biological data collection provided saliva samples. The sampling days were selected roughly every month, and the main concern was to minimize short-term interference from therapeutic interventions (such as ayahuasca sessions). Therefore sampling generally took place on a Saturday or Sunday (when therapeutic activities in Takiwasi are minimal). Saliva was never collected the day after an especially strong intervention, such as an ayahuasca or purgahuasca session.

Prior to the very first sample collection session, a meeting was held with the patients and a senior Takiwasi staff member. The rationale was to further inform the patients about the purpose of collecting scientific data, and to ensure that all patients understood the nature and rules of the sample collection process. As a reminder on sampling days, basic graphical depictions of the sampling protocol

¹Due to equipment import difficulties with Peruvian customs.

²<http://www.salimetrics.com/>

³Part number 5001.02.

⁴Part number 5001.05.

were made visible in the patients' quarters. The precise procedure, with associated rules, was as follows:

- 06:15 Patients were awoken (by a bell which is rung every morning) and provided with water to rinse their mouths.
- 06:20 The first swab (S1) was placed under the tongue for 2 minutes (while the patient was awake but still in bed). After this, the patients could rise and shower if desired, but tooth brushing, eating, or exercise were not permitted.
- 06:45 The second swab (S2) was placed under the tongue for 2 minutes. After this the patients were free until the evening, with no special restrictions.
- 20:45 From this point (i.e., one hour before the final sample) tooth brushing, eating, or exercise were not permitted.
- 21:45 Patients rinsed their mouths with water.
- 21:50 The third swab (S3) was placed under the tongue for 2 minutes. By this time, the patients were preparing for sleep.

Thus a forced awakening method was employed (Stalder et al., 2016), although this condition was not introduced by the study since the timing of sample collection was based on the patients' pre-existing sleep schedule. The 30-minute delay between S1 and S2 was intended as a basic measure of the cortisol awakening response, with S3 completing a minimal estimation of the diurnal rhythm (Adam & Kumari, 2009). After sample collection, the tubes were stored in a newly purchased consumer-grade freezer. The samples were later transported by air (packed in dry ice) from Tarapoto to Lima for storage at -80°C , prior to their subsequent analysis.

Analyses

Laboratory

The determination of sample cortisol levels was carried out at Cayetano Heredia University in Lima, Peru. Salimetrics "Salivary Cortisol ELISA Kits"⁵ were used with the analyses done in duplicate (with reported sensitivity of the assay kit being $<0.007\text{ }\mu\text{g/dL}$). The laboratory technician was blind to the meaning of the numbering system used for sample labelling, which consisted simply of two integers; box number and sample number. Information linking specific patients to samples was maintained separately.

⁵Catalogue number 1-3002-5.

Cortisol measures

Total diurnal cortisol (area under the curve) The measurement of three samples over the course of a day produces three separate cortisol values, which can be plotted to produce a visual estimation of the diurnal cortisol secretion pattern. For the purposes of analysis however, it is desirable to work on a single value. The area under the curve with respect to ground (AUC_g; Pruessner, Kirschbaum, Meinlschmid, & Hellhammer, 2003) provides a summary value of the average cortisol exposure for the day. The formula used for its calculation (Fekedulegn et al., 2007; Pruessner et al., 2003) is as follows:

$$\sum_{i=1}^{n-1} \frac{(m_{i+1} + m_i)t_i}{2}$$

where n denotes the number of samples (in this case, three), i a given sample point, m_i the measured cortisol level for a given sample point, and t_i the time elapsed between sample i and sample $i + 1$. For only three samples, the formula calculates the area under the curve for two polygons; that between S1 and S2, and that between S2 and S3 (for a visual reference, see the diurnal patterns in Figure 7.2). These two polygons are then summed, which produces the AUC_g.

Cortisol awakening response (CAR) The CAR is an important part of the diurnal rhythm that has been associated with a range of biological and psychological variables (Chida & Steptoe, 2009), although the meaning across situations and individuals has proved difficult to establish (Stalder et al., 2016). The CAR functions in a way that is distinct from cortisol reactivity to stress, and also appears to be unrelated to the earlier and later parts of the diurnal rhythm (i.e., it is specifically a response to awakening; Stalder et al., 2016). It is therefore likely to be a distinct measure when compared with total daily cortisol production. Nonetheless, extreme values (either elevated or blunted) have been associated with negative health outcomes (Adam & Kumari, 2009).

When more than two points in the awakening response have been sampled (which is ideal; Stalder et al., 2016), the CAR is most accurately defined as the area under the curve with respect to increase (AUC_i; Pruessner et al., 2003). However, in the current data set only two points were measured during awakening, and an analysis of the slope (from S1 to S2) produced identical results to an AUC_i analysis. The CAR is defined here as the regression slope from S1 to S2.

Diurnal slope The diurnal slope represents the rate of change in cortisol produced from the early morning to the late evening. Since the CAR is a distinct part of the diurnal cycle, it seems most sensible to measure the diurnal slope from the very first sample (rather than from the CAR peak). Therefore the diurnal slope is defined here as the regression slope from S1 to S3. According to Adam and Kumari (2009), a steeper decline in the diurnal slope has been associated with

better physical and mental health outcomes. In particular, an elevated evening sample may be indicative of chronic stress (S. Cohen et al., 2006).

Statistical analysis

Modelling patient change When testing for change over time on AUC_g , CAR slope, or diurnal slope, mixed-effects models were used in much the same way as in chapter 6. Once again, to account for the violation of statistical independence due to repeated measures, the random-effect in every model is the patient. The fixed-effect is always the continuous “days in treatment”. All the models are random intercept only, with none featuring both random slope and random intercept. The omission of a random slope implies the modelling assumption that there is one constant underlying effect for all patients: In other words, that the effect of treatment (or time spent in Takiwasi) on the diurnal cortisol rhythm is invariant across patients. As will be seen with respect to cortisol, this is clearly an undesirable assumption, but there was little choice due to the lack of available data (i.e., there are insufficient samples for model convergence with random slope and random intercept).

Software All analyses were conducted using R (R Core Team, 2017). Plots were generated using *ggplot2* (Wickham, 2009), and mixed-effects models were calculated with *lme4* (using the default “profile” method from *confint.merMod* for confidence intervals; Bates et al., 2015). Model summary statistics relied on *lmerTest* (Kuznetsova et al., 2016), and model effects for plotting were extracted with *effects* (J. Fox, 2003).

7.2 Results

The results of the cortisol analyses are broken up into five parts: (a) an analysis of sample integrity, (b) descriptive statistics concerning the diurnal cortisol patterns, (c) an analysis of AUC_g over time, (d) an analysis of CAR over time, and finally (e) an analysis of diurnal slope over time.

Sample and data integrity

Although cortisol is a remarkably stable analyte (Kirschbaum & Hellhammer, 1994), it was important to screen the data for degradation over time as the samples were stored for up to six months in a consumer-grade freezer (prior to storage in laboratory conditions). If older samples had on the whole degraded relative to the more recent samples, then an upwards trend over time would be expected for cortisol levels. However, no such trend is found in Figure 7.1, which shows cortisol levels by sample date (i.e., completely ignoring patients and their time in treatment). Even with the removal of early outlier samples, a regression of

total sample age (in days) against sample cortisol level showed a minor and non-significant trend towards higher cortisol levels for older samples, $R^2 = .01$, $F(1, 184) = 2.09$, $p = .15$.

The outlier values removed from the regression (six samples in total) are highlighted in the first column of Figure 7.1 (as triangles), and they were also discarded from subsequent analyses. This decision was based on the outliers' overly strong influence on modelling outcomes. More specifically, their inclusion created statistically significant effects which were in fact non-significant once the outliers were removed from the data set. One outlier in particular had a very strong effect on the models, since it occurred late in the patient's treatment and thus heavily affected the modelling of time-based changes.

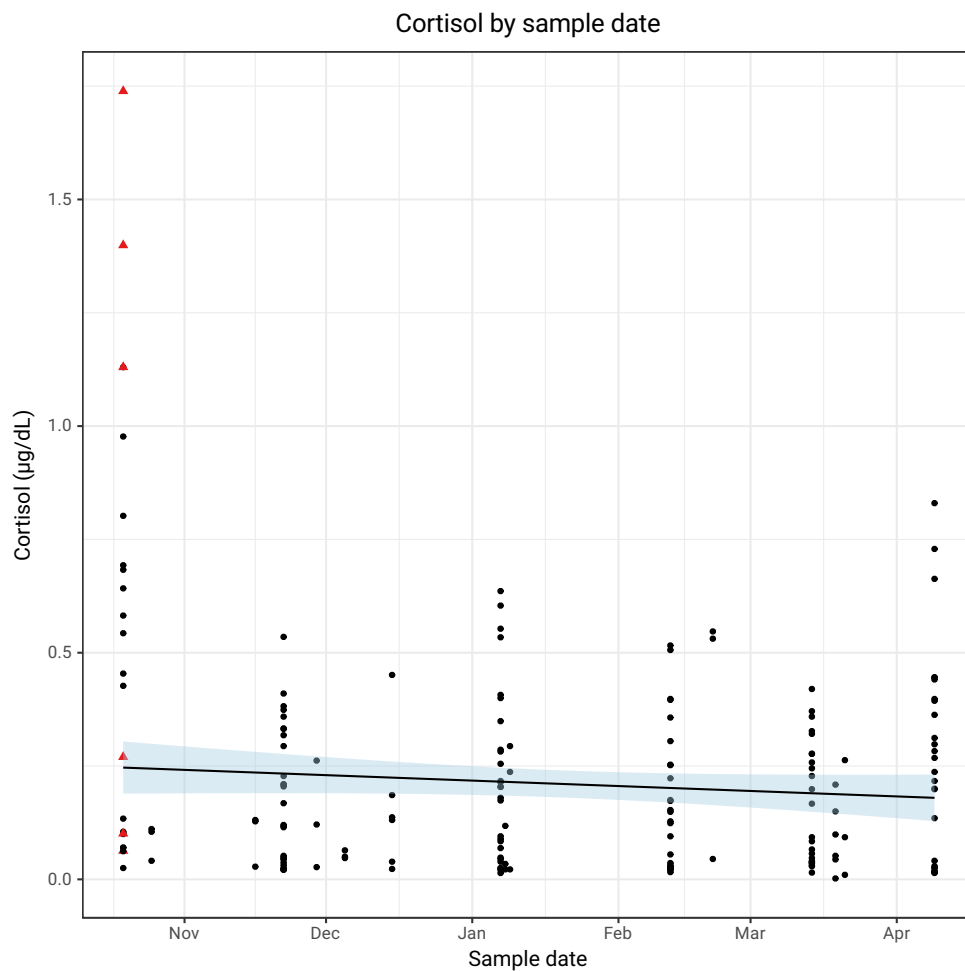


Figure 7.1
Cortisol levels by sampling date

Diurnal cortisol patterns

The most basic point of analysis is the inspection of patient diurnal cortisol rhythms, which requires an examination of the central tendency and dispersion of the cortisol data at the three measurement points (i.e., collapsed across sampling days). Figure 7.2 shows the mean cortisol (± 1 *SD*) for each sampling point (S1, S2, and S3; $N = 62$ sets, with 186 samples total). The data are further grouped depending on the CAR style; being either upwards ($n = 33$ sets, with 99 samples total), downwards ($n = 23$ sets, with 69 samples total), or flat ($n = 6$ sets, with 18 samples total).

From Figure 7.2 it can be seen that the primary sources of variability in the data are located at S1 and S2. While a range of CAR types are present, the lack of variability at S3 (the evening samples) and the generally expected decrease towards low evening cortisol values provide confidence in the conditions of the physical sample storage and also in the biological analysis technique. As would be expected, the diurnal slope (i.e., the regression slope from S1 to S3) is negative for nearly all sets, ranging from -0.06 to 0.00 ($M = -0.02$, $SD = 0.01$). This suggests that variability in the data is not randomly spread across sampling points, and also that the data are consistent with an overall expected diurnal cortisol progression (despite CAR variation). Therefore the variations found at S1 or S2 are due either to genuine biological differences across patients, within-patient biological change over time, or simply to timing errors in the morning sampling (as the awakening period is known to be particularly time-sensitive; Stalder et al., 2016).

Although a certain amount of timing error must be present, there are a number of reasons why it seems likely that some measure of biological difference (or change) is additionally being reflected. Firstly, Takiwasi patients are obliged to rise at the same time every morning (which somewhat ameliorates the difficulties associated with awakening time variation), and on sampling days I roused the patients at their usual hour and timed the administration of cortisol swabs myself. Moreover, while flat or negative CAR slopes may indeed be indicative of inaccurate sample timing, they may also be representative of pre-existing individual differences, or of HPA-axis dysregulation. Given the addiction treatment context, it would not be altogether surprising to see dysregulation in the HPA-axis and the diurnal cortisol pattern. Still, the possibility of sampling errors (e.g., where patients had in fact woken earlier than S1) creating abnormal CAR patterns cannot be ruled out, as no objective measure of wake-up time was used during sample collection.

Figure 7.3 shows the diurnal cortisol patterns for every set, grouped by patient and by sampling session. Sampling session represents a rough estimate of when the sample was taken relative to the patient's treatment. The mean days in treatment for sampling sessions 1 through 6 were 23, 69, 115, 182, 216, and 236 days respectively.

