Self-Esteem and Labour Market Choices

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Abstract

We assume that people have beliefs about their abilities, that these generate self-esteem, and that self-esteem is valued intrinsically. We consider the implications for an individual’s incentive to manage their self-esteem in the labour market. Employing a model of labour market search with Bayesian updating, we show that a self-esteem sensitive individual has an incentive to avoid the situation (in avoiding the truth), self-handicap (in avoiding the truth without avoiding search), to employ downward comparison (in manipulating the truth), and engage in defensive pessimism (in avoiding materially damaging strategies like self-handicapping). We then consider some policy implications in regard to discouraged workers, minimum wages, and unemployment insurance.

1 Introduction

Social psychologists believe that we can not understand individual behavior without first having an understanding of self-esteem (see Leary and Tangney (2003)). The focus of this paper will be to model an individual whose well being depends directly on self-esteem. A modern view (see Crocker and Park (2003, p. 291)) with its origins in the seminal work of James (1890), is that an individual’s self-esteem is based on a trait or endowment level of self-esteem and
then components which are contingent on the individual’s dynamic self evaluation of their qualities or abilities on a number of distinct domains. Examples of potentially important domains are physical appearance, academic competence, career competence, power, having love of family, love of god, and virtue. They argue that people seek to maintain, enhance, and protect their self-esteem.

Traditionally there has not been a lot of research in economics into the idea that self-esteem may be important in understanding individual economic behaviour. The reason for this is surely related to the traditional assumption in economics that an individual’s quality or ability on a domain would be perfectly known by the individual and thus there would be no need for, or economic consequence from, a dynamic self-evaluation. While psychologists have argued that self-esteem should be viewed as a realistic evaluation of oneself (see Mruk (1995)), the notion that we could know ourselves with certainty would be foreign to psychologists and would in fact be inconsistent with many experimental results. One’s opinion of oneself could serve as the definition of a subjective opinion. A moment of introspection makes it clear that we rely a great deal on the opinions and behaviour of others in forming our view of ourselves. It is also clear that when psychologists argue for the central role of self-esteem in the problems of our society it is not because of its indirect effects on behaviour, it is because of its direct effect on individual well-being. So we assume that an individual’s belief about herself/himself directly affects the well-being of that individual.

We are not the first in economics to assume individuals have preferences over their beliefs. Akerlof and Dickens (1982) model of dissonance reduction involves individuals with a hedonic concern for self-image and thus preferences over beliefs. Related literature are Rabin (1995) and Rabin and Schrag (1999).

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1 See Mruk (1995) for a chapter on definitions alone.
More recently the literature has been expanding rapidly. Likely the two most closely related published papers to our work are Benabou and Tirole (2002a, and 2002b). Building on Carillo and Marrotti (2000), Benabou and Tirole (2002a) consider an individual facing the choice of undertaking costly effort on a task with a probability of success given by their effort and their uncertain ability and who has quasi-hyperbolic discounting in their preferences (salience of the present). The latter induces time inconsistency in that the self at time 0 would view the self at time 1 undertaking too little effort. Now imagine that self 0 has information regarding ability and access to a technology which allows the individual to forget the information with positive probability. Then self 0 would have the incentive and potential means to induce over-confidence in self 1 in generating motivation. But the authors go further and allow self 1 to understand the incentive of self 0 to manipulate memory and thus to know that its memories are potentially unreliable. This induces a non-cooperative game between the selves and generates many interesting results whereby there are equilibria with partially repressive equilibria, the possibility of self-handicapping (see below), and an individual (both selves) who does not do as well as possible for his/herself given preferences, endowments, and potential access to information.\textsuperscript{2} A difference in our work is our intention to attempt a more narrow focus on self-esteem rather than self confidence/self-esteem as in Benabou and Tirole and our work does differ in a number of technical ways, for example, rather than employing time inconsistency and thus a motivation based intrapersonal incentive for the manipulation of beliefs about the self we will simply assume that hedonic utility is increasing in self-esteem. Never the less our paper may best be thought of as an application of the ideas in Benabou\textsuperscript{2}Benabou and Tirole (2002b) is focused primarily on self-confidence and \textit{interpersonal} strategies. For example the potential importance of modelling self-confidence in contractual relationships.
and Tirole to labour market search.

