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**PHOBIC DISORDER,  
PSYCHOTHERAPY,  
AND RISK-TAKING:  
AN ECONOMIC PERSPECTIVE**

by  
**Gideon Yaniv**

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**PHOBIC DISORDER, PSYCHOTHERAPY, AND RISK-TAKING:  
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**ABSTRACT**

**Despite the popularity of psychotherapy in the treatment of phobic disorders, there is little scientific evidence supporting its effectiveness. This paper applies the economic tools of rational choice under uncertainty to the analysis of agoraphobia, the most common and disabling of the phobic disorders, with the purpose of gaining more insight not as regards the *cause* of this phobia, but as regards the extent of deviation from normal work behavior (which may still respond to incentives) and the effectiveness of psychotherapy in treating work-avoidance. The paper challenges a popular claim that the high cost of psychotherapy helps ensure its success, arguing that by depleting a patient's financial resources, therapy costs may *discourage* risk-taking, thus acting to undermine the favorable effect of treatment. The perverse effect of therapy costs is shown to be more significant in mild cases of agoraphobia, suggesting that mild disorders may be more effectively treated in public-funded community clinics or through corporate-financed mental health programmes.**

## INTRODUCTION

A *phobia* is an irrational fear resulting in a conscious avoidance of the specific feared object, activity or situation. When the avoidance behavior or fear is a significant source of distress to the individual or interferes with his daily or social functioning, it becomes a *phobic disorder*.<sup>1</sup> The most disabling of the phobic disorders (and the most commonly cited of those who seek psychiatric or psychological treatment) is *agoraphobia*, which is the fear of being alone in public places from which escape might be difficult or help not available in case of sudden incapacitation, such as busy streets, crowded stores, closed-in spaces (tunnels, bridges, elevators) and closed-in vehicles (subways, buses, airplanes).<sup>2</sup> Unaccompanied (by friends or relatives) travelling or passing through public places might provoke an episode of acute *anxiety*,<sup>3</sup> associated with dramatic physiological, cognitive and emotional symptoms, known as *panic attack*.<sup>4</sup> During an attack, one often attempts to escape whatever situation he or she is in to seek help at home or in an emergency room. While being dismissed by physicians without any finding of an organic problem, recurrences of the frightful event, usually followed by prolonged physical exhaustion, may result in the individual insisting that he or she be accompanied whenever leaving the house, and, in the more severe cases, in refusal to leave the house altogether.<sup>5</sup>

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<sup>1</sup> Unless otherwise cited, the clinical features of the mental disorders described in this paper are based on Kaplan and Sadock (1993) and the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatry Association, 1980).

<sup>2</sup> The term "agoraphobia" is derived from Greek and means "fear of the market place".

<sup>3</sup> As clarified by Beck and Emery (1985), fear involves the intellectual appraisal that there is actual or potential danger in a given situation, whereas anxiety involves the emotional response to that appraisal. When a fear is *activated* (as a result of being exposed, either physically or psychologically, to the stimulus situation considered to be threatening), anxiety takes over.

<sup>4</sup> A panic attack may involve a wide range of physiological symptoms resembling a heart attack (e.g., cold sweating, dizziness, chest pain, shortness of breath, palpitations or accelerated heart rate), accompanied by thoughts of losing control and being humiliated in public and a frightful sensation of impending death (or other catastrophe).

<sup>5</sup> It is now hypothesized that many agoraphobic persons have developed this phobia as a result of a classical conditioning after experiencing a panic attack in a public place.