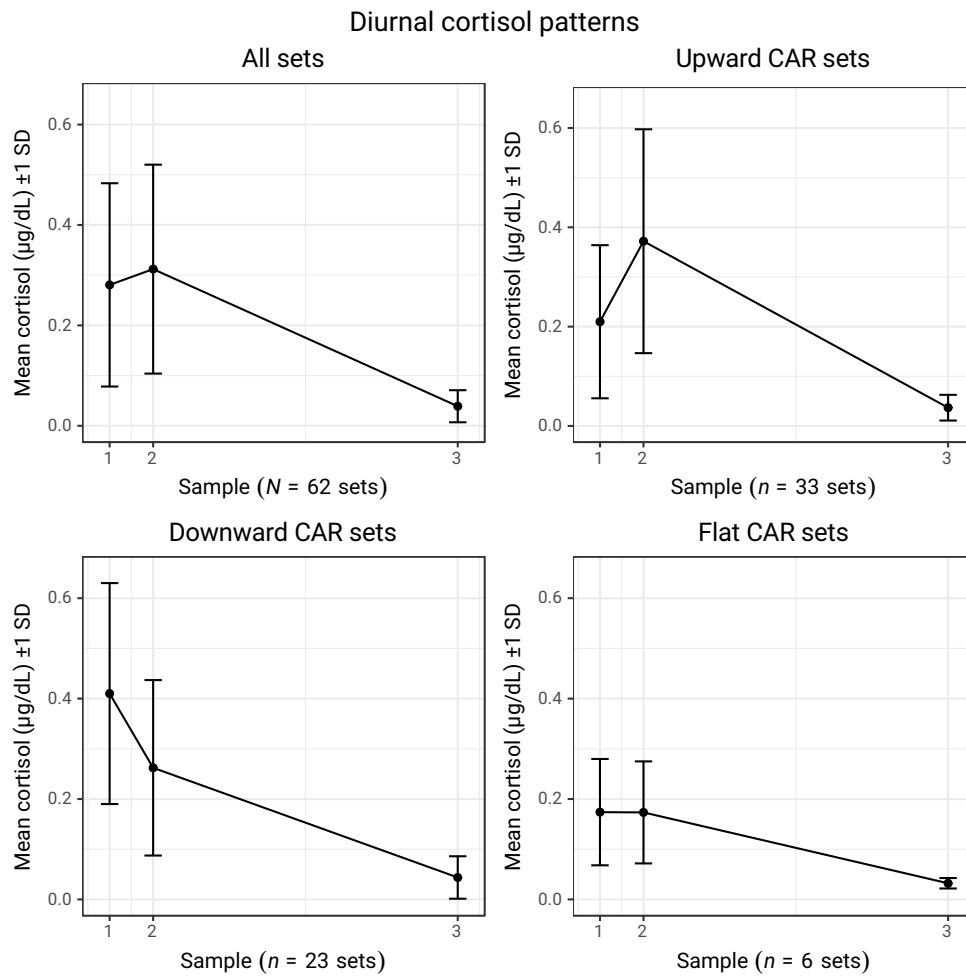


Figure 7.2

Diurnal cortisol patterns: Dispersion and central tendency

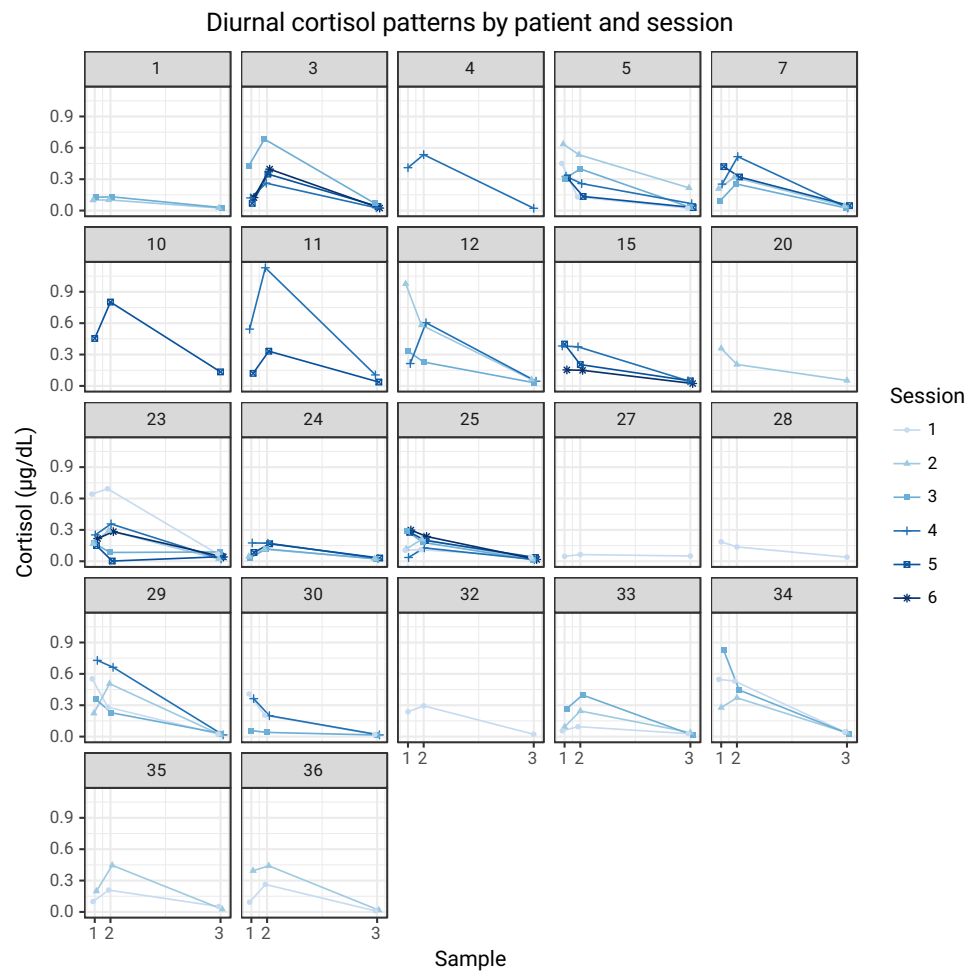


Figure 7.3
Individual diurnal cortisol patterns by sampling session

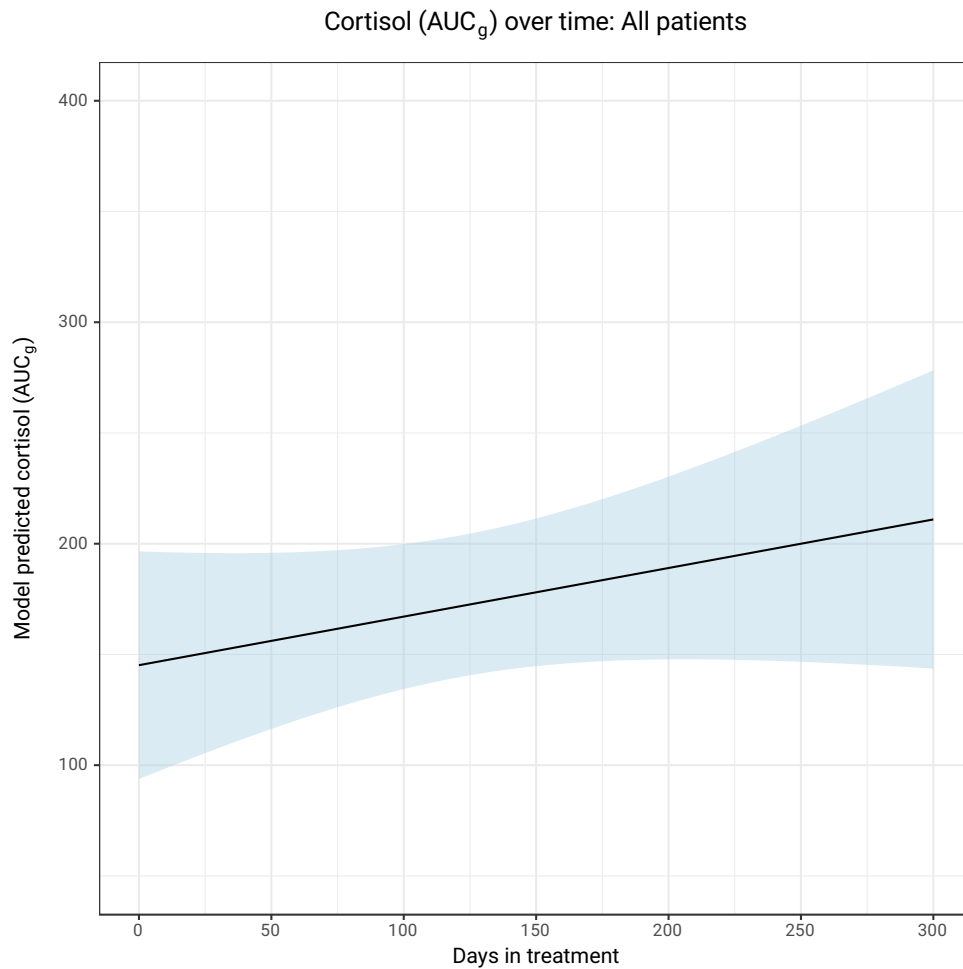
Total diurnal cortisol (AUC_g)

Figure 7.4

Total cortisol (AUC_g) change trend: All patients

Figure 7.4 shows the fixed-effects from a mixed-effects model of AUC_g change by days in treatment at Takiwasi. The model summary statistics for the effect of days in treatment on AUC_g are $t(42.0) = 1.32$, $p = .19$, with an estimated daily AUC_g increase of 0.22, 95% CI $[-0.11, 0.55]$, $SE = 0.17$. The summary statistics with the inclusion of the two outlier cases are $t(62.0) = 2.34$, $p = .02$, with an estimated daily AUC_g increase of 0.48, 95% CI $[0.08, 0.88]$, $SE = 0.20$. However, a significance hinging on the inclusion of two extreme values does not appear to be very trustworthy. At any rate, regardless of whether the model is found to be statistically significant, it seems clear from an examination of individual patient regression lines that one trend (either up or down) will not be a sufficient

explanation of the data. Figure 7.5 demonstrates AUC_g regression lines over days in treatment for each patient.

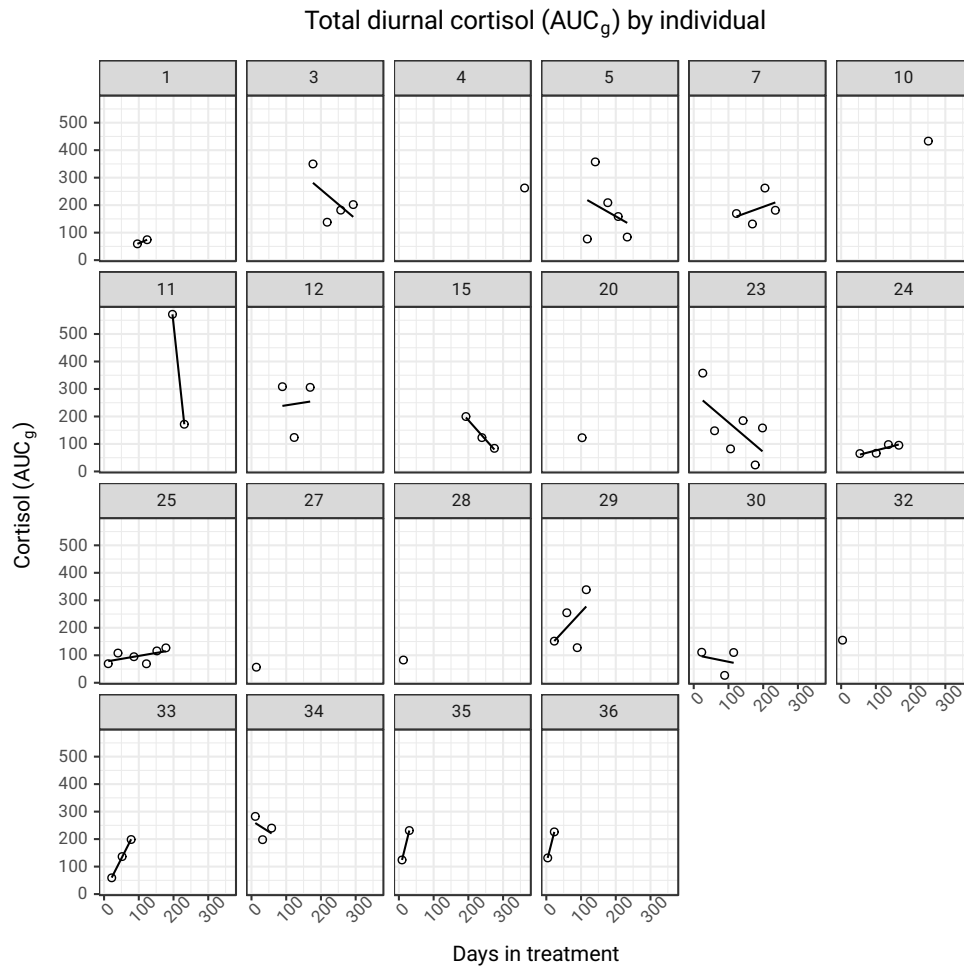


Figure 7.5
Total cortisol (AUC_g) change trend: By individual

In general the data are quite consistent with a change trend, although for some patients that trend is upwards, while for others it is downwards. As the sample sizes were already quite small for the generation of mixed-effects models, the splitting of the sample into AUC_g up and down trending patients was a difficult proposition for modelling. Nevertheless, such groups were created as follows:

- Up: 1, 7, 12, 24, 25, 29, 33, 35, 36
- Down: 3, 5, 11, 15, 23, 30, 34

The summary statistics for the upward group on AUC_g change over time (see Figure 7.6) are $t(28.0) = 1.48$, $p = .15$, with an estimated daily AUC_g increase of 0.35, 95% CI $[-0.14, 0.82]$, $SE = 0.24$. For the downward group (see Figure 7.7) the statistics are $t(13.6) = -1.25$, $p = .23$, with an estimated daily AUC_g decrease of -0.44 , 95% CI $[-0.70, 0.45]$, $SE = 0.35$.

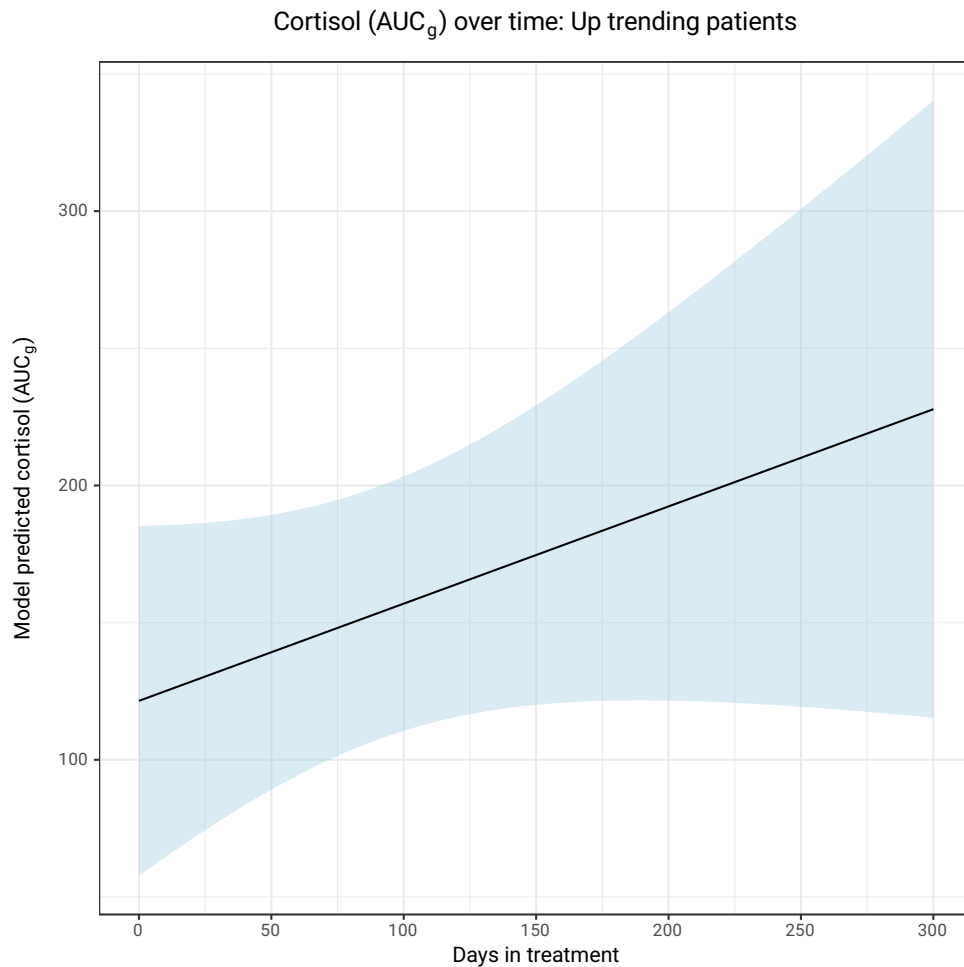


Figure 7.6
Total cortisol (AUC_g) change trend: Upward trends

Figure 7.8 shows the central tendency and dispersion (mean and standard deviation) of the patients' diurnal cortisol patterns when split by AUC_g trend group. There does seem to be some support for the idea that the upwards trending group tend to have lower cortisol levels, while the downwards trending group tend to have higher cortisol levels. Due to the relative lack of variability at S3, it would seem that most of the change in AUC_g should be occurring at S1 and S2, therefore suggesting the CAR as an area of interest.