Another set of interesting and closely related papers are Köszegi (2000a, 2000b). As in our paper, both of these papers assume individuals have *ego utility* (hedonic concern for self-image) and thus preferences over beliefs and thus the incentive to manipulate those beliefs where agent can choose to accept more signals or stop forever. As a result over-confidence will prevail because some individuals have incentive to stop accepting further signals. As a result over-confidence will prevail because some individuals have incentive to stop accepting further signals.3 The paper goes on to add informative actions (signals after the financial choice) and to demonstrate further interesting results about avoiding informative economic actions when satisfied with ego utility and seeking out informative actions when not satisfied with ego utility.4 As with Benabou and Tirole there are a number of differences in our work, for example, we do not focus on a critical level of success to generate ego utility and thus do not emphasize overconfidence but again our paper may best be thought of as a specific application of ideas in Köszegi to labour market search.

Research on the protection and enhancement of self-esteem in psychology has identified a set of strategies employed by individuals. These are usually classified as *preemptive* strategies which are intended to prevent damage to self-esteem or *reactive* strategies which are intended to undo damage to self-esteem (see Crocker and Park (2003) or Hoyle et al (1999)). According to Crocker and Park the list of preemptive strategies is: avoiding the situation; defensive pessimism; self-handicapping; and perfectionism. The list of reactive strategies is: dismissing the threat; compensating; abandoning contingencies; distancing from others; and downward comparison.

*Avoiding the situation* and thus avoiding the possibility of a self-esteem dam-

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3Weinberg (2004) another closely related paper also generates over-confidence results.
4The focus in Köszegi (2000b) is on sluggish information acquisition, procrastination, and delegation of information acquisition to objective others.
aging failure is considered the first line of defense in preemptive strategies (see Crocker and Park p. 299). *Self-handicapping* is a widely discussed and experimentally observed phenomena. In describing self-handicapping Shepperd and Arkin (1989) argue, individuals

... attempt to reduce a threat to esteem by actively seeking or creating inhibitory conditions that interfere with performance and, thus, provide a persuasive causal explanation for potential failure.

An example of self-handicapping is contained in early experiments conducted by Berglas and Jones (1978). Participants facing an intellectual task were offered the choice between what they were told was a performance enhancing drug, a performance inhibiting drug, or no drug. There was a significant set of participants who took the performance inhibiting drug. Other experiments which led to observations of self-handicapping by psychologists were in regard to putting oneself in distracting environments which inhibited practice or study, procrastination; and alcohol consumption before a task (see Hoyle et. al. (1999) chapter 6 for references).

*Defensive pessimism* which is sometimes labeled “lowering expectations” is another experimentally observed behaviour. In Norem and Cantor (1986) a group of university students were selected on the basis of high CGPA and were asked about their expectations regarding an upcoming test. A subset of the group reported a low expectation regarding their competence even though, like their complement, they had been repeatedly successful in past tests. Work was also done by the experimenters to separate defensive pessimists from depressed individuals. Psychologists interpret the value of this strategy as the lowering of expectations reducing stress or anxiety which then improves performance. It has also been argued that defensive pessimism may allow individuals to avoid
damaging strategies like self-handicapping. When experimenters interfered with this strategy by pointing out to the subject that given their past performance they should do very well, the subject’s performance on the test deteriorated.

*Downward comparison* is the observation that after a failure on an important domain, individuals tend to seek out negative information about the performance of others: they remember more negative information about others; actively seek out information about others who did poorly; and compare themselves only with people who did poorly. In an experiment by Psyrczynski, Greenberg, LaPrelle (1985), for example, participants were assigned grades on a test randomly and then offered the opportunity to look at the tests of those who had done well or those who done poorly. The people who thought they had done well were not interested in either and those who thought they had done poorly typically wanted only the tests with the low scores. This strategy has been observed in children as young as nine. This downward comparison is consistent with two other observations: almost everyone regards themselves as being better than average; and false consensus where people believe that their strengths are rarer than they are, while believing that their weaknesses are more common than they are.

If career success is important for individual self-esteem then a model which allows for self-esteem in labour-market search is potentially important. It will allow us to study self-esteem maintenance behaviours discussed above, in the economically important context of searching for employment. We begin by considering a simple two-period model with an individual who values consumption, does not value self-esteem, knows her/his intrinsic ability, and has the choice between taking an employment offer/wage or searching for a new opportunity (Section 2.1). With search the individual will receive a new wage offer determined in part by their ability and in part by luck. The familiar optimal strategy
for the individual is to search if the current wage offer is below a reservation wage which is an increasing function of patience (discount factor) and ability. We then assume that the individual’s intrinsic ability is not perfectly known by the individual rather they form a belief about their ability (Section 2.2). We show that the optimal behaviour is modified only in that their ability is replaced by their belief about their ability in the reservation wage function so that patient individuals with relatively poor current opportunities and a relatively high belief about their ability will search.