Unlike *psychotic disorders* (such as schizophrenia or paranoia), which are characterized by thought disturbances, bizarre delusions, hallucinations, and misperception of reality, phobic disorders do not involve a confusion of subjective impressions and experiences with the external reality, thus maintaining one's mental capabilities and solid judgement. Rationality may still be assumed to guide the agoraphobic individual's behavior, subject, however, to his or her irrational fear of public places.<sup>6</sup> This implies that the risky implications of leaving the house for whatever purpose should be weighed against the potential benefits, and, most importantly, that leaving for work (even if work itself is performed in a perfectly safe place) becomes a problem of economic choice under risk: if the (subjective) probability of experiencing a panic attack on the way to work is too high, or the dread and discomfort accompanying an attack is too intense, it may be worth the individual's while to stay at home and forego the workday's earnings. Indeed, time lost from work and the financial difficulties that arise due to loss of work are considered the major socio-economic consequence of agoraphobia.<sup>7</sup> This is far from being a negligible social problem in view of the well-cited Epidemiologic Catchment Area (ECA) Study, sponsored by the National Institute of Mental Health (NIMH), which estimates the *lifetime* prevalence of agoraphobia to range from 5.3 to 12.5 percent of the community population in females and from 1.5 to 5.2 percent in males (lifetime referring to an informant's having had the disorder sometime during the course of his or her life), and the six-month (preceding the interview) prevalence to range from 2.7 to 5.8 percent in women and from 0.9 to 3.4 percent in men.<sup>8</sup>

The agoraphobic work dilemma is not confined, however to an all-or-nothing decision. If

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<sup>6</sup> While the fear of public places is irrational in the sense that it involves the appraisal of high degree of risk in a situation that is relatively safe, avoidance of public places may be rational given that fear.

<sup>7</sup> While it is difficult to assess the magnitude of work loss due to agoraphobia per se, Jansen (1986) claims, citing a United Kingdom report, that during 1974 - 75, 20.2 million working days were lost by men and 9.4 million by women as a result of mental illness, which accounts for 9.5 per cent of working days lost through illness of all kind during this time. Another citing is a three-year study of absenteeism among employees of a major steel company in the United States showing that psychiatric illness accounted for 61 per cent of work absences.

<sup>8</sup> See Robbins et al. (1984) for lifetime prevalence and Weissman et al. (1984) for six-month prevalence. Both of these studies were based on a carefully selected community random sample consisting of over 3,000 informants. See also Monoz (1986) for a summary of these results.

full abstention from work is *not* desirable, there still remains the problem of deciding on how much to work (or on how much work to avoid). The importance of this decision lies beyond the strive for achieving a classical work/leisure optimum (at the point where the marginal rate of substitution in utility equates the price of leisure), since agoraphobic workers face above-average risks of *not being able* to materialize their committed work schedule. Failure to stand by one's commitment due to suffering a panic attack on the way to work (which, for obvious reasons, cannot be disclosed) is costly, not only because it entails the loss of daily earnings, but mainly because it damages the worker's credibility and professional reputation, and might lead to job dismissal (or to loss of clients), as well as to legal claims for compensation in case of a substantial harm to the employer (or clients). Moreover, even if a panic attack does not occur on the way to work, it might still occur on the way *from* work, necessitating rest and recovery at the expense of leisure. Naturally, the costly ramifications of a panic attack (in terms of time and money) increase with the volume of work commitments.

The present paper applies the economic tools of rational choice under uncertainty to the agoraphobic work problem, with the purpose of gaining more insight not as regards the *cause* of the phobic disorder,<sup>9</sup> but as regards the extent of deviation from normal work behavior (which may still respond to incentives) and the effectiveness of psychotherapy in treating work-avoidance. On the one hand, the paper is related to a still small body of literature dealing with economic analyses of psychological phenomena, such as guilt complex [Liebhafsky (1972)], cognitive dissonance [Akerlof and Dickens (1982)], welfare stigma [Moffitt (1983)], addictive behavior [Becker and Murphy (1988)], or job stress [Yaniv (1995)], although, to the best of my knowledge, this is the first time that the economic approach is applied to the analysis of a mental disorder. On the other hand, the paper is related to studies of labor supply under uncertainty, which have, however, focused on *labor market* risks such as wage uncertainty [e.g., Block and Heineke (1973), Cowell (1981), Ravi Kanbur (1983)] or involuntary unemployment, the latter being either exogenous [Hartly and Revankar (1974), Sjoquist (1976), Yaniv (1979, 1982)] or

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<sup>9</sup> For a summary of the theoretical explanations of agoraphobia see Mathews et al. (1981, Ch. 3).



initiated through workers' behavior via deliberate absenteeism [Allen (1980), Leigh (1985), Yaniv (1991)] or complaining about receiving less than the statutory minimum wage [Yaniv 1994)].