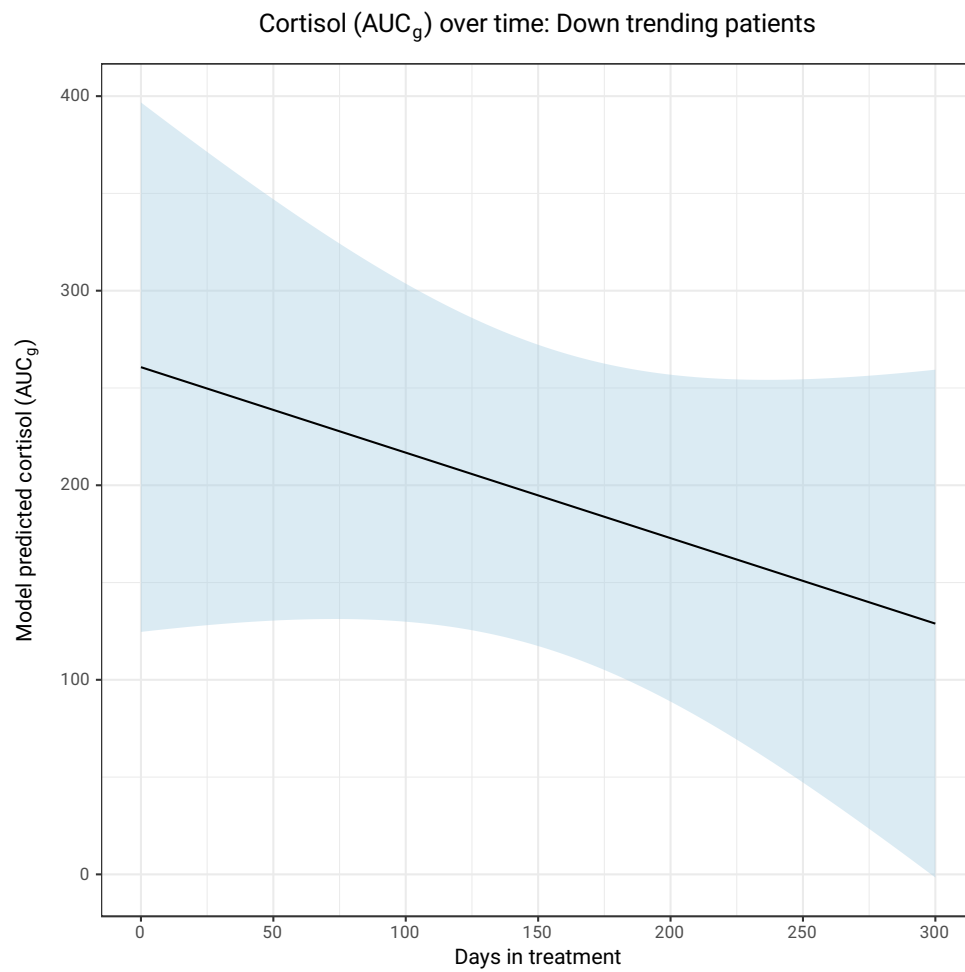


Figure 7.7

Total cortisol (AUC_g) change trend: Downward trends

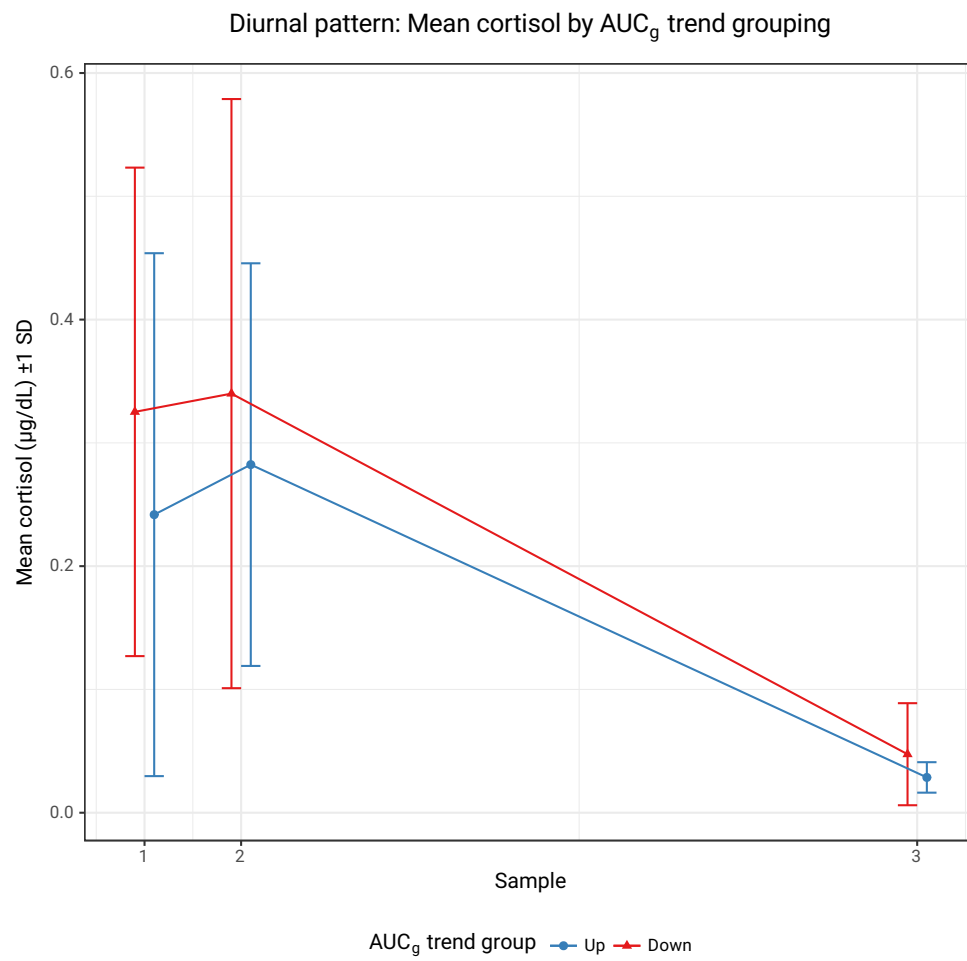


Figure 7.8
Cortisol sample distribution by AUC_g trend group

Cortisol awakening response

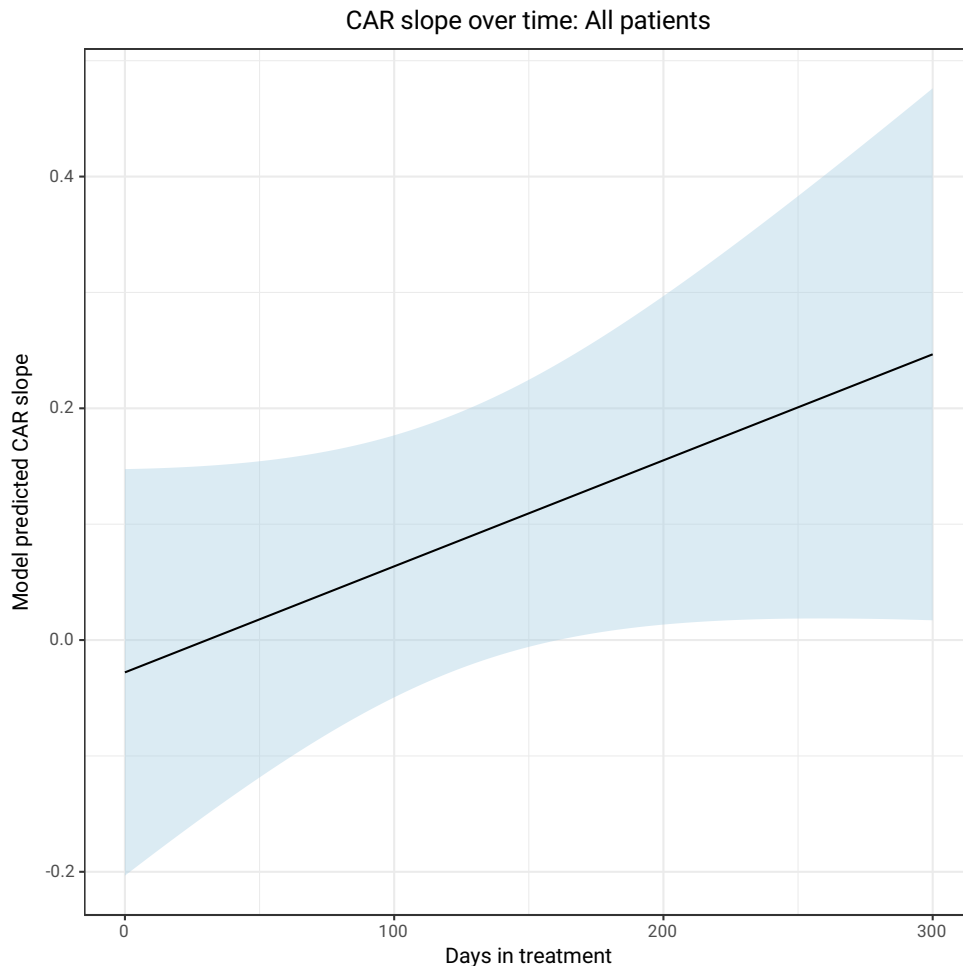


Figure 7.9
Mixed-effects model for CAR slope over time

The fixed-effects (with 95% CI) from a mixed-effects model of CAR slope by days in treatment are shown in Figure 7.9. The summary statistics are $t(44.9) = 1.63$, $p = .11$, with an estimated daily increase in CAR slope of 9.1×10^{-4} , 95% CI $[-1.8 \times 10^{-4}, 20 \times 10^{-4}]$, $SE = 5.6 \times 10^{-4}$. When including the outliers, the summary statistics are $t(35.3) = 2.90$, $p = <.01$, with an estimated daily increase in CAR slope of 19×10^{-4} , 95% CI $[6.4 \times 10^{-4}, 31 \times 10^{-4}]$, $SE = 6.4 \times 10^{-4}$.

Once again it seems more prudent to reject the model that requires outliers for statistical significance. Similar to the AUC_g model, an examination of the individual patient regressions (see Figure 7.10) suggests a dual trend. The splitting of groups based on upwards or downwards CAR trend was therefore made based

on the following groups;

- Up: 3, 5, 12, 29, 30, 33, 35
- Down: 7, 11, 23, 25, 34, 36

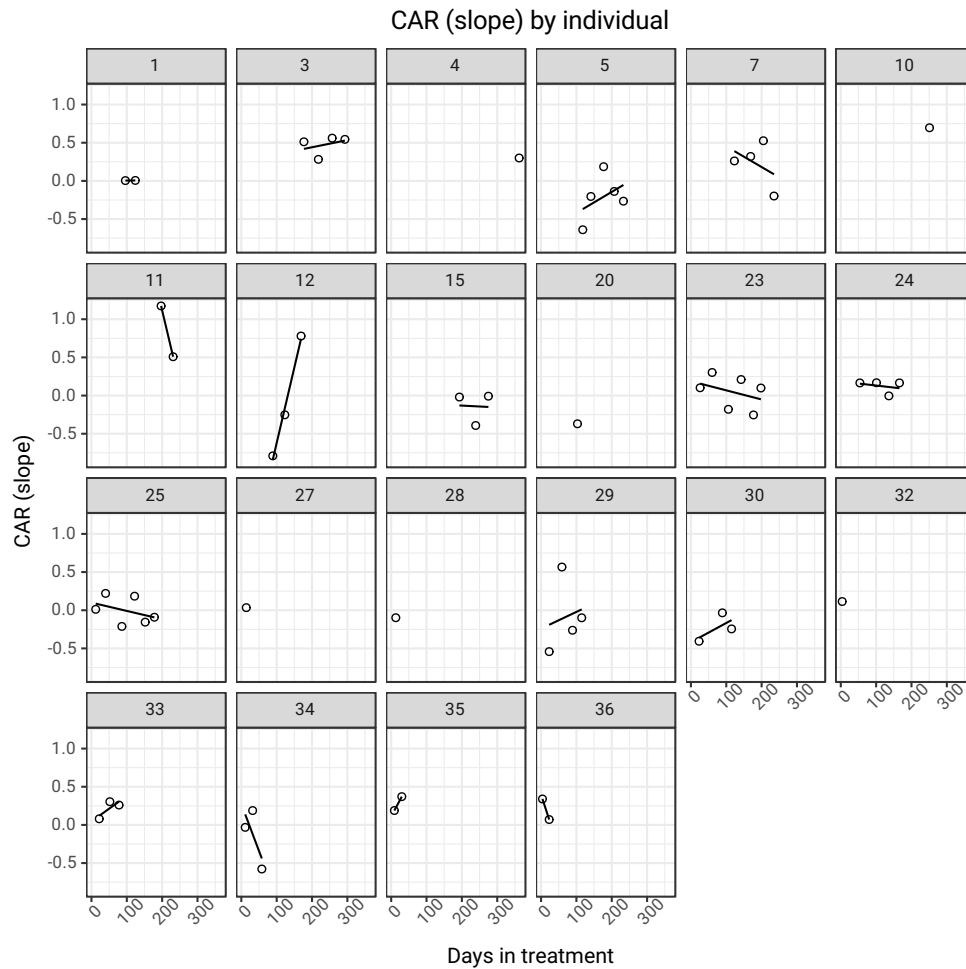


Figure 7.10
Individual CAR slope trends by patient

Mixed-effects modelling based on CAR trend split produced $t(12.0) = 1.59$, $p = .14$ for the upwards group (see Figure 7.11), and an estimated daily increase in CAR slope of 20×10^{-4} , 95% CI $[-5.2 \times 10^{-4}, 46 \times 10^{-4}]$, $SE = 13 \times 10^{-4}$. For the downwards group (see Figure 7.12) $t(21.0) = -0.73$, $p = .47$, with an estimated daily decrease in CAR slope of -7.5×10^{-4} , 95% CI $[-8.7 \times 10^{-4}, 26 \times 10^{-4}]$, $SE = 10 \times 10^{-4}$.

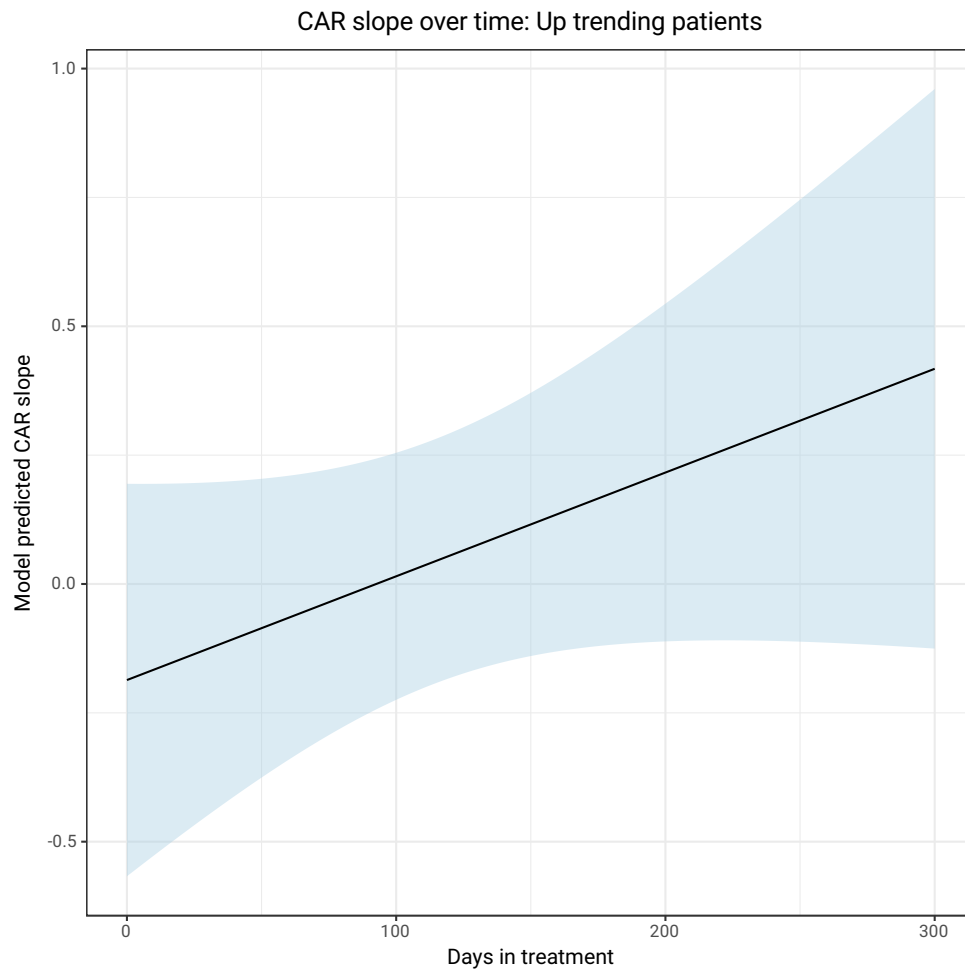


Figure 7.11
Mixed-effects model for CAR slope over time: Upward trends

Unfortunately, the data were already too sparse for model generation prior to group splitting, although the individual trends shown in Figure 7.10 are suggestive of some change. When the mean diurnal cortisol patterns are plotted (see Figure 7.13), there is little evidence for large differences between the two groups, although the patients with a downward trending CAR may have a steeper slope when compared with those who have an upwards trending CAR.