The paper begins with a formal description of the agoraphobic worker's environment and preferences, solving the worker's problem to show, *inter alia*, that he or she will tend to spend less time at work (and more time at home) the higher the risk of suffering an attack on the way to/from work. Viewing the work-avoidance effect of agoraphobia as a measure for the severity of the phobic disorder, the paper proceeds to examine the effectiveness of psychotherapy in restoring normal work behavior, focusing on the role of costs in the psychotherapeutic process. The paper challenges a popular claim that the high cost of psychotherapy helps ensure its success, arguing that by depleting a patient's financial resources, psychotherapy costs may serve to *discourage* risk-taking, thus acting to undermine treatment. This could help explain why psychotherapy has proved less successful in treating phobic disorders than self-administered behavior therapy. The perverse effect of therapy costs is further shown to be more significant in mild cases of agoraphobia, suggesting that publicly-funded psychotherapy, usually believed to be of a lower quality than expensive discrete therapy, or corporate-financed mental health programmes, may be more effective in treating mild disorders.

## **THE WORK-AVOIDANCE EFFECT OF AGORAPHOBIA**

Consider an agoraphobic worker who, at the beginning of a given day, must make a binding commitment to her employer (or clients) regarding the number of her working hours,  $k$ , at that particular day. Suppose, however, that the worker lives in the suburbs and works in the city, thus facing the risk of experiencing a panic attack on her way to/from work. Suppose further that the (subjective) probability of a panic attack occurring on either direction is identical and (inversely) dependent on the state of her mental health at that particular day. If, with probability  $1 - p$ , she does not suffer an attack on her way to work, she will successfully stand by her commitment, earning a total of  $w(k)$  per day, where  $w'(k)$

$> 0$  and  $w''(k) \leq 0$ . If, with probability  $p$ , she does suffer an attack, she is bound to return back to her home, where she will rest and recover for  $r$  hours. At that particular day, she will not attempt leaving for work again. Not only will she lose her daily earnings, but she might also incur additional costs of  $z(k)$ , where  $z'(k) > 0$  and  $z''(k) \geq 0$ , for breaking her commitment. If, with probability  $(1 - p)p$ , she suffers an attack on her way *from* work, she will bear no financial loss, but she will still need to recover at home (at the expense of leisure).

Suppose now that the worker's utility,  $U$ , is defined over daily income,  $I$ , and leisure hours,  $L$ , assumed to be spent at home after work. A decision to work thus gives rise to three possible outcomes (in utility terms):  $U(I^p, L^p)$ , if a panic attack occurs on the way to work,  $U(I^q, L^q)$ , if a panic attack occurs on the way from work, and  $U(I^n, L^n)$ , if a panic attack does not occur at all. Obviously,  $I^q = I^n$ . Suppose also that the utility function is strongly separable in income and hours of leisure, so that  $U(I, L) = v(I) + \phi(L)$ . Suppose further that the marginal utility of income is positive and strictly decreasing [i.e.,  $v'(I) > 0$ ,  $v''(I) < 0$ ], so that the worker is risk averse. Separability thus implies that risk aversion is independent of leisure consumption, and that leisure is a superior good. Finally, suppose that the marginal utility of leisure is positive and strictly decreasing as well [i.e.,  $\phi'(L) > 0$ ,  $\phi''(L) < 0$ ].

Assuming now that the worker has  $T$  free-of-sleep hours to be allocated between work and leisure, and an unearned income of size  $N$ , suppose that she chooses her daily work commitment so as to maximize the expected utility of her prospect

$$E(U) = (1 - p)[v(I^n) + \phi(L^n)] + p[v(I^p) + \phi(L^p)], \quad (1)$$

where  $I^n = N + w(k)$ ,  $I^p = N - z(k)$ ,  $L^n = T - k$ ,  $L^p = T - r$ , and  $L^q = T - k - r$ . Differentiating (1) with respect to  $k$  and equating to zero, the first-order condition for an interior optimum is

$$\frac{d[E(U)]}{dk} = (1 - p)[w'(k)v'(I^n) - \phi'(L^n)] - pz'(k)v'(I^p) = 0, \quad (2)$$

which, by rearranging terms and substituting  $\rho = p/(1-p)$ , becomes

$$D \equiv w'(k)v'(I^n) - \phi'(L^n) = \rho z'(k)v'(I^p) + p[\phi'(L^q) - \phi'(L^n)]. \quad (3)$$

In the absence of agoraphobia ( $\rho = p = 0$ ),  $D = 0$  at the optimum, and the model collapses to the classical (deterministic) labor/leisure choice model. The worker's ('normal') supply of labor,  $k^n$ , would then be determined at the point where the marginal rate of substitution between leisure and income [ $\phi'(L^n) / v'(I^n)$ ] equals the marginal return to labor efforts [ $w'(k^n)$ ]. In the presence of agoraphobia,  $D > 0$  at the optimum. Since  $D$  varies inversely with  $k$ ,<sup>10</sup> it follows that agoraphobia results in the supply of less labor,  $k^s$ , than the normal level. The magnitude of deviation from normal work behavior,  $k^n - k^s$ , may thus serve as a measure of the severity of the phobic disorder.<sup>11</sup>

Condition (3) implies that the work-avoidance effect of agoraphobia increases with the probability of experiencing a panic attack on the way to/from work. It also increases with the size (absolute and marginal) of the financial loss borne by the worker in case of not being able to stand by her commitments, as well as with the time needed to recover an attack. Notice that the work-avoidance effect is positive even if the financial loss due to the occurrence of an attack is zero or independent of the volume of work commitments [i.e., even if  $z'(k) = 0$ ]; The possibility that recovery following an attack may be needed even if work has been successfully completed is sufficient to drive the supply of labor below its normal level so as to ensure time for leisure activities.

If for  $k = 0$  condition (3) holds as a weak inequality (where its left terms are equal or lower

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<sup>10</sup>Differentiating  $D$  with respect to  $k$ , we have

$$\frac{dD}{dk} = [w'(k)]^2 v''(I^n) + w''(k)v'(I^n) + \phi''(L^n) < 0.$$

<sup>11</sup> Indeed, one behavioral measure of agoraphobia, although not reflecting its essence directly, is the time a patient spends away from home (until he or she begins to feel uncomfortable or tense). This measure has proved sensitive to the effects of behavioral treatment in studies conducted by Emmelkamp et al. (1978).



than its right terms), the worker would avoid work altogether (as increasing  $k$  would only sharpen the inequality). Rearranging terms (evaluated at  $k = 0$ ), the non-working condition becomes

$$w'(0) \leq \frac{(1-p)\phi'(T) + p\phi'(T-r)}{v'(N)} + \rho z'(0), \quad (4)$$

the right-hand-side terms representing the worker's risk-adjusted reservation wage. Clearly, agoraphobia raises the worker's reservation wage above its normal level,  $\phi'(T) / v'(N)$ , the rise being an increasing function of  $p$ . A sufficiently high value of  $p$  may push the risk-adjusted reservation wage above the marginal return to labor,  $w'(0)$ , inducing the worker to stay at home and forego her work earnings.

## PSYCHOTHERAPY AND WORK-AVOIDANCE

Suppose now that the worker seeks psychiatric help to treat her phobic disorder. Suppose also that psychiatric treatment improves mental health, thus reducing the risk of experiencing a panic attack on the way to/from work.<sup>12</sup> Suppose further that the daily intensity of psychotherapy is restricted to the standard (50 minutes) session, and that the improvement in mental health is positively related to the quality of treatment, signaled, by assumption, by the therapist's stock of therapeutic resources (reflected through his education level and professional experience),  $S$ . Hence,  $p = p(S)$ , where  $p'(S) < 0$ . Finally, suppose that psychotherapy may be provided before leaving for work and that it is held at a close vicinity to the worker's residence, which can easily be reached by foot.