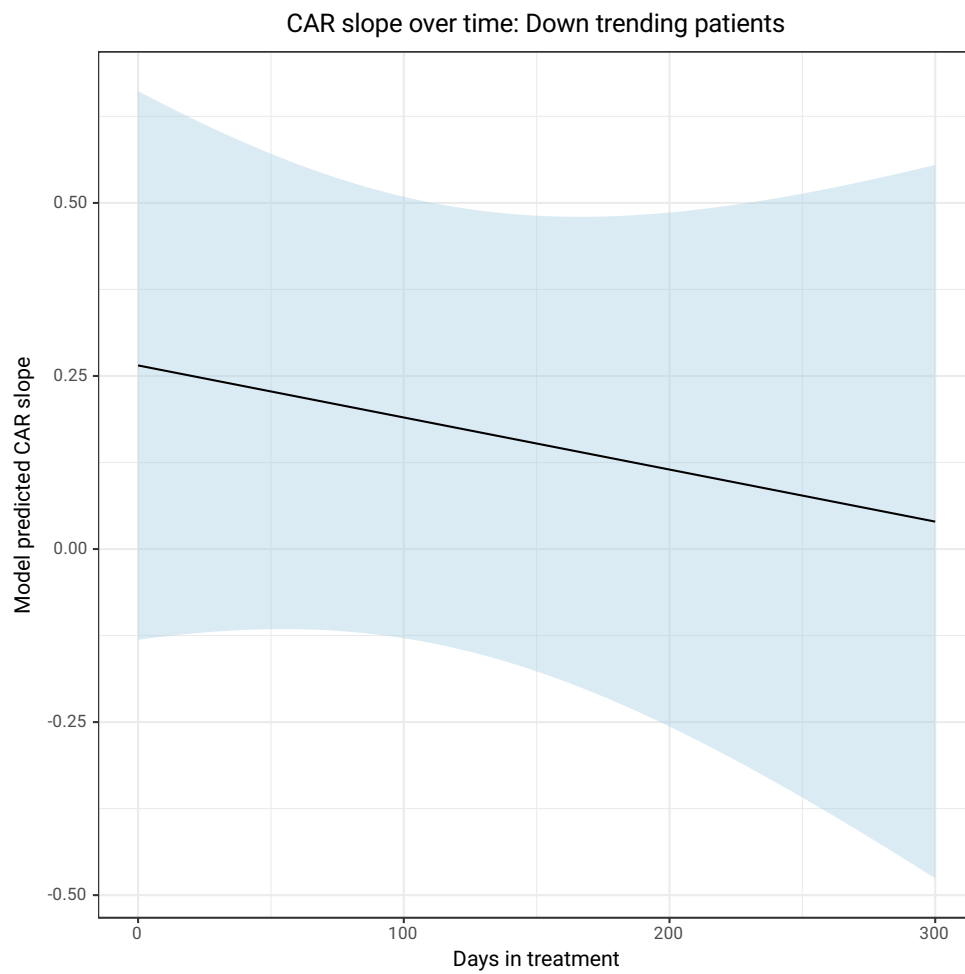


Figure 7.12

Mixed-effects model for CAR slope over time: Downward trends

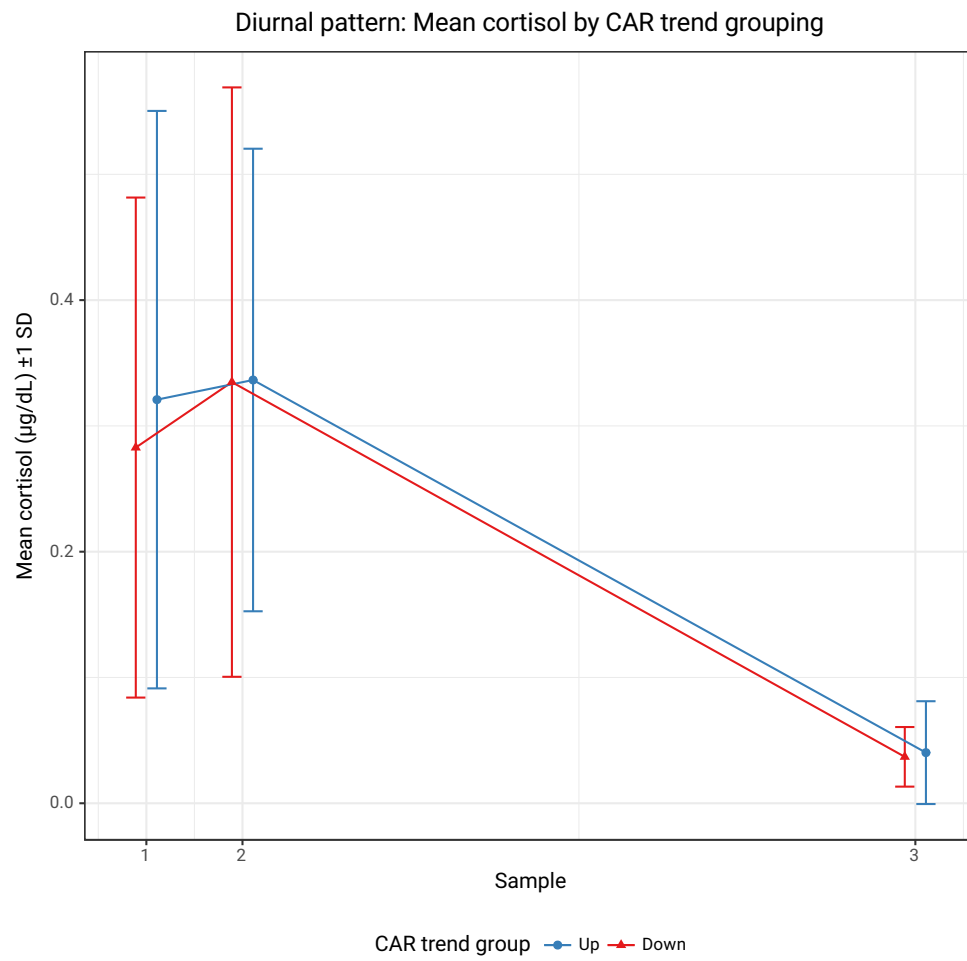


Figure 7.13
Diurnal cortisol by CAR slope trend

Diurnal slope

There was no significant overall trend for a mixed-effects model of diurnal slope by days in treatment, with $t(47.0) = 0.07$, $p = .95$, and a negligible estimated daily increase in diurnal slope. As with the AUC_g and the CAR, plotting the individual patient regressions suggested the presence of two separate trends (see Figure 7.14).

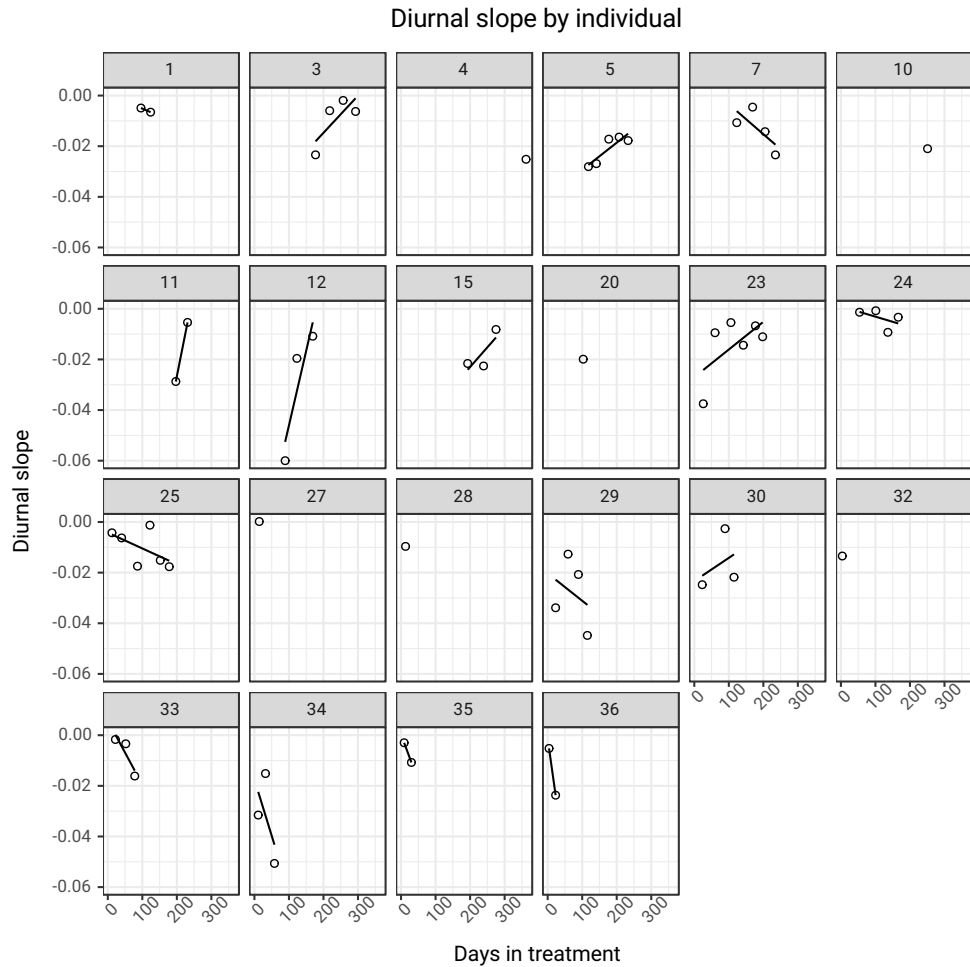


Figure 7.14
Individual diurnal slope trends by patient

Based on the individual patient regressions, groups for diurnal slope trend were created as follows;

- Up: 3, 5, 11, 12, 15, 23, 30
- Down: 1, 7, 24, 25, 29, 33, 34, 35, 36

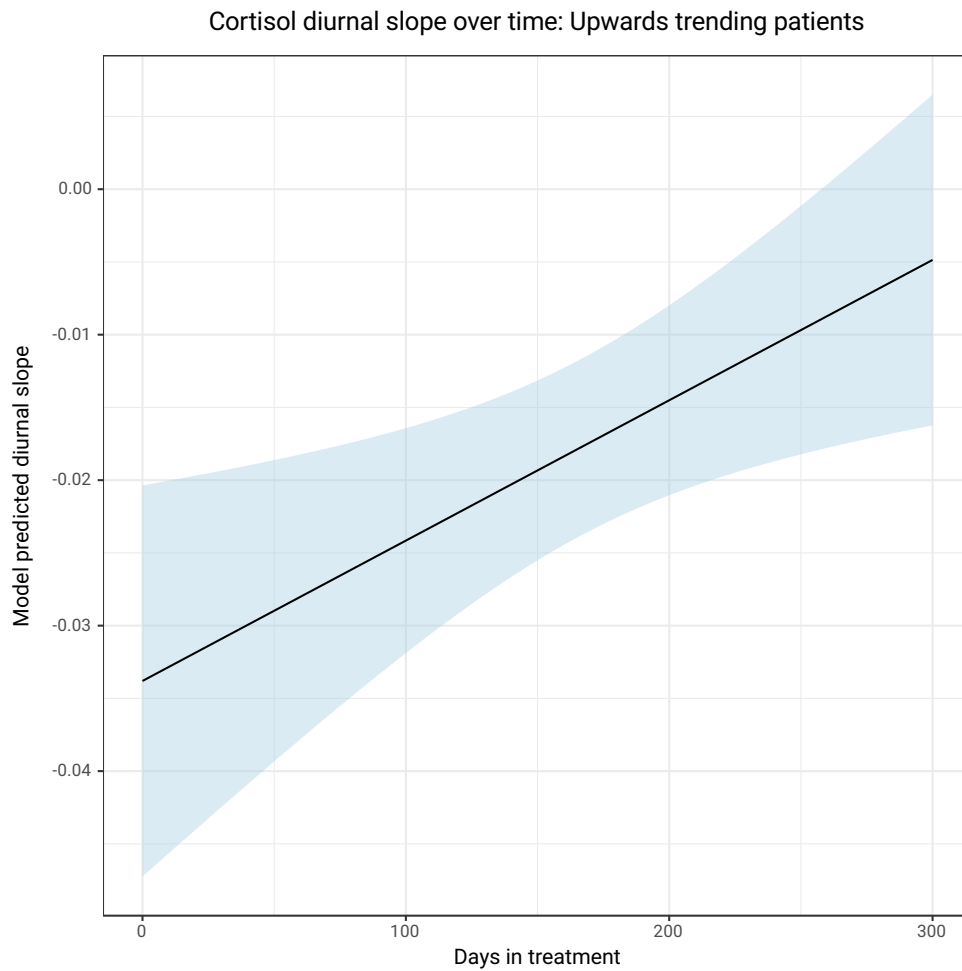


Figure 7.15
Mixed-effects model for diurnal slope over time: Upward trends

Diurnal slope was closely connected to the AUC_g measure, and most of the trend group membership is reversed from AUC_g to diurnal slope. An increasing diurnal slope (i.e., becoming flatter) could produce a smaller or greater AUC_g value depending on the relationship between S1 and S3. For instance, if S1 and S3 both rise (but S3 increases more so) then the diurnal slope will be flatter while AUC_g is likely to increase. Likewise, a decreasing slope (i.e., steeper) could produce either outcome in AUC_g . They are not completely linked however, as the diurnal slope removes the effect of the CAR, whereas AUC_g takes it into account. With Takiwasi patients, a flattening diurnal slope was most often associated with a decreasing AUC_g , and vice versa.

The model for the upwards trending group on diurnal slope (see Figure 7.15) was significant, with $t(17.4) = 2.76$, $p = .01$, and an estimated daily increase in

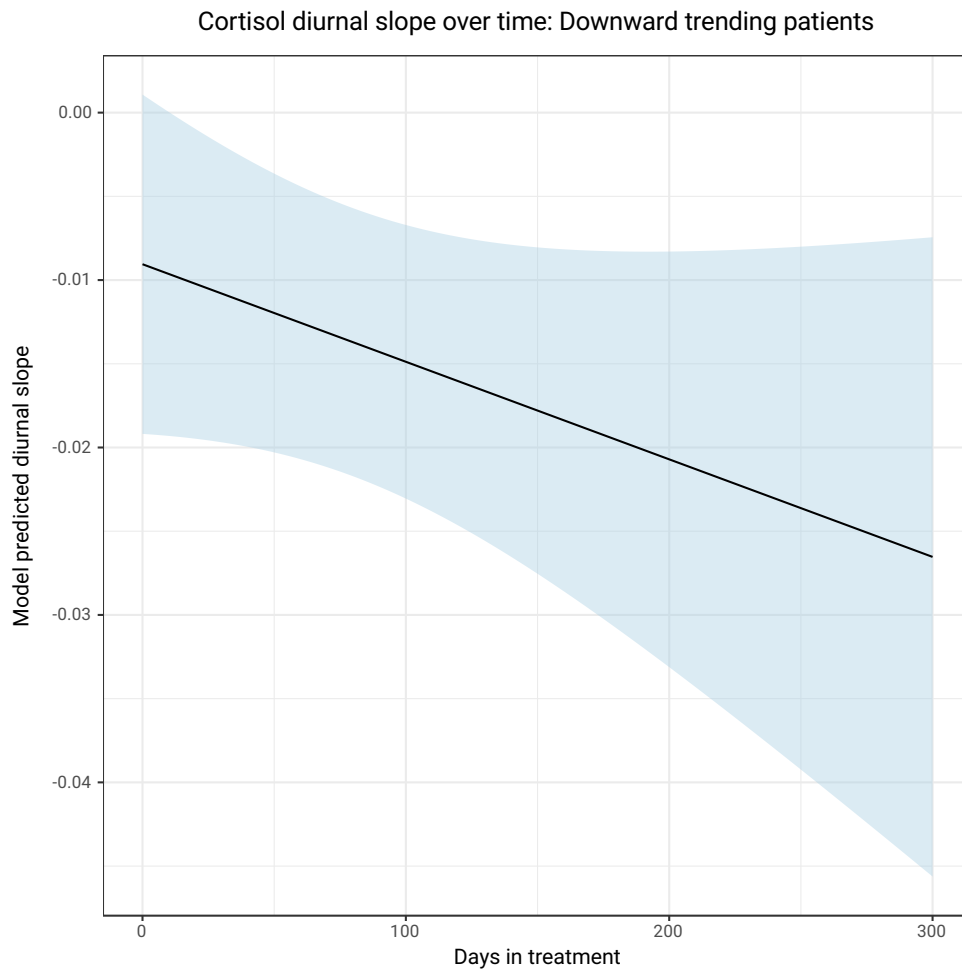


Figure 7.16

Mixed-effects model for diurnal slope over time: Downward trends

diurnal slope of 1.0×10^{-4} , 95% CI [0.2×10^{-4} , 1.7×10^{-4}], $SE = 0.3 \times 10^{-4}$. The model for the downward trending group (see Figure 7.16) did not reach significance, with $t(27.9) = -1.52$, $p = .14$, and an estimated daily decrease in diurnal slope of -0.6×10^{-4} , 95% CI [-1.4×10^{-4} , 0.3×10^{-4}], $SE = 0.4 \times 10^{-4}$.

As with AUC_g and CAR, mean diurnal cortisol rhythms were plotted based on diurnal slope trend grouping (see Figure 7.17). Those patients with a downward trending diurnal slope (i.e., becoming more sharply negative) tended to have lower cortisol levels, compared with higher cortisol levels for those patients with an upwards trend (i.e., with a flattening slope).