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<sup>12</sup> As explained by Mathews et al. (1981, pp. 63-4), the central idea in the psychoanalytic view of agoraphobia is that the symptoms are the result of two processes: the repression of an emotionally charged idea (or an inner threat) of which the patient is unaware of, and the displacement of this internal conflict to a dangerous situation in the outside world against which he can protect himself. Analytical treatment is supposed, first, to uncover the repressed mental contents that account for agoraphobia, and second, to enable the patient to deal with these directly so that the defenses of repression and displacement can be given up.

A glance at condition (3) reveals that if psychiatric treatment were provided free of charge (as is the case, for example, with public-funded clinics), engaging in psychotherapy, whatever its quality, would unambiguously reduce the work-avoidance effect of agoraphobia (through reducing the risk associated with travelling to work).<sup>13</sup> Suppose, however, that the worker faces a market price,  $\pi$ , per unit of therapeutic capital employed over a standard session of psychotherapy. The cost of psychotherapy,  $\pi S$ , would then decrease  $I^n$  and  $I^p$  [thus increasing  $v'(I^n)$  and  $v'(I^p)$ ], acting to obscure this straightforward conclusion. To further inquire into the role of costs in the treatment of agoraphobia, suppose now that all therapists available at the worker's neighbourhood possess an identical stock of therapeutic resources,  $S_0$ , which, although not necessarily the stock preferred by the worker, is still desirable at a wide range of sufficiently low prices.<sup>14</sup> Thus, a price increase within this range of prices would not induce the worker to give up therapy (nor would it enable her to switch to a less resourceful therapist). Substituting  $I^n = N + w(k) - \pi S$  and  $I^p = N - z(k) - \pi S$  into (2), and totally differentiating (2) with respect to  $k$  and  $\pi$ , we obtain

$$\frac{dk^s}{d\pi} = - \frac{w'(k)p(S)v'(I^n)R_A(I^n)S}{\Omega} \left[ \frac{1}{\rho(S)} - \varepsilon(k, \pi S) \right], \quad (5)$$

where  $R_A(I) \equiv -v''(I)/v'(I) > 0$  is the Arrow-Pratt absolute risk-aversion measure,  $\varepsilon(k, \pi S) \equiv z'(k)v'(I^p)R_A(I^p)/w'(k)v'(I^n)R_A(I^n)$ , and  $\Omega < 0$  is the second-order condition for the maximization of expected utility.<sup>15</sup> Obviously,  $dk^s/d\pi \geq 0$  if  $\varepsilon(k, \pi S) \leq 1/\rho(S)$ .

Condition (2) implies that  $(1-p)w'(k)v'(I^n) - pz'(k)v'(I^p) > 0$  at the optimum, or that  $z'(k)v'(I^p)/w'(k)v'(I^n) < 1/\rho(S)$ . However, under the accepted assumption of decreasing

<sup>13</sup> The effect on leisure of psychotherapy time (the same as the effect of travel time to work) is ignored (assumed to be negligible).

<sup>14</sup> That is, the overall benefit of therapy at that range of prices still exceeds its overall cost.

<sup>15</sup> See next page.

absolute risk-aversion,  $R_A(I^P) / R_A(I^n) > 1$ . Hence, the sign of (5) is, at first glance, ambiguous. The reason for this ambiguity is that the economic analysis of agoraphobia combines the classical work/leisure choice model with the classical portfolio problem, safe leisure and risky work playing the role of safe and risky assets in the latter. An increase in the cost of psychotherapy generates, in the time allocation model, a negative income effect on leisure (given, as assumed, that leisure is a superior good), driving the worker to *increase* her work commitments (which helps finance the cost of therapy). On the other hand, an increase in costs, by depleting the worker's financial resources, tends, in portfolio theory, to discourage risk-taking, thus *reducing* work commitments.<sup>16</sup> Psychotherapy costs thus generate two opposing income effects on work-avoidance.

The possible relationship between the cost of treatment and its outcome has been a subject of interest to psychologists ever since Sigmund Freud (1913/1958), who suggested that the payment of a fee to the therapist may contribute to the success of the treatment.<sup>17</sup> The commonly held view, based on a cognitive-dissonance argument, is that clients who pay a fee may try harder during therapy in order to justify their financial commitments [Davis (1964)]. Empirical and experimental studies [e.g., Pope et al. (1975), Yoken and Berman (1984)], however, do not seem to support the hypothesis that paying a fee enhances the effectiveness of psychotherapy. Moreover, despite its popularity in the

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<sup>15</sup> The second-order condition is

$$\frac{d^2[E(U)]}{dk^2} \equiv \Omega = (1-p)\{w''(k)v'(I^n) + [w'(k)]^2 v''(I^n) + (1-p)\phi''(L^n) + p\phi''(L^q)\} \\ - p\{z''(k)v'(I^p) - [z'(k)]^2 v''(I^p)\} < 0, \quad (2')$$

satisfied by the assumptions on the utility function and the earning and loss functions.

<sup>16</sup> Notice that in a pure portfolio model,  $z'(k)v'(I^p) / w'(k)v'(I^n)$  would equal  $1/\rho$  at the optimum, implying, given decreasing absolute risk aversion, that the sign of (5) is unambiguously negative.

<sup>17</sup> In Freud's words: "the value of the treatment is not enhanced in the patient's eye if a very low fee is asked..... The absence of the regulating effect offered by the payment of a fee makes itself very painfully felt; the whole relationship is removed from the real world, and the patient is deprived of a strong motive for endeavoring to bring the treatment to an end" (pp. 131-132).

treatment of phobic disorders, there is little scientific evidence supporting the effectiveness of psychotherapy in these conditions, and much evidence conclusively proving the effectiveness of self-administered behavior therapy [Griest et al. (1986)].<sup>18</sup> The discouraging effect of psychotherapy costs on risk-taking identified through equation (5) may help explain why psychotherapy has proven less successful.

Equation (5) embodies, however, an additional interesting implication. Notice that  $\varepsilon(k, \pi S)$  increases with  $k$ . Notice also that at  $k = 0$ ,  $I^n = I^p$ , thus  $\varepsilon(0, \pi S) = z'(0) / w'(0)$ . Assuming that  $z'(0) \rightarrow 0$  and  $w'(0) \rightarrow \infty$ ,  $\varepsilon(0, \pi S)$  is bound to be smaller than  $1 / \rho(S)$ . Hence,  $dk^s/d\pi > 0$  at  $k = 0$ . As  $k$  increases, so does  $\varepsilon(k, \pi S)$ . For sufficiently high levels of  $k$ ,  $\varepsilon(k, \pi S)$  will exceed  $1 / \rho(S)$ , implying that  $dk^s/d\pi < 0$ .

The conclusion is straightforward: in severe cases of agoraphobia (particularly when the worker avoids work altogether), the cost of psychotherapy has a moderating effect on work-avoidance, strengthening the favorable effect of treatment per se.<sup>19</sup> However, in less severe cases, the cost of psychotherapy might encourage work-avoidance, counteracting the favorable effect of treatment. Costly psychotherapy might then aggravate the phobic disorder. A practical implication of this conclusion is that in mild cases of agoraphobia, public-funded therapy, offered to low-means individuals in community clinics, may be more effective in the treatment of work-avoidance even if it is provided by less resourceful therapists than those engaging in private practice. The same applies to corporate-financed mental health programmes, aimed at avoiding loss of investment in skilled workers who have been developing emotional or mental problems.<sup>20</sup>

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<sup>18</sup> Unlike psychotherapy, behavior therapy does not assume that phobias are symbolic transformations of hidden difficulties. Instead, it regards the phobia itself as the main handicap and tries to eliminate it directly - not by uncovering unconscious meanings, but by a gradual exposure to the feared object or situation, which may be carried out by the patient as homework assignments (suggested by a therapist or a self-help instruction manual). While behavior therapy has almost no therapist costs, many patients are unable or unwilling to invest the time and effort necessary to ensure a successful outcome, and others do not have access to adequately trained behavior therapists.