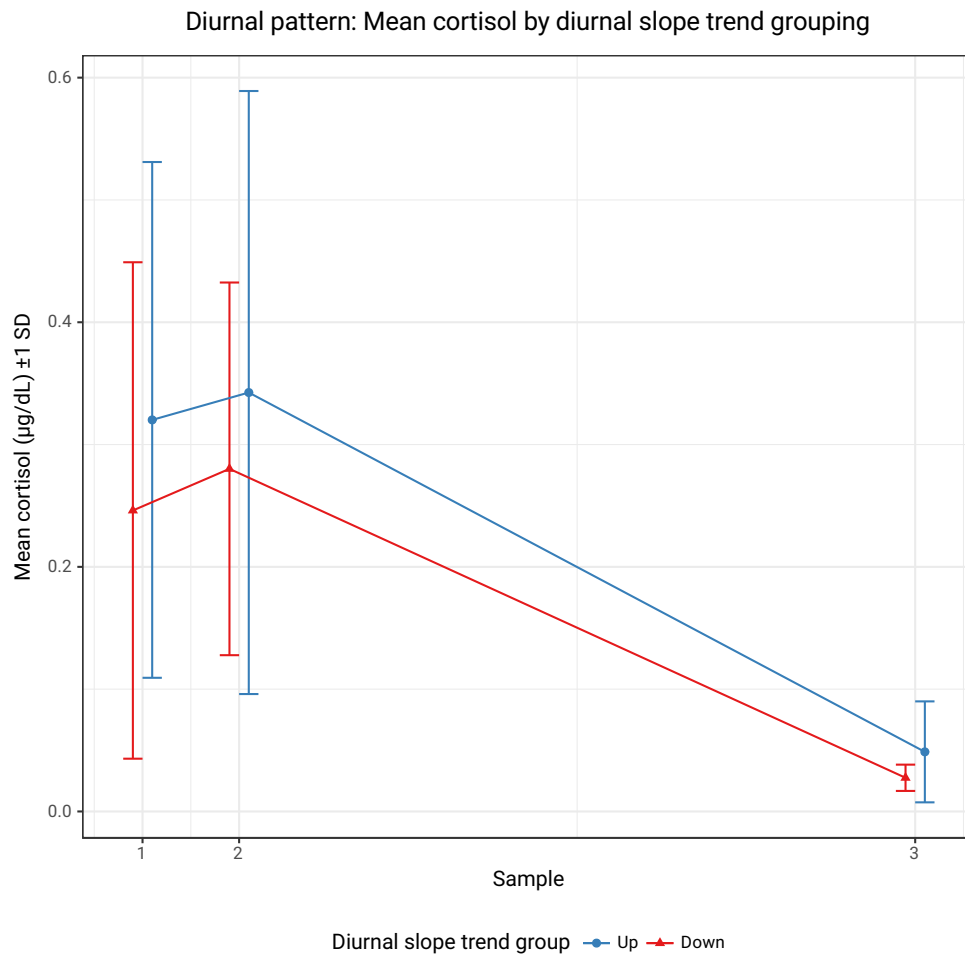


Figure 7.17
Diurnal cortisol by diurnal slope trend

7.3 Discussion

The hypothesis that cortisol secretion patterns would change over time was partially supported, although no uniform direction of change across patients was found. This lack of uniformity, perhaps to be expected based on a review of the literature, led to ambiguity in the meaning of the results.

Interpretation of results

Before examining the results overall, it is worth noting that the biological part of the study demonstrated methodological viability. Samples were collected in a relatively remote part of the world, without the initial aid of laboratory techniques

or expensive technology. While certain logistical obstacles had to be surmounted, the salivary cortisol enzymes stored for up to six months at approximately -20°C proved to remain intact, with credible values being found after laboratory analysis. This confirmed the findings of Hansen, Garde, and Persson (2008), who reported that saliva samples can be stored at -20°C for up to one year.

Although the data remained intact, unfortunately the observational nature of the study, small sample size, and heterogeneous results combined to make interpretation of these data difficult. Even in the context of largely positive psychological change, there is a lack of certainty about the morning cortisol results because no objective measure of the sleep cycle was employed. As shown by Stalder et al. (2016), the awakening response is time-sensitive, and small inaccuracies in the timing of sample collection can translate into large cortisol estimation errors. Late measurement of S1 leads to an underestimation of the CAR (Stalder et al., 2016), and for this reason, it is difficult to be completely sure about the meaning of the irregular CAR patterns seen in Figure 7.2. In fact, of 62 analysed sets, 29 featured a downward or flat CAR. While it is unlikely that all 29 represent errors in measurement (given the forced awakening sampling procedure), a certain ambiguity persists.

Despite the fact that analyses of average daily exposure to cortisol (AUC_g) did not produce significant models, there was some suggestion of linear change in the individual trends (see Figure 7.5). Moreover, it appears that those patients with higher AUC_g scores tended to show decreases over time, while those with lower AUC_g scores tended to show increases over time (see Figure 7.8). These results were largely mirrored in the diurnal slope trend groups, thus there is the possibility of a normalizing process, which would accord with the results of the psychological testing presented in chapter 6. The trends of change in the CAR also support this notion, with steeper responses for those with a decreasing CAR, and flatter responses for those with an increasing CAR (Figure 7.17).

Causal factors

Ayahuasca stimulates the HPA-axis acutely (Callaway et al., 1999; dos Santos et al., 2012; dos Santos et al., 2011) and may be partly responsible for modulating the HPA-axis within treatment. The effects of ayahuasca on serotonin receptors have been hypothesized to regulate dopamine in the mesolimbic pathway (with an anti-addictive effect; Liester & Prickett, 2012), which suggests that ayahuasca could interact with two of the primary neural areas involved in addiction (i.e., the reward and stress systems).

Ayahuasca also has the potential for anti-depressant effects (de Lima Osório et al., 2011; de Lima Osório et al., 2015; Fortunato et al., 2009; Palhano-Fontes et al., 2014; Palladino, 2009), and it is possible that restorations of normal HPA-axis activity may occur in depressed patients treated with ayahuasca (e.g., with reducing cortisol levels). However, this is speculative and the long-term neuroendocrine impacts of ayahuasca remain unknown. Apart from ayahuasca

however, there are a host of other plants and techniques used in Takiwasi that are not well understood at all, to say nothing of the specific actions that they may have on the HPA-axis. This lack of knowledge leaves the biological changes the most difficult to explain, since they are heterogeneous and could conceivably come from a number of sources, including treatment-induced changes, natural HPA-axis normalization from ceasing the use of illicit drugs, simple measurement error, and so on.

Limitations and future directions

Apart from the oft-cited need for a larger sample size, perhaps the most important limitation was the lack of an objective measure of wake-up time. It is particularly important to employ this in an inpatient addiction treatment centre, as there may be a variety of HPA-axis dysregulations present, and it is critical to be able to distinguish between a CAR that has been poorly measured, and one that is genuinely atypical. In the field, solutions based on actigraphy may be the most practical and cost-effective (Stalder et al., 2016).

Two further ideas seem promising with respect to addiction treatment centres and cortisol measurement. The first is the measurement of patient stress responses as a potential marker for treatment progress (e.g., Sinha et al., 2006). While this was initially planned for the present study, it was dropped due to concerns over applying stress-inducing procedures to patients actively undergoing treatment. The second possibility is the use of hair cortisol as a biomarker. For example, Goldberg et al. (2014) found that reduced hair cortisol was correlated with reduced negative affect for smokers who attended a mindfulness based treatment programme. Measuring cortisol in hair samples would not only have the advantage of being the least invasive available method of cortisol collection, but would also be better suited to long-term cortisol measurement.

Conclusion

The biological data represent the final part of the quantitative measurement of the Takiwasi inpatients. Given the trends in the data, the lack of statistical significance (with the exception of diurnal slope) was more likely a function of sample size than an absence of effect (treatment or otherwise). Yet when put in context with the psychological results, it is fair to say that most patients from the biological sample were undergoing some measure of psychological improvement during treatment. The same may be said for physical health, or at least perceptions of physical health. Nevertheless, whilst generally improving on psychological test scores, the patients showed varied patterns of biological change. Indeed, for each cortisol measure, two trends in the data were consistently found. The AUC_g measure was clearly related to the diurnal slope (with reversed trend group membership), although as suggested in the literature, trends for change in the CAR appeared to be separate from AUC_g or diurnal slope (Stalder et al., 2016).

The psychological effects of the treatment can be recounted by patients in their own words and stories (see chapter 5), and they can be quantified and measured using tests (see chapter 6). The question of whether the present results are accurate reflections of concomitant biological changes in the stress system is one that unfortunately cannot be answered with certainty—although the data are not inconsistent with that possibility. If this is indeed the case, a normalization of HPA-axis activity (i.e., away from extreme values in either direction) would seem to be the best supported mechanism.

Part III

Synthesis

Discussion and Critical Reflections

Synopsis In this final chapter the overall findings from the study of Takiwasi are reviewed, initially with a focus on stress and the potential healing mechanisms of the treatment. The centre is then considered within a global frame of reference, specifically concerning its relationship to Western epistemology and academic thought, and the potential difficulties of integrating shamanic healing with respect to secular societies. In closing, the treatment is examined from the perspective of the critical biopsychosocial theory put forward in chapter 2, and a new theoretical analysis is presented which seeks to identify the meaning of addiction as a function of modernity, along with subsequent reflection on Takiwasi's treatment in that theoretical context.

8.1 Observational Findings and Therapeutic Mechanisms

Taken as a whole, the observational results from Takiwasi suggest that clinically positive change within treatment is a likely outcome. Hypotheses predicting that the treatment does more harm than good were contradicted by quantitative data, patient self-report, and participant observation. Quantitative support for a lack of harm was provided by positive trends across a broad range of psychological measures, as well as the possibility of concomitant biological changes in the HPA-axis stress system (although compelling biological data remains scarce). In many cases, patient narratives located a strong treatment effect within the combination of plant ingestion, psychotherapy, and community life. Across this combination, views on which were the most beneficial parts of the treatment varied by patient, although the dieta in particular was nearly always held in high regard.

Of course, these results (including all findings of statistical significance) cannot be extrapolated beyond the constraints of the sampling method. That is, the population under examination consists exclusively of Takiwasi patients—not a random sample of addiction patients more broadly. As explained in chapter 6, an unavoidable selection bias exists which is inherent to the treatment. In terms

of generalization then, the true population is perhaps best considered as those who are: (a) motivated to try Takiwasi's treatment in the first place, and (b) actually accepted into treatment. At the same time, ASI data demonstrated that the Takiwasi population is likely to consist of relatively severe clinical cases¹ who do not necessarily share a common cultural background.

While patient motivation is without doubt a necessary aspect of Takiwasi's programme, initial motivation and treatment expectations are not sufficient explanations for effects. Indeed, preliminary experiences with the treatment are very often demotivating—particularly once the arduous nature of the treatment has been demonstrated through the first purge. However, for many patients these difficult processes reveal tangible therapeutic benefits, and thus the treatment does have an intrinsic capacity to generate motivation in many cases. Perhaps the most common positive motivational turning point is the first ayahuasca session, although this is not always the case.

Assuming the presence of genuine treatment effects, the Takiwasi intervention lays out a number of interesting possibilities for explaining therapeutic mechanisms at the level of the individual (many of which have already been described throughout this thesis). In this section these explanatory mechanisms will be reviewed, with a focus on stress and the treatment as a whole.

Biological healing

The anti-addiction mechanisms suggested by Prickett and Liester (2014) regarding ayahuasca and dopamine modulation (see chapter 3) are associated with the neural opponent-process notions of within-system and between-system adaptations (Koob, 2009).² As an adjunct to addiction treatment, ayahuasca may pharmacologically intervene across both of these systems. Prickett and Liester (2014) hypothesize that ayahuasca disturbs the pathological within-system adaptations via dopamine normalization in the mesolimbic pathway, and likewise disturbs the between-system adaptations via the interruption of maladaptive neuroplastic learning.

Further possibilities for between-system intervention lay in the potential anxiolytic effect of DMT³ at low levels (via trace amine receptor activity; Jacob & Presti, 2005), and in the role of DMT as a sigma-1 receptor agonist (Fontanilla et al., 2009). Sigma-1 receptors have high density in the nucleus accumbens (Maurice & Su, 2009; Weissman, Su, Hedreen, & London, 1988), and Frecska et al. (2016) argue for DMT as protective against oxidative stress (Sies, Berndt, & Jones, 2017), which has been linked to psychiatric disorder and psychosocial

¹When compared with the United States male inpatient addiction population (see chapter 6).

²The within-system adaptations occur where the drug exerts its primary influence, whereas the between-system adaptations occur in other areas (e.g., in the stress systems; Koob & Le Moal, 2008).

³As discussed in chapter 3, DMT is a key alkaloid in the modern ayahuasca brew, and is also likely to be endogenous in humans.

stress (Ng, Berk, Dean, & Bush, 2008; Sivoňová et al., 2004). Indeed, according to Frecska et al., DMT is “better understood not as a hallucinogenic drug of abuse, but rather an agent of significant adaptive mechanisms like neuroprotection, neuroregeneration, and immunity” (p. 4).

Within Takiwasi however, ayahuasca is only one component of the therapeutic approach, and therefore proposing mechanisms limited to ayahuasca healing alone would appear to be insufficient. One feature that is nearly ubiquitous across the traditional techniques employed in Takiwasi is emesis (an indispensable part of traditional “depurative” practices; Sanz-Biset & Cañigüeral, 2013). In fact, the most frequently performed traditional technique in Takiwasi is the purge (which ayahuasca could be considered to be a form of). This focus on emesis and the ingestion of medicinal plants is particularly interesting given recent research on intestinal microbiota and the link between the gut–brain axis and stress:

Key findings show that stress influences the composition of the gut microbiota and that bidirectional communication between microbiota and the CNS influences stress reactivity. Several studies have shown that microbiota influence behavior and that immune challenges that influence anxiety and depressive-like behaviors are associated with alterations in microbiota. Emerging work notes that alterations in microbiota modulate plasticity-related, serotonergic, and GABAergic signaling systems in the CNS. Going forward, there is a significant opportunity to consider how the gut–brain axis and, in particular, new tools will allow researchers to understand how dysbiosis of the microbiome influences mental illness. Neuroscientists [...] are well positioned to tackle outstanding questions [...] and develop innovative approaches to prevent and treat stress-related disorders, including anxiety and depression. (Foster & McVey Neufeld, 2013, p. 311)

While any links between gut microbiota and traditional depurative practices remain unknown, Sanz-Biset and Cañigüeral (2013) have already theorized that the practices may have efficacy for dealing with stress-related illnesses. In light of the potential normalization of HPA-axis activity for Takiwasi patients and the capacity for the gut to influence the HPA-axis, investigation into gut microbiota changes may be an important line of enquiry for future research.

Psychological healing

For Takiwasi patients in the quantitative part of the study, stress and craving were positively related, while there was a negative relationship between stress and desirable attributes such as emotional health or existential well-being. It is known that addictions are commonly accompanied by poor mental health (Cacciola, Alterman, McKay, & Rutherford, 2001; Grant et al., 2004), and the failure to

address co-occurring disorders within a substance abuse treatment context has been described as “tantamount to not responding to the needs of the majority of program participants” (Center for Substance Abuse Treatment, 2006, p. 2).

The possibilities for psychological healing with ayahuasca have been well documented, and with respect to addiction treatment, the resolution of emotional issues or the generation of special insight are often cited (Liester & Prickett, 2012; Loizaga-Velder & Verres, 2014; Talin & Sanabria, 2017; Thomas et al., 2013). These psychological changes can be connected to addiction via the relief of internal sources of stress (e.g., via the transformation of maladaptive patterns or the acquisition of existential well-being). In an external sense, the creation of new cognitive models for experiencing life situations and coping with inevitable stressors helps to build a protective reserve against stress-based relapse.

There are at least two pathways to such psychological healing⁴ in Takiwasi. The first is through direct physiological and pharmacological effects resulting from plant ingestion, as discussed previously (i.e., giving primacy to plant–human biochemical relationships; Sullivan & Hagen, 2002). The second, which in Takiwasi is inseparable from the first pathway, is through the mechanism of symbolic healing (i.e., giving primacy to meaning). The symbolic content that each patient experiences as his own personal healing narrative in Takiwasi occurs in four distinct areas of action, which are as follows: (a) ritualized plant sessions (including but not limited to ayahuasca sessions), (b) clinical sessions with psychologists, (c) dreams, and (d) everyday life in the therapeutic community. While all four areas of symbolic action are necessarily interconnected, each one is modulated by the effects of plants (especially so within the ritualized sessions). This is an important point which has direct relevance for discussion of the primary symbolic mechanism.

Symbolic healing

James Dow’s universal model of symbolic healing (1986), briefly described in chapter 4, provides a useful theoretical framework with which to understand healing in Takiwasi. The healer’s restructuring of the patient’s psyche via emotional transaction based in a *mythic world*⁵ is a valid meta-model of the general psychotherapeutic process, and it is particularly applicable to Takiwasi’s iterative process of plant ingestion, psychotherapy, and therapeutic community life.

However, the difficulty in neatly applying Dow’s model is that within Takiwasi the most important symbolic transactions remain unobservable (i.e., the acute effects of psychoactive plants on consciousness). It is true that the plants’ effects are often modulated by the healer, yet the plant–person interface (which is often

⁴Note that “psychological healing” here does not imply a lack of biological change. It rather refers to the kinds of change that are best described at the psychological level (and which undoubtedly entail concomitant biological change).