<sup>19</sup> Since severely disordered patients are likely to be treated with complementary heavy medication, they may not be captured by empirical evidence relating to the effectiveness of psychotherapy per se.

<sup>20</sup> For a review of such programmes in the United States See Jansen (1986).



Aside of playing a role of its own in the psychotherapeutic process, the price of therapy may be crucial in deciding on three interrelated features of psychotherapy: the frequency of (as well as the number of missed ) appointments, the length of treatment and the choice of therapist. While the first two features relate to dynamic aspects of treatment which lie beyond the scope of this paper, it is interesting to examine how the choice of therapist affects work-avoidance. Suppose then that the worker's neighborhood is abundant with therapists who differ in their therapeutic resources. The worker may thus choose the level of  $S$  which maximizes her expected utility. The first-order condition for an interior optimum (given  $k^B$ ) is

$$\frac{d[E(U)]}{dS} = -\pi \{ [1-p(S)]v'(I^n) + p(S)v'(I^p) \} - p'(S)[v(I^n) - v(I^p) + \Gamma] = 0, \quad (6)$$

where  $\Gamma \equiv 2[1-p(S)]\phi(L^n) - [1-2p(S)]\phi(L^q) - \phi(L^p) > 0$ .<sup>21</sup> This requires, in utility terms, that the marginal cost of psychotherapy,  $\pi E v'(I)$ , equals its marginal benefit,  $-p'(S)[v(I^n) - v(I^p) + \Gamma]$ , both increasing in  $\pi$ . Hence, the relationship between  $S$  and  $\pi$  is not self-evident. Totally differentiating (6) with respect to  $S$  and  $\pi$ , we obtain

$$\frac{dS}{d\pi} = - \frac{S \{ \pi [E v''(I)] - p'(S)[v'(I^p) - v'(I^n)] \} - E v'(I)}{\pi \{ \pi [E v''(I)] - 2p'(S)[v'(I^p) - v'(I^n)] \}}, \quad (7)$$

the denominator of which representing the second-order derivative of expected utility with respect to  $S$  (assuming, for simplicity, that  $p''(S) = 0$ ), which must be negative at the optimum. This implies that the numerator (without the minus sign) is also negative at the optimum, as well as the sign of (6). Hence, the higher the price of psychotherapy, the less resourceful is the preferred therapist.

Suppose now that  $\pi_0$  is the price of  $S$  for which  $S_0$  is optimal, and consider the worker's reaction to an increase in  $\pi$  above  $\pi_0$ . Rather than choosing  $S_0$ , the worker would choose

<sup>21</sup> If  $L^n = L^p = L^q$ ,  $\Gamma = 0$ . Since  $L^n > L^p > L^q$ ,  $\Gamma$  must be positive.

a lower  $S$ , which corresponds to a higher value of  $\rho(S)$ . Condition (3) implies that  $D$  should be greater at the optimum, increasing the work-avoidance effect of agoraphobia. Moreover, equation (6) implies that  $\varepsilon(k, \pi S)$  is more likely to exceed  $1/\rho(S)$ , and  $dk^8/d\pi < 0$ . On the other hand, equation (6) reveals that the elasticity of  $S$  with respect to  $\pi$  is (in absolute terms) less than unity, implying that the higher the price of psychotherapy, the higher will be its total cost,  $\pi S$ .<sup>22</sup> This will lower  $I^n$  and  $I^p$ , increasing both the numerator and denominator of  $\varepsilon(k, \pi S)$ . The effect on  $\varepsilon(k, \pi S)$  is thus ambiguous, depending on third-order derivatives of  $v(I)$ . Given that  $\varepsilon(k, \pi S)$  increases (or does not change) with  $\pi S$ , the worker's ability to choose her preferred therapist will unambiguously increase the likelihood of the perverse effect of therapy costs dominating at any given  $k^8$ . The frequently applied logarithmic utility function satisfies, for instance, this requirement.<sup>23</sup>

## CONCLUDING REMARKS

Phobic disorders are receiving much attention in psychiatric practice today because they are common, they are disabling, and they are treatable [Munoz (1986), p. 3]. Agoraphobia, the most common of the phobic disorders, involves the risk of experiencing a panic attack in public places, thus disabling the worker from fully participating in the labor market. Applying the economic approach of rational choice under uncertainty to analyzing the work-avoidance effect of agoraphobia, the present paper has argued that while psychotherapy reduces the risk of suffering an attack on the way to/from work, the cost of therapy reduces the tendency to take risks, thus counteracting the favorable effect of treatment. The perverse effect of therapy costs has been shown to be more

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<sup>22</sup> Differentiating  $\pi S$  with respect to  $\pi$  yields

$$\frac{d(\pi S)}{d\pi} = S + \pi \frac{dS}{d\pi} = \frac{S p'(S)[v'(I^p) - v'(I^n)] - E v'(I)}{\pi [E v''(I)] - 2 p'(S)[v'(I^p) - v'(I^n)]} > 0. \quad (7')$$

<sup>23</sup> Under the logarithmic utility function,  $v(I) = \ln I$ ,  $\varepsilon(k, \pi S) = z'(k)(I^n)^2 / w'(k)(I^p)^2$ . Hence,  $d[\varepsilon(k, \pi S)] / d(\pi S) = 2\varepsilon(k, \pi S)(I^n - I^p) / I^n I^p > 0$ .

significant in mild cases of agoraphobia, implying that mild disorders may be more effectively treated in public-funded community clinics or through corporate-financed mental health programmes. Both, however, involve disclosure of privacy and give rise to stigma associated with mental disorders. The growing awareness in recent years of the high prevalence of mental disorders among members of the labor force may serve to reduce stigma and help increase the attractiveness of non-costly therapy channels.<sup>24</sup>

Economics cannot explain the *cause* of mental disorders. It may, however help explain the *extent* of abnormal behavior when the mental disorder involves decision under (unrealistic or excessive) risk, since risk-avoidance (or risk-taking) may still respond to economic incentives. Phobias are not the only mental disorder to which economic analysis may be applied. *Obsessive-Compulsive* disorder, characterised by compulsive rituals designed to produce or prevent some future event or situation, is another one. The repetitive behavior, however, is not connected in a realistic way with what it is designed to produce or prevent, or is clearly excessive.<sup>25</sup> Doors and windows, for example, are locked and relocked or gas and water taps are turned off again and again (even though they are visibly shut off), until a sense of safety is achieved. Psychotherapy aims at moderating the abnormal behavior (which is a source of discomfort to the patient and a major waste of time) by diminishing the risk to property associated with not completing the ritual to its very end. Economics suggests that the cost of treatment, by discouraging risk-taking, might encourage repetition.

While psychotherapy improves mental health, it is not likely to *cure* the worker in a single session. Successful psychotherapy may require a series of (consecutive or intermittent) daily meetings, and the model could be extended to take account of dynamic features of psychotherapy, such as the duration of treatment, the intensity of weekly meetings (which

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<sup>24</sup> Jansen (1986) reports, citing US Department of Health and Human Services publications, that in the United States three million people suffer severe mental disorder annually, 2.4 million of whom become moderately to severely disabled on account of the disorder.

<sup>25</sup> Obsessive-compulsive disorders are said to occur in about 1 percent of the adult population, but they are quite severe in many cases and often interfere greatly with the person's functioning.

may rise or fall over time), and its preferred complementation with drugs or behavior therapy. Griest et al. (1986) report, however, that many patients with phobic and obsessive-compulsive disorders have received psychoanalytic or psychodynamic treatment over a period of many years without relief of distress or improvement in functioning, concluding that "although psychoanalysts are sincere in their attempt to help people with anxiety disorders, psychoanalysis is an unnecessarily lengthy and expensive way to persuade people to face the things they fear" (p. 120). As this paper suggests, expenses may have played an active role in reaching this conclusion.



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