⁵The “mythic world” refers to cultural knowledge about healing that is experientially true from an emic (internal) perspective (see Dow, 1986, p. 59).

experienced as a relationship; Håland, 2014) must be considered in order to provide an accurate reflection of the treatment. This not only raises the question of what, or who, is doing the restructuring for the patient (thereby opening up an assortment of ontological issues; Losonczy & Cappel, 2014; Tupper & Labate, 2014), but also marks a fundamental knowledge problem when dealing with radically divergent but impenetrable subjective states.⁶

In the world of entheogenic experience, meaning is primary. Moreover, meaning is most often delivered not in an abstract intellectual sense, but with a quality that Pahnke (1969), borrowing from William James, refers to as *noetic*. James wrote about this quality as an attribute of mysticism:

Although so similar to states of feeling, mystical states seem to those who experience them to be also states of knowledge. They are states of insight into depths of truth unplumbed by the discursive intellect. They are illuminations, revelations, full of significance and importance, all inarticulate though they remain; and as a rule they carry with them a curious sense of authority for after-time. (W. James, 1902/2008b, p. 267)

Aldous Huxley, writing about his experience with mescaline⁷ as a research subject in 1953 (Huxley, 1954/2009), gives a fair insight into the difficulties of communicating such states. At some point during Huxley's experience his attention had settled on some commonplace pieces of furniture. Deeply under the influence of the mescaline, his gaze ceased to be one of a "utilitarian who has to sit on chairs", and was instead shifted to that of the "pure aesthete whose concern is only with forms and their relationships within the field of vision" (pp. 21–22). His viewpoint then departed from usual consciousness in a profound manner:

Table, chair and desk came together in a composition that was like something by Braque or Juan Gris, a still life recognizably related to the objective world, but rendered without depth, without any attempt at photographic realism. [...] But as I looked, this purely aesthetic, Cubist's-eye view gave place to what I can only describe as the sacramental vision of reality. [...] Everything shone with the Inner Light, and was infinite in its significance. The legs, for example, of that chair — how miraculous their tubularity, how supernatural their polished smoothness! I spent several minutes — or was it several centuries? — not merely gazing at those bamboo legs, but actually being them — or rather being myself in them; or, to be still more

⁶Nagel (1974) frames this problem of subjectivity in a more generalized manner.

⁷Mescaline is a major alkaloid in the peyote cactus (Rätsch, 2005, p. 334), which is a plant that has been used in the North American Church to treat alcoholism (Albaugh & Anderson, 1974; Pascaro et al., 1976).

accurate (for “I” was not involved in the case, nor in a certain sense were “they”) being my Not-self in the Not-self which was the chair. (pp. 21–22)

While Huxley endeavours admirably here to describe something apparently indescribable, there is a certain futility in the use of language to convey subjective states that are culturally alien in modernity.⁸ Without comparable experience as a reference point, what imagined form of existence can the reader possibly attach to phrases like “the sacramental vision of reality” or “infinite significance”? Similarly, many of the most important experiences for Takiwasi’s patients remain trapped, to varying degrees, behind subjectivity and the inadequacies of language. Yet however well the patients’ narratives might be recounted, the essential roots of symbolic healing in Takiwasi cannot be found in intellectual abstraction, but rather in the emotional content and noetic⁹ qualities of the encounter between plant, patient, and healer.

The extent to which these roots are further developed into more usual forms of symbolic healing (e.g., through psychotherapy) largely depends on the individual. For example, Isaac was adamant that ayahuasca alone, even with its famed capacity to promote radical change, would not be sufficient for healing:

Isaac: For some people the treatment just doesn’t work. You have to play your part, you have to want a better life. I know that I could leave here, but I also know that I’m getting better. I really want to be strong and happy in my life, and I’m going to give everything I have to do it. For the best results you have to give all of who you are. The ayahuasca won’t do the treatment for you—I’m one hundred percent positive about that.

The mechanism of symbolic healing in Takiwasi can be considered as a dual system that has both an inner core and an outer layer. The core is where the most extreme transactions take place, and which are on the whole prompted by evolutionary plant–person biochemical relations (e.g., during sessions with ayahuasca, purgahuasca, certain purge plants, and possibly also during diets). Within this core might exist the kinds of mystical experiences that Pahnke (1969) described (e.g., featuring unity, transcendence of time and space, a sense of sacredness, or paradoxicality), but also intense introspection, the reliving of trauma and painful memories, profound suffering, existential terror, and possibly experiences of spiritual redemption (Dobkin de Rios et al., 2002; Kjellgren et al.,

⁸This is an old and persistent problem. Leary, paraphrasing a “well-known physicist”, wrote: “Those who have taken a psychedelic drug realize it can’t be talked about and those who haven’t naively assume that it can be talked about with the current vocabulary” (D. Solomon, 1966, p. 24).

⁹Again, in James’ (1902/2008b) sense of the term as the quality of a mystical state that imparts seemingly authoritative knowledge.

2009).¹⁰ Of course, for some patients the core might also contain little that is noteworthy or of substantive value.

It is this inner core that functions as a catalyst, and which is connected to the outer layer of symbolic healing. The outer layer represents the intervention point for Takiwasi's therapeutic staff (viz., psychologists and curanderos). The connection between the two systems of symbolic healing can be considered as a response to Kirmayer's (1993) rhetorical question regarding psychotherapy:

Far from the crises of symbolic death and rebirth depicted in ethnography, the talking cures of psychotherapy consist of thousands of small turns that repair, restore and mend the damaged, locate new possibilities or carry the sufferer forward into a new situation. Though there is plenty of smoke, where in all this talk is the transmuting fire? (p. 161)

In Takiwasi the "transmuting fire" of symbolic death and rebirth is joined together with psychotherapy. For patients then, healing processes unfold as personalized narratives of change that are punctuated by periods of intense symbolic activity. Those intense transactions that take place in the core, modulated as they are by the actions of the curanderos, are potentially reworked into symbolic healing in therapy. The core transactions not only allow for emotional content to surface, but also encourage acceptance of the mythic world proposed by the therapist, and thus a more fluid manipulation of emotional content and cognitive structures.

In other words, the dual-system symbolic process found in Takiwasi provides the patient with a means to restructure his relationship to himself, to objects of addiction, and indeed to the world in an existential sense. Presumably such restructuring occurs through the same kinds of neuroplasticity that are involved in all learning. When this results in the transformation of maladaptive behavioural and psychological patterns (such as those that contribute to addictions), then the claim of successful healing is valid.

Spiritual healing

Thus far, the discussion on mechanisms has essentially been an expanded analysis of the bio-symbolic healing complex described in chapter 4. This healing complex reaches the limits of currently acceptable academic thought but, as already argued, does not serve to fully explain the traditional healer's perspective. In fact, it may not even fully explain the patient's perspective, as suggested by the following passage from a Santo Daime member (and former opiate addict):

¹⁰It should be noted that the use of plants (or synthesized chemicals) is not a prerequisite for achieving comparable states of consciousness (e.g., Grof, 2003).

With Ayahuasca, I had this view from the top. I saw how everything was part of the loop of addiction. [...] The Daime¹¹ showed me how these forces of addiction act. I talk about it as if they are conscious, because that's how I perceive them. These forces aren't interested so much in the substance, but to what we bring out when we are addicted to something. If you take away their support they find other supports, and in the world in which we live now there can be so many different supports. People who haven't had problems with substances are dependent on a lot of other things, unaware that these things are a support for these forces of addiction to act in them. These destructive effects may not be as striking as with heroin, perhaps. But addiction can prove harmful in many more ways. (Talin & Sanabria, 2017, p. 27)

Interventions in the spiritual realm (i.e., in an objective part of external reality, as opposed to a purely symbolic or metaphorical concept) represent the final potential healing mechanism in Takiwasi. The analytical problem here is not one of establishing relationships between spirituality and addiction. For instance, religiosity is likely to be inversely related to addiction (Geppert et al., 2007; W. R. Miller, 1990) and is oftentimes positively related to mental and physical health (Nelson, 2009; Seeman, Dubin, & Seeman, 2003). Indeed, spiritual (or mystical) experience is a central component in the use of psychedelics and entheogens to treat addiction (Boevig, 2010; Dobkin de Rios et al., 2002; Liester & Prickett, 2012; Rich, 2012; Talin & Sanabria, 2017; Thomas et al., 2013), and this is also true for Takiwasi.

The problem when discussing spirituality and healing with relation to Takiwasi is not a matter of utility, but rather ontology. While it remains unproblematic to write about the utilitarian functions of spirituality in a psychosocial sense (e.g., Koenig, 2009), the same cannot be said of any handling that takes the spiritual world itself to be an objective and discoverable externality. Nonetheless, such a perspective does predominate in Takiwasi, although there is less room for analysis if one refrains from either pathologizing the curandero or explaining the spiritual world in terms of cultural semiotics. For this reason no further analysis will be attempted here, except to note the claim from Takiwasi's curanderos that the removal (or not) of negative spiritual attachments and conditions can have real world consequences—particularly in cases of addiction and psychotic episodes (e.g., Labate et al., 2011).

8.2 Takiwasi in Global Context

As an addiction treatment centre utilizing psychoactive plants, Takiwasi is positioned in an unusual manner with respect to long-standing Western drug policy.

¹¹Within the Santo Daime church, ayahuasca is referred to as *daime*.

The highly influential “war on drugs”, deemed an “unmitigated failure” by Wood, Werb, Marshall, Montaner, and Kerr (2009) due to harmful macro-scale effects, has nurtured a political environment where theories of substance abuse have been favoured over theories of use. Yet inherent in Takiwasi’s treatment modality is the claim that addictions can be healed through the alteration of consciousness via judicious substance use (i.e., beyond drug substitution or targeted pharmacotherapies). The broader claim is therefore that traditional Amazonian medicines can have adaptive uses in the modern world (J. Mabit, 2001).

Ayahwasca and academia

Although the Takiwasi treatment involves quite a broad range of traditional plant medicines, in academic work the centre is most often discussed in the context of ayahuasca studies. The earliest recorded scientific enquiry into ayahuasca (or at least, *Banisteriopsis caapi*) dates back to Richard Spruce’s mid-19th century ethnobotanical journeys (Spruce, 1908/2005). However, wider academic interest did not begin to take hold until the 1990s, and ayahuasca-specific research has since grown into an area of study unto itself (Beyer, 2012).

The focal points of ayahuasca studies can be broadly categorized into the following areas: (a) clinical and health sciences (e.g., Barbosa et al., 2012; dos Santos, Balthazar, Bouso, & Hallak, 2016; Riba & Barbanoj, 2005); (b) indigenous or mestizo usage (e.g., Luna & Amaringo, 1999; Naranjo, 1979; Rodd, 2008); (c) Brazilian syncretic ayahuasca-using churches (e.g., Labate & MacRae, 2010); (d) neo-shamanic movements (e.g., Gearin, 2015; Rodd, in press); and increasingly often, (e) issues surrounding globalization in relation to the Brazilian religions and neo-shamanism (e.g., Blainey, 2015; Labate, Cavnar, & Gearin, 2017), and also the effects of globalization on Amazonian indigenous and mestizo peoples (e.g., Dobkin de Rios, 2005; Dobkin de Rios & Rumrill, 2008a; Fotiou, 2016; Labate & Cavnar, 2014).

Although these categories do not necessarily allow for a clear demarcation of work, they do outline the major research areas at present. As academic and Western interest in ayahuasca increases (becoming a matter of concern beyond remote indigenous peoples), ayahuasca studies increasingly assume a multidisciplinary character (Beyer, 2012). This multidisciplinary approach broadly forms a biopsychosocial research programme, with anthropology roughly towards the apex as a result of ayahuasca’s cultural heritage. From a biopsychosocial standpoint (which tends to be ahistorical outside of the social level), there are two fundamental assumptions that can be drawn out from the contemporary literature. The first is that ayahuasca can be understood as a more or less decontextualized biomedical object with certain innate properties, such as pharmacological safety or anti-depressant effects (e.g., de Lima Osório et al., 2015; Riba, 2003; Riba et al., 2001).¹² The second assumption builds on the first, and holds that ayahuasca

¹²“More or less contextualized” because in these clinical studies attention is given to the concepts of set and setting (as in the psychedelic model; D. Solomon, 1966).

is a pharmacologically safe, but culturally relative object that can be configured to suit arbitrary patterns of ritualized usage (e.g., Dawson, 2017; Gearin, 2015).

In relation to religion and spirituality, the danger of the biopsychosocial model is that it constitutes a totalizing force which renders superfluous the actual content of religion and spiritual beliefs (Bishop, 2009). With respect to indigenous cosmology and ritual, the tacit biopsychosocial paradigm of contemporary ayahuasca studies produces a similar outcome. Academic analyses of ayahuasca usage are naturally drawn towards a cultural form of Leary's classic psychedelic hypothesis: Namely, that *set* (i.e., individual psychological variables such as expectation) and *setting* (i.e., the immediate environment in which the substance is taken; D. Solomon, 1966, pp. 22–23) are the primary determinants of the resultant experience. For example, Loizaga-Velder and Verres (2014) write that:

Ayahuasca should not be understood as a primarily pharmacological intervention. Rather, it should be conceptualized as a catalyst with a therapeutic value that can unfold when the identified variables of set, substance, setting, and integration are appropriately managed. (p. 69)

“Integration” hinges on Eisner's (1997) extension of the set and setting hypothesis to include *matrix*, which she defined as: “That environment from which the subject comes, such as family and living situation; the environment the subject is living in while having sessions; and the environment to which a patient returns after successful therapy” (p. 215). Matrix is thus especially contingent on broader sociocultural factors. As a whole then, the assumptions of the various disciplines (being underpinned by neuro-pharmacology, set, setting, matrix, and culture) converge to relativize traditional and indigenous knowledge systems as unprivileged forms of cultural variation which have no objective validity beyond their localized psychosocial functions.

The status of cultural relativism as an analytical given has been further reinforced by globalization's effects on local shamanic practice (creating a glut of “diversity”; Dobkin de Rios, 2005) in conjunction with anthropological evidence that the indigenous use of the modern ayahuasca brew is not universally ancient across all groups (if it is indeed ancient at all). For instance, regarding the recent uptake of ayahuasca amongst the Matisgenka and Yora groups, Shepard (2014) writes:

Neither religion nor healing was necessarily central to their initial adoption of the new ayahuasca brew. Rather, in both cases, the new brew was perceived as more potent and efficacious than the previously available psychoactive preparations and, for the Yora especially, it provided novel possibilities for negotiating with spiritual and cultural others. Are Europeans who encounter ayahuasca for the first time really so different when they, too, become enthusiasts? (pp. 34–35)

The most straightforward answer to this question of difference is contained in the quote itself: That is, for the indigenous groups, the novel brew had greater efficacy than previously available preparations for interfacing with their spiritual and cultural worlds. In short, the indigenous groups are far more likely to have shared cultural and social frameworks in place for the use of psychoactive plants, as opposed to the West where non-deviant psychoactive substance use is generally restricted to productivity or recreational purposes (although medical applications are tolerated to a limited degree). Since the majority of modern psychedelic or entheogenic substance use thus departs from widely shared social norms (often including the law; Baker, 2005; Blainey, 2015; Cakic et al., 2010; Calabrese, 2001; Deluca et al., 2012; Orsolini et al., 2015), the question arises as to how Takiwasi's treatment can function for those patients without the requisite cultural frameworks for integration (viz., the bulk of patients).

Treatment integration for patients

In a successful treatment at Takiwasi, psychoactive plant use develops three primary patient relationships, with each having integrative psychosocial functions. The first relationship is toward the self and others, and it is managed through psychotherapy along with various workshops and the daily community life of the *convivencia*. This focus on the self would seem to be an indispensable resource for those patients from highly individuated cultures (that being generally characteristic of modernity). Psychotherapy in Takiwasi also affects the second relationship, which concerns the patient and nature (and which modern technological society tends to promote an alienation from). More specifically, psychotherapy mediates the person's relationship towards the plant-based alteration of consciousness, and the ethical and ontological issues that surround it (e.g., including notions of substance use, safety, and revealed internal and external forces). On this point, J. Mabit (2007) writes:

The brutal discovery of the psychic and energetic potentials enclosed within our being and in nature contains a potential for a fascination that can end in the possibility of alienation. In fact it is common to see Western subjects or addicted patients discover their callings as "healers" or "shamans" at the end of a session where they were able to visualize the circulation of energies. The therapist needs to teach them that they saw something common and ordinary and that there exists an abyss between seeing their eventual potentials and believing that one already completely possesses them. The subject can consequently attribute to the egotistical self the powers that pertain to the higher SELF. The therapist, thus, plays a fundamental role in permitting the patient to discern what emerges from their projections and what could really constitute fundamental information that transcends them. By defect, we find ourselves again with the frequent

risk in the New Age environment of producing an inflation of the ego instead of the amplification of consciousness. (pp. 97–98)

Thus apart from its overt therapeutic role, psychotherapy in Takiwasi also functions as a system of guidance for discerning between idiosyncratic psychological material and apparent manifestations from elsewhere. Of course, this hinges on the possibility for ayahuasca (and other plant preparations) to uncover objective truths about reality, and also the potential for misunderstandings and misconceptions. As discussed in chapter 4, the postulate that ingesting plant substances (under certain conditions) can reveal valid knowledge constitutes a major departure from all modern Western epistemological assumptions; however, irrespective of whether or not this position is accurate, the relationship to nature and consciousness alteration encouraged by Takiwasi's programme does carry an integrative function. That is, it tends to create a sense of respect in patients regarding the alteration of consciousness, and it deters the recreational or experimental use of psychoactive substances in general. This is obviously adaptive in cases of drug addiction, but it is particularly relevant in drawing a distinction between substance use and substance abuse, and moreover is important for allowing patients to return to mainstream society without a residual fixation on entheogenic experience.

The third integrative relationship that is developed in Takiwasi is the spiritual. As distinct from the syncretic approaches of the major Brazilian ayahuasca religions,¹³ the therapeutic use of plants in Takiwasi remains separated from religious rites or doctrine. Even though Takiwasi's curanderos adopt the kinds of Christian symbolism often found in traditional mestizo *vegetalismo* (along with Christian faith; Apfell-Marglin, 2007; Luna, 1984b), the treatment itself is arranged to accommodate religious pluralism. For patients then, the treatment can become decoupled from Christianity due to the partitioning out of traditional religious practices (e.g., meditation or mass) from traditional plant-healing practices (e.g., ayahuasca sessions). This separation enables patients to participate in the treatment while following their own spiritual path—which may or may not coincide with Christianity.

Despite the fact that the use of ayahuasca might kindle an interest in spirituality, such interest does not necessarily translate into long-term spiritual or religious practice (Trichter et al., 2009). The separation of religion and plant healing in Takiwasi therefore provides an integrative advantage, as patients become accustomed to the particulars of religious practice in a traditional sense (i.e., without the direct accompaniment of psychoactive plants). Upon exit from treatment, those same patients then have the possibility of becoming involved in organized religious communities that are culturally congruent within mainstream society. That said, the extent to which this actually occurs in practice remains a matter for future research, especially given the modern tendency towards secularism.

¹³Those religions being the Santo Daime (Cemin, 2010), the União do Vegetal (Goulart, 2010), and the Barquinha (Sena Araújo, 2010).

Traditional medicine in modernity

Thus far, an examination of the claim for traditional Amazonian medicine's modern utility has revealed complexities that extend beyond notions of biomedical efficacy. Takiwasi's treatment, being founded on the basis of a genuinely intercultural medical project, raises two important concerns around integration. The first, namely the patient's potential to integrate the treatment within his own psyche and to subsequently reintegrate himself within broader society, was discussed in the previous section. The second issue concerns the manner in which traditional Amazonian medicine is itself integrated with modernity.

For the traditional healer in a globalizing world, unforeseen challenges can be created as Western people bring uniquely Western health conditions to treatment. As described in chapter 2, addiction is a socially contingent illness, but there are other potentially complicating factors such as metabolic disorders, psychiatric conditions, pharmaceutical drug interactions, and so on. Yet generally speaking, indigenous systems of medicine are more capable of absorbing Western innovations and methods than the reverse case. For example, according to Wright (2013), the Baniwa shamans of the Brazilian northwest Amazon are not averse to Western medical knowledge:

As one young shaman perceptively observed, the indigenous peoples have sicknesses that Western biomedicine cannot even diagnose. [...] By contrast, *pajés* [shamans] recognize Western biomedicine as complementing their own practice in the sense of treating ailments that are believed to be transmitted by or sent by the white people.¹⁴ (p. 20)

The key point here is the pragmatic distinction between two medical systems found in "sicknesses that Western biomedicine cannot even diagnose". While the biopsychosocial model can theoretically accommodate culture-bound syndromes (Ventriglio, Ayonrinde, & Bhugra, 2016) as well as the symbolic action of shamanic healing (i.e., the psychosomatic; Novack et al., 2007), the suggestion that shamanic techniques might reveal (or manipulate) some aspect of reality currently beyond the reach of Western scientific knowledge remains intolerable. Yet these are the circumstances for Takiwasi, not only because traditional medicine has been integrated whilst maintaining philosophical parity with Western medicine, but because it is empirically congruent with the healers' experience.

As for many indigenous groups (and indeed, the world's major religious traditions), the everyday world that we usually perceive is not considered to be a complete representation of reality (Brown, 1986a; Harner, 1973, 1993; Luna, 2011). In contrasting Amerindian thought and the West's multicultural view of native cosmology, Viveiros de Castro (1998) write: "Where [the Western view is]

¹⁴And see Brown (1986a) for an elaborated example of medical plurality.

founded on the mutual implication of the unity of nature and the plurality of cultures [...] the Amerindian conception would suppose a spiritual unity and a corporeal diversity” (p. 470). Within Takiwasi, ayahuasca and other sacred plants are held to increase the permeability of our ongoing relationship to a spiritual world populated with forces both good and evil, and therefore some means of control are required (see chapter 4). Those means of control, as described by J. Mabit (2007), are found in ritual:

Ritual is subject to the intensity and rigorousness of symbolic forms that reign in the Universe, which are transcultural and belong to a transcendental order. The ritual involves a language that cannot be improvised and requires a long apprenticeship. Many Westerners, lacking formation in this domain, erroneously imagine that an aesthetic and agreeable context is sufficient, and that ritual is no more than an elaboration of a suggestive environment designed to create a simple state of relaxation. Ritual is always operative and effective, and a lack of recognition of what could be called a “technology of the symbolic or sacred” can generate perturbations in subjects during and after their exploration of the “other world”. (p. 92)

It is these apparent “perturbations in subjects during and after their exploration” that are of concern for Takiwasi’s curanderos. There is obviously a major disjunction here between the biopsychosocial explanatory model and the model that prevails in Takiwasi, and therefore a tension with the kinds of understanding produced by contemporary academic ayahuasca studies. For example, Dawson (2017) exemplifies the model outlined earlier which depicts ayahuasca as a culturally relative, but inherently advantageous object. According to Dawson, traditional practices offer a “wide range of themes and tropes” (p. 29) which contribute to providing the “ritual ayahuasca consumer with an enhanced degree of choice and expression” (p. 31).

When it comes to the ontology of indigenous beliefs, Western epistemological assumptions nearly force the adoption of a relativist position, which inevitably leads to the “relativization of all forms of practical knowledge as metaphorical” (Dawson, 2017, p. 31). Because all praxis is swept up as cultural metaphor, traditional systems themselves become objects suspended in the logic of market-place consumer choice, and thus contemporary ritual becomes “characterized by a highly valorized sense of subjectivity in which the individual is viewed as both the primary agent of self-transformation and ultimate arbiter of spiritual authority” (p. 28; and see Gearin, 2015).¹⁵

¹⁵But as Fotiou (2016) writes: “When indigenous knowledge is appropriated, it takes on the fragmentary nature of our society (Vitebsky 2003:296). As I have argued, global culture seems unable to capture the holistic nature of indigenous knowledge because there is a lack of context for belief and application” (p. 170).

This globalized understanding of ayahuasca (i.e., where individuality is paramount), is sharply at odds with the traditional mestizo understanding found in Takiwasi. For Takiwasi, ayahuasca is not inherently safe nor able to be used arbitrarily. In a similar manner to the Peruvian *vegetalistas* mentioned in chapter 4, the primary danger is held to be spiritual—although conducting a safe session is possible for a trained practitioner. Such a position is not especially unusual given that shamanic techniques have never been limited to healing alone (Whitehead & Wright, 2004), and that ayahuasca likewise has a range of uses beyond healing, which include malicious applications (Lagrou, 2004; Luna & Amaringo, 1999; Pollock, 2004; Schultes, 1982).

Despite the fact that these concerns exceed Western biopsychosocial rationality, the question of how to integrate traditional Amazonian medicines ceases to be theoretical and becomes concrete when problems arise for an individual (which need not necessarily be associated with acute effects). In the West this falls back upon psychiatry in extreme cases (dos Santos et al., 2017), but if the “perturbations” described by J. Mabit (2007) are genuine phenomena, then they may be difficult to manage or even properly diagnose using Western medical knowledge (as the Baniwa shamans claim for certain conditions). Recently, two brutal murder cases in Australia have made mention of ayahuasca use (Mooney, 2017; Prosser, 2016), and while it is not feasible to establish the causal factors with any certainty, the possibility remains that the perspectives of traditional healers may be of greater importance than Western assumptions currently allow for.

8.3 Reconsidering Addiction, Treatment, and Cure

It has been established that Takiwasi’s addiction treatment may be an effective option for certain patients, potentially acting through multiple healing mechanisms. Yet the application and integration of the traditional Amazonian component has been shown to be far from straightforward in either theoretical, practical, or political terms. With an understanding that the effects of ayahuasca and traditional Amazonian medicines in Takiwasi are both contingent upon the centre’s practices and also connected to a particular tradition (i.e., *vegetalismo*), the discussion in this thesis can now turn to its final goal, which is the synthesis of Takiwasi as a treatment centre in terms of the addiction theory outlined in chapter 2.

The critical biopsychosocial model of addiction

Biopsychosocial theory depicts addiction as a multifaceted disorder: On one level it is defined by brain pathology, on another by harmful compulsions and an apparent erosion of free will, and on yet another by sociocultural contexts which promote addiction. But as J. Wallace (1993) pointed out some time ago, the social level has been the least theorized: Instead of recognizing the strong social elements of addiction, recourse to scientific evidence based in biological reductionism has

generally proved more attractive (although this is changing as anthropological interest grows; Garriott & Raikhel, 2015). The problem with over-reliance on such an approach is not found in experimental scientific methods and associated findings (e.g., demonstrations of long-term brain changes in laboratory animals or drug abuse patients), but rather in the interpretation of those findings and their reinsertion back into a model of social life. The basic view, which is now fairly well entrenched in secular society, is that biology dictates life (and therefore medicine). In other words, the view is that the scientific objects of biological analysis (e.g., genes, neurons, etc.) form a largely independent and separated domain, even if it is accepted that they can be modulated by technical intervention. Such a view is demonstrated in the following passage, from *The New York Times*, regarding Abraham Lincoln's mental health:

Lincoln suffered from recurring episodes of what would now be called depression from early childhood onward. In light of what we know today, an effort to link them to emotional disappointments rather than to a chemical imbalance seems quaint rather than scientific. (Schreiner, as cited in G. A. Miller, 2010, p. 718)

The implication is that “chemical imbalances” are pre-existing biological conditions which are decoupled from social causality¹⁶ and indeed life itself (the apparently “quaint” notions). In effect, the brain becomes an isolated, decontextualized, and deterministic biological machine with no reason for depression other than biological bad luck (Bullard, 2002). When this reasoning is applied to addiction, the analytic path of least resistance locates the problem in a combination of personal biological flaws (e.g., genetic susceptibility) and the inherent addictive capacity of a substance, usually put in terms of its effects on the reward pathway. Yet as argued at length in chapter 2, the context is critical. Naturalist Eugene Marais noted its importance in his observations of tobacco use in wild versus captive baboons:

Marais found that the wild baboons had many opportunities to eat tobacco as the troop passed through tobacco fields on their forays to orchards. However, unlike other observers, he never saw them make use of it. Tobacco also grew around Marais's hut, which the baboons frequently visited without touching the plants. Yet all the *captive* baboons he observed “beg for tobacco and eat or chew it with all the zest of a long-established habit.” He even described tool using in a captive male baboon who had learned to scratch the oil out of a pipe stem with a blade of grass, which he then cleaned onto a piece of paper, rolled up, and chewed. (Siegel, 2005, p. 88)

¹⁶See Hertzman and Boyce (2010) for a review of social causality from the perspective of developmental health.

Undoubtedly, the recognition that addiction involves brain changes has been instrumental in tempering a moralist model which treats addicts as simply deficient in character (even if policy changes have not always reflected this; Courtwright, 2010). Yet noting changes in brain structure does not make irrelevant the context within which those changes take place. As Levy (2013) writes:

Addiction is not best understood as a brain disease, though it certainly involves pathological neuropsychological dysfunction. Addiction is a disorder of a person, embedded in a social context. The neuroscientists and their allies have mistaken some necessary conditions of the disorder with the disorder itself. Notwithstanding this claim, there is, nevertheless, a strong case for saying that addiction is often a disease. Restoring addicts to their social contexts does not require us to accept the view of addiction to which the neuroscientists oppose themselves, the moral model. Rather, we can situate the addict in a social context, and even recognize that judgments about disorder are partially normative, without abandoning an entirely naturalistic framework. (p. 1)

The disease model, which portrays addiction as a behaviourally acquired chronic brain illness (McLellan et al., 2014), thus tends to reserve less analytical space for the fact that addiction is always an adaptation to a social context (i.e., it is always part of some effort towards carving out a life within society; Alexander, 2000; Bourgois & Schonberg, 2009; Seear & Fraser, 2010; Snodgrass, Lacy, Francois Dengah, Fagan, & Most, 2011). Although it is acknowledged that the pathological brain changes resulting from drug abuse do not occur in a social vacuum (e.g., Leshner, 1997, p. 46), a fully biopsychosocial theory demands a more thorough analysis. Moreover, if the complete range of human behaviour is to be captured, then it requires a recognition that overwhelming and compulsive involvement in behaviours which are harmful cannot be sensibly limited to the use of drugs alone (Alexander & Schweighofer, 1988).

The biopsychosocial theory outlined in chapter 2 builds on the well-established relationship between stress and addiction to extend theory beyond drug-induced brain changes in biologically vulnerable individuals. The basic theoretical foundation, expressed in Figure 2.1, positions a bio-culturally mediated individual within a sociocultural environment. The social relationship to addiction is then defined by an oppositional probability scale which suggests the likelihood of impoverishment versus enrichment for human beings living in that environment. As already discussed, impoverishment is a key biopsychosocial substrate for addiction (again expressed as a probability in Figure 2.1), and it functions as an effective principle for the development, maintenance, and re-acquisition of addictions.

Conversely, organisms in an enriched environment are more likely to achieve a corresponding internal enrichment (and vice versa to contribute to the formula-

tion and maintenance of an enriched environment), and the external and internal consequences for individuals might be best described as material and existential well-being. Under such idealized conditions the meaning of addiction itself is altered: Overwhelming involvement in behaviours which ultimately prove to be harmful cease to have adaptive functionality, or are at least much less likely to be adaptive. The theory is therefore not solely concerned with external stressors and associated responses (although these may play a role in addictions), but importantly also refers to the *qualitative nature* of an ongoing relationship to the self and to social life more broadly.

If the addict is to be restored to social context as Levy (2013) argues for, and if addictive social dynamics are becoming characteristic of a globalizing world (Alexander, 2008; Sussman et al., 2011), then it can be seen that clinical solutions are limited to intervention in a certain subset of the problem. For Takiwasi, this relationship is depicted in Figure 8.1, which highlights the individualized intervention without erasing the sociocultural context from analysis. As described in chapter 2, Bruce Alexander's concept of psychosocial dislocation, being underpinned by the general process of system-lifeworld colonization which Habermas describes, is suggested to produce sociocultural environments which increase the probability of either material or existential impoverishment. In this context the indigenous characteristics of Takiwasi's treatment give rise to interesting analyses regarding the system-lifeworld relationship to addiction.

Society as sorcery

The sociological analyses to this point have considered addiction in post-industrial societies to be a kind of latent social function (or an unintended negative consequence of social organization). Carried then by the juggernaut of globalization, along with its irresistible economic and technological forces, the generation and proliferation of addictions seem to be nothing less than inevitable outcomes—afflictions that must be tolerated to some degree as a price to pay for our achievements. Indeed, according to Alexander (2008): “Along with dazzling benefits in innovation and productivity, globalisation of free-market society has produced an unprecedented, worldwide collapse of psychosocial integration” (p. 60). As outlined, this collapse leads to existential impoverishment, which makes a fertile psychological ground for addiction in a multiplicity of forms.

In this final section, I suggest that addiction as a generalized latent function of modernity may in fact be a forerunner of addiction as a manifest function (i.e., an intended consequence that is perceived as beneficial). That is, that addiction is a metaphor for the social state resulting from the spirit of domination as fully realized at the terminus of objectifying Enlightenment thought. Humanity, who sought freedom from religious and magical thinking through the application of sceptical reason towards technical mastery over the natural world, is increasingly left without recourse to existential purpose or moral reservoir due to the very process that frees it from tradition (Horkheimer & Adorno, 2002b).

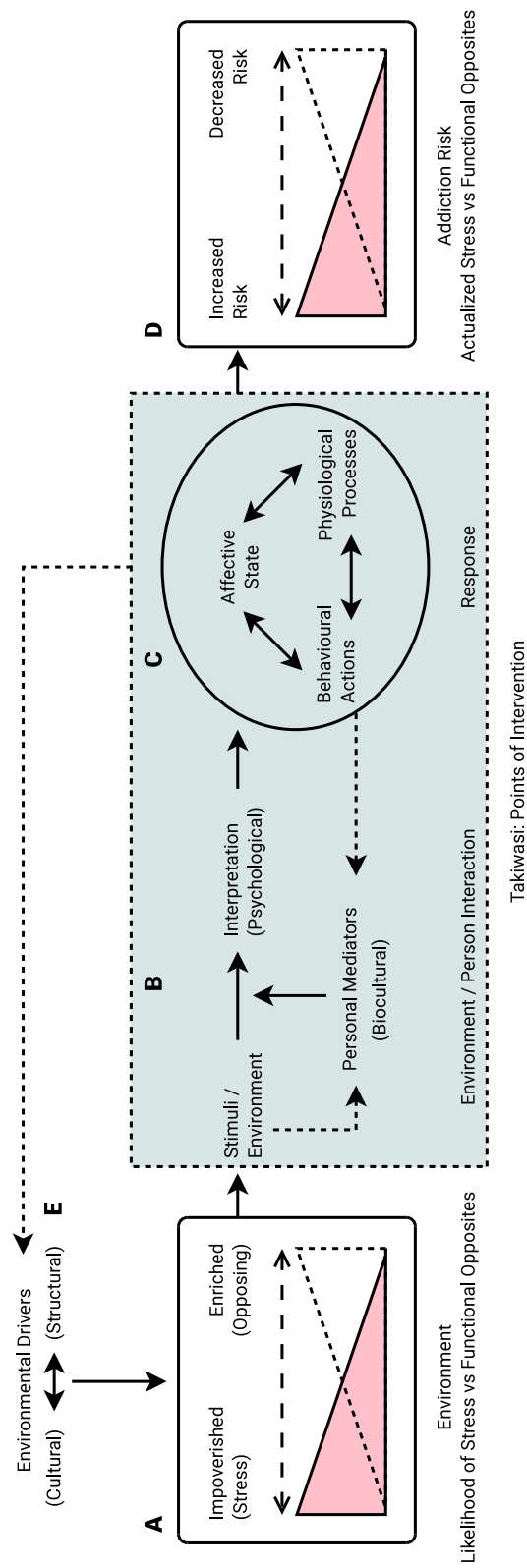


Figure 8.1
BPS addiction and stress model: Takiwasi

But dominion over nature contains a more fundamental flaw in the mistaken categorization of humanity as being separated *from* the natural world (i.e., that the dominating force is fundamentally differentiated from its object of control). Thus, the ever-increasing perfection of technical domination over the natural and social world becomes, at its logical extreme, indistinguishable from self-domination. In Habermas' terms, this would be described as the total dominion of system over lifeworld; an outcome that could only be conceived of along with extreme biotechnical engineering:

Fueled by market forces that increasingly reward only those who possess exceptional skills and talents, designer eugenics dispenses with the contingent craft of embodied conception, and it does so, moreover, in a manner that threatens to radically efface the boundary separating the human and the nonhuman (or posthuman). Habermas's fear is that the biotechnological functionalism that compels us to maximize our chances of having "successful offspring" may well end up separating us from our own humanity via a slippery slope that passes from prenatal diagnostic testing and selective implantation of embryos to in vitro gestation, cloning, and—as we approach the threshold dividing humans from cyborgs—behavioral programming. Indeed, extreme biotechnicization of the lifeworld would so fundamentally alter our ontological self-understanding that we would likely lose both our lifeworld and our humanity. (Ingram, 2010, p. 279)

The success and advance of free-market capitalism is enabled by the same desire for the control and manipulation of nature inherent in enlightenment thought. Thus an enlightened pragmatism, conceived of in terms of economic success as innovation and survival, cannot in the end draw a distinction between the substance of the natural world and the substance of humanity (with all matter and relationships being equalized via their description as mathematical property). The incursion into and modification of the human body is thereby rationalized via system imperatives, and today's comparatively crude methods of influence such as advertising (and more generally the socially interested production of media and information) logically evolve into direct neural manipulation via technology so as to be unhindered by the impediments of thought. As Horkheimer and Adorno (2002b) put it: "Thought is reified as an autonomous, automatic process, aping the machine it has itself produced, so that it can finally be replaced by the machine" (p. 19).

In a perfectly controlled lifeworld,¹⁷ the very possibility of creative or critical thought is extinguished by definition (with the project of rational control over

¹⁷Perhaps only a theoretical possibility at least until all parts constituting the system (i.e., the material reproduction of society) can be autonomously and sustainably driven by highly advanced "strong" artificial intelligence, along with the aforementioned extreme biotechnical engineering.

“nature” then being finalized), which approaches Hannah Arendt’s description of the model citizen in a totalitarian state:

Pavlov’s dog, the human specimen reduced to the most elementary reactions, the bundle of reactions that can always be liquidated and replaced by other bundles of reactions that behave in exactly the same way, is the model “citizen” of a totalitarian state; and such a citizen can be produced only imperfectly outside of the camps. (Arendt, 2000, p. 136)

The difference between this abject condition that Arendt describes (in a depiction of the function of Nazi death camps) is that the unforeseen totalitarianism resulting from perfected dominion over nature is not likely to be forcefully and brutally imposed, but rather to be rationally selected. Indeed, the extreme biotechnicization that aims for functional success could just as well be applied to purposes of entertainment, distraction, pleasure, and fantasy. At present, addiction as a social function represents an adaptation to an ongoing process, but addiction on a grand scale (as a fundamental lifeworld description) is a metaphor for the domination of humanity (as mere matter) by its own creation—the wilful ceding of the very essence of that which is human.

The diffusion of power throughout modern society acts like an abstract or invisible force that compels and replicates a logic of control, with the diversification and multiplication of its surface forms constituting the limits of the ideal of freedom. The instinct for survival drives the material reproduction of the system, while the instinct for pleasure can enable the willing colonization of the lifeworld, making the most sophisticated form of colonization a seduction where the subject assents to the atrophy of culture and meaning in exchange for power over nature and the conditions of life. Although it is already known that the colonial destruction of indigenous culture leads to addictions (see chapter 2), the domination process is continuous and returns to impress itself upon modernity: “When stripped of their ideological veils, the imperatives of autonomous subsystems make their way into the lifeworld from the outside—like colonial masters coming into a tribal society—and force a process of assimilation upon it” (Habermas, 1987, p. 355).

In the introduction to *Mysteries of the Jaguar Shamans of the Northwest Amazon*, Wright (2013) describes the last remaining jaguar shaman of the Baniwa people (Mandu) and his concerns for his people’s traditions, specifically regarding shamanism:

His prophetic message is perhaps best exemplified in *The Warnings of Mandu* (2008). This Venezuelan film shows what has happened to indigenous communities of the upper Guainia River who have lost their shamanic traditions or whose shamans were manipulated by nonindigenous political interests. The result has been, in Mandu’s

words, “domination by the enemy,” a catastrophic situation foretold in the sacred stories shared by many Arawak-speaking peoples of the region. (p. 2)

The assimilation and subsequent enlightenment of so-called primitive cultures under globalization impels, over time, the erasure of traditional beliefs and practices regarding magic, religion, cosmology, and so on.¹⁸ Even if enlightened reason does not allow it internally, from the outside part of the self-destructive logic that Horkheimer and Adorno (2002a) identified as the “dialectic of enlightenment” might very well be construed as a kind of sorcery itself—or a malevolent spirit inside the modern project which leads to “domination by the enemy”. Although the social function of shamanism is so often construed in terms of power relations, the crucial transition that occurs for the conditions of domination is the movement away from a shamanistic concern regarding communicative relations with the natural world (including spirits and so forth), to a utilitarian view of all nature as inert matter to be controlled. The former view contains within it the potential for philosophical and interpretative plurality (e.g., concerning morality and the place of humanity in the balance of the natural world and cosmos), whereas the latter contains a singular revelation: That the world is inherently meaningless and its history is a linear progression towards the perfection of knowledge and control over it (i.e., power over the natural and social world).

8.4 Conclusion

The preceding discussion of addiction has delineated an apparently intractable situation which traces back to the roots of modernity, but even worse, one which may intensify to dystopian proportions in an apparently rational manner. From this perspective, the narrow technical specializations that drive scientific and biomedical research (where productions might be comfortably aimed at profitable diffusion into a market economy of growing inequality) appear inadequate to even properly conceive of the problem. Indeed, while the goal of individual treatment may be laudable, biomedical interventions en masse have the capacity to conceal the outward expression of deeper sociocultural pathology (e.g., drawing comparison to the soma of Huxley’s *Brave New World*). It seems that fully grasping addiction as a biopsychosocial phenomenon in a rapidly globalizing world calls for nothing less than a “global transformation in world view” (Alexander, 2008, p. 392).

¹⁸But this is not to say that there are no grounds for social struggle: “[Globalization] provokes a constant crisis that repoliticizes people and thereby corrects against tendencies that otherwise favor an ‘unconstitutional’ flow of power. Habermas observes that threats to the ‘grammar of the lifeworld’ caused by global warming, human migration, destruction of environment and tradition, commodification of culture, and so on have galvanized the formation of new social movements that, unlike earlier civil rights and labor movements, seek to change or conserve ways of life rather than merely fight for distributive justice” (Ingram, 2010, p. 285).

Apart from the potential mechanisms for individual healing that were outlined earlier in this chapter, the study of Takiwasi can offer a deeper commentary on at least one agent of world view transformation; although it will be helpful first to revisit Mabit's social-spiritual theory of addiction:

Drug addiction represents a symptom of collective illness in a society of desacralized consumption where material reductionism and rationalism ignores the needs and aspirations of humans for a transcendental dimension. The "addict" reveals, in a spectacular manner, the addictive behavior that constitutes a fundamental characteristic of the collective psychic substrate of our society and unmasks the contradictions hidden in the artificial search for happiness externally, rather than within. (J. Mabit, 2007, p. 90)

Put in terms of the system-lifeworld dichotomy, the "collective psychic substrate" of society and the experience of transcendence belong firmly to the domain of lifeworld—they are inherently subjective and meaningful phenomena that cannot be understood in any objectifying sense. As attested to in chapter 5, the experiences with plants in Takiwasi suggest a process that is profoundly concerned with the lifeworld and its revitalization. This is not a theoretical possibility, but a practical matter that involves access to deep structures of meaning invoked in a literal fusion with nature. Drawing back to the dialectic of enlightenment, Takiwasi's programme can be seen to advance a pragmatic resistance against the pure domination of nature—with such logic being challenged by the idea (and indeed, praxis) of a *communicative* relationship with nature and spirit. This very possibility considerably widens the intersubjective scope for a decolonizing communicative action and symbolic reproduction of the lifeworld in real terms. Put simply, the promise lies in an expanded potential for nature as relational possibility, in opposition to nature as mere utility. However, for Takiwasi this promise depends not only on the material integration of indigenous plant technologies, but the symbolic and epistemological integration of traditional relationship towards those technologies as matters of pragmatic concern.

Although the qualitative and quantitative results presented in chapters 4 to 7 are largely positive, the relevance of the Takiwasi treatment for modernity may extend well beyond that which can be inferred from the paradigm of evidence-based medicine. This is not to say that Takiwasi's treatment is a panacea for either addiction or the ills of modernity—it is not. Nor is the claim a defence of ayahuasca or other indigenous plant technologies as freestanding objects of beneficence—history and experience demonstrate this to be false. However, the study of Takiwasi does provide impetus for a deeper and more critical understanding of the world in which we live and its relation to addiction, and at the same time, a clear challenge to the idea that the progress of an objective science is sufficient for an understanding of medical possibility in the world.

Appendices

Psychological

A.1 ASI Composite Scores: Adjustment by Purchasing Power Parity

Certain composite scores of the Addiction Severity Index (ASI; McLellan et al., 2006) are influenced by calculations made on monetary values.¹ While the ASI composite score calculation method makes these scores reasonably insensitive to very large differences, inaccuracies are unavoidably introduced in an international setting where the real values of national currencies can fluctuate widely.

For instance, the real value of a currency affected by high levels of monetary inflation will not be equivalent to the real value of a currency without such influences. The first possible solution is to ignore the problem (letting the ASI composite score calculation smooth out any great differences), although this is imprecise. The second possibility is to perform a currency conversion based on current exchange rates. At the time of writing, a conversion from \$50,000 Chilean pesos (CLP) to United States dollars (USD) resulted in approximately \$75 USD. The problem with this solution is that it does not yield values with equivalent local purchasing power. In other words, the real value of \$50,000 CLP (in Chile) is not necessarily equivalent to the real value of \$75 USD (in the United States).

Therefore the third (and probably most accurate) approach is to convert local currencies to a standard value via purchasing power parity (PPP; Officer, 1976) figures from the World Bank. This method attempts to convert the local currency into its equivalent purchasing power in *international dollars*, which effectively translates the local currency's purchasing power into an equivalent United States purchasing power in USD.² In the case of \$50,000 CLP, the PPP calculation yields approximately \$144 USD. In practice, ASI composite score differences between an exchange rate currency conversion and a PPP conversion are minimal,

¹That is, the composite scores for employment problems, alcohol use, and legal issues. The specific interview items affected are E12, D23, and E17.

²From the World Bank: "An international dollar would buy in the cited country a comparable amount of goods and services a U.S. dollar would buy in the United States" (World Bank, n.d.).

although both are often an improvement over performing the calculations on local currency values.

The actual PPP calculation is uncomplicated, and consists of simply dividing the local currency value by the country-specific (and possibly commodity-specific) PPP figure. The precise values that were used for ASI composite score calculation are provided in Table A.1 (and were sourced online; World Bank, 2011). To follow the previous example, an expenditure of \$50,000 CLP would be converted as:

$$\frac{\$50,000 \text{ CLP}}{348.02} = \$143.67 \text{ USD}$$

Table A.1
Purchasing Power Parity values

Country	PPP (GDP ^a)	PPP (Alcohol ^b)
Colombia	1,161.91	1,193.26
Chile	348.02	362.50
Mexico	7.67	7.83
Argentina	2.66	
Peru	1.52	1.59
Brazil	1.47	1.18
Switzerland	1.44	1.04
Canada	1.24	1.49
USA	1.00	1.00
France	0.85	0.72
Belgium	0.84	0.66
Germany	0.78	0.63
Spain	0.71	0.58
UK	0.70	0.90

^aGross Domestic Product. ^bAs alcohol-specific PPP values were available (except for Argentina), they were used instead of GDP when converting values for ASI item D23 (i.e., “How much money did you spend in the last 30 days on alcohol?”).

A.2 CEQ-F (Spanish) Items

The following is the translated version of the Craving Experience Questionnaire–Frequency (CEQ-F; May et al., 2014) that was used with Takiwasi patients. In some cases the English version was preferred, and those test items can be found in the original CEQ-F publication (May et al., 2014).

Instructions Quisiéramos estimar la frecuencia en la que usted ha tenido el deseo o las ganas de consumir durante el mes pasado. Por favor responda con

qué frecuencia las siguientes cosas han sucedido durante el último mes (30 días). *Marque con una X en la casilla que corresponda al puntaje que usted considere adecuado a cada pregunta* [with a visual scale of boxes ranging from 0 (*nunca*) to 10 (*constantemente*)].

Items ¿Durante el último mes, con qué frecuencia...

1. ... has querido/deseado consumir?
2. ... has sentido la necesidad de consumir?
3. ... has tenido el fuerte impulso de consumir?
4. ... te has imaginado consumir?
5. ... te has imaginado su sabor?
6. ... te has imaginado su olor?
7. ... te has imaginado como se sentiría en la boca?
8. ... has intentado no pensar en el consumo?
9. ... te han invadido los pensamientos sobre el consumo?
10. ... ha sido difícil pensar en otra cosa?

Software List

This thesis was developed on Slackware GNU/Linux, and it would have been far more difficult to complete without the software listed below (although it is by no means a comprehensive record). I am particularly grateful to those software developers who can be counted as part of the free software community.

- Writing and coding: GNU Emacs (especially with ESS, AUCT_EX, and polymode).
- Statistics with R:
 - Code and data manipulation: knitr, dplyr, reshape2, lubridate, and RMySQL.
 - Plotting and graphics: ggplot2, grid, gridExtra, and RColorBrewer.
 - Analyses: lme4, lmerTest, effects, psych, effsize, influence.ME, and MuMIn.
- Document typesetting (T_EX Live 2017): X_EL_AT_EX, memoir, siunitx, hyperref, and microtype (amongst others). PDF/A conversion performed with Qoppa PDF Studio Pro.
- Referencing: JabRef, Zotero, ivy-bibtex (Emacs), and Bib_EL_AT_EX (with biblatex-apa).
- Virtualization: VirtualBox (Windows 7 guest).
- Transcription and qualitative data analysis: f4transkript and MAXQDA.
- Data entry, management, and test scoring: LibreOffice Calc and QualityMetric Health Outcomes Scoring Software (for SF-36v2).
- Dictionary and document search: GoldenDict and Recoll.
- Backup: BorgBackup.

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