We then introduce self-esteem and assume that the individual derives utility from higher self-esteem and that the one operative self-esteem domain in the model is career competence or ability (Section 3). At this point updating of beliefs about one’s competence becomes important. We assume that individual understands the process by which new wage offers are generated and that the individual is Bayesian. With our simplifying assumptions Baye’s rule corresponds to the Kalman filter, so that the updated belief is a linear combination of the prior and the new wage offer (signal) with a weight on the signal decreasing in the variance of the stochastic element on the wage offer (uninformative noise in the signal). We define avoiding the situation as an individual who should search for a better opportunity from a material perspective but who does not. In other words, we explore whether Bayesian individuals would avoid job search in avoiding the truth.

We show that with sensitivity to self-esteem and strict concavity of the mapping from beliefs to utility (e.g. risk aversion) that there will be a set of

\[\text{The idea that an individual’s well-being is directly dependant on their self-esteem, of course, is consistent with the vast applied and clinical psychology literature on self-esteem which has been concerned with helping individuals raise their self-esteem. There is also evidence that the allocation of effort across activities such as grooming, volunteering, or studying are positively correlated with the relative weight the individual puts on different contingencies such as physical appearance, virtue, or academic competence (see Crocker et. al. (2001)).}\]
individuals who are avoiders (Section 3.1). The individual’s expectation about their future belief regarding ability is their current belief, but with risk aversion, the individual by avoiding the situation trades off expected material benefit for certainty on self-esteem. The implications are that those individuals who avoid the situation will learn less about their true ability and on average be materially poorer. These suggest that individual sensitivity to self-esteem may lead to a lower standard of material well being in a society. We show that the incentive to avoid will increase with the individual’s patience and the degree of sensitivity to self-esteem. The former result is somewhat surprising as in the absence of sensitivity to self-esteem the incentive to search is increasing in patience and more generally patience is often associated with richer individuals. One way to understand this result is to note that the incentive to avoid is driven by sensitivity to shocks in self-esteem and these consequences (in terms of updating one’s belief) matter most to people who place a high value on the future. With prudent individuals we show that the incentive to avoid will be non-increasing in self-esteem. This is consistent with Baumister, Tice, and Hutton (1989) who argue that preemptive strategies are more apt to be utilized by low self-esteem individuals. Finally with a quadratic functional form we show that the incentive to avoid first increases with increasing noisiness of the signal (while the weight on the signal in updating beliefs is high) and then decreases with noisiness as the weight on the signal is low.

We next introduce the possibility of self-handicapping (Section 3.2). In our model we interpret self-handicapping as an individual intentionally damaging his/her ability in exchange for a less informative, that is, noisier signal in pro-

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6There is experimental evidence that individuals with low self-esteem have a stronger affective or emotional response to a given self-esteem damaging failure (see Hoyle et. al. (1999 p. 87)).

7Prudence is that the third derivative of the state dependant utility function is non-negative. A rather standard assumption is non-increasing absolute risk aversion. Prudence is weaker—it is a necessary but not sufficient condition for non-increasing absolute risk aversion.
tecting self-esteem. We will imagine a simple extreme example where an individual can employ a costly technology (e.g. taking a performance inhibiting drug) which makes the labour market signal completely uninformative at a cost of a given reduction in ability. The implication of the uninformative wage signal is that an individual achieves certainty on their self-esteem, that is, the individual avoids the truth without avoiding the situation. Here we show that if the damage in ability is positive but less than the risk premium at some level of belief about ability, then situation avoiders and self-handicappers will co-exist. Consider an individuals with a given low initial wage as we move to individuals with higher self-esteem. We move from individuals who take employment to situation avoiders to self-handicappers and if the risk premium is decreasing in self-esteem, to those who search for a new job without self-handicapping. The logic as to why higher self-esteem individuals self-handicap rather than avoid the situation is that a belief of high ability makes search of greater expected benefit even if the search is self-handicapped.\(^8\)

We next consider downward comparison (Section 3.3). With strategies like self-handicapping or avoiding the situation, given the information set, individuals update truthfully (Bayesian). But the individual takes actions which manipulate the information set—covering one’s eyes. They would know that they are avoiding information which would lead to a more “truthful” or accurate assessment of themselves. Avoiding the situation could be descriptively labeled avoiding the truth. But, strategies like downward comparison or defensive pessimism seem to go even further. It is as if the individual avoids some information (tests with good grades) but not other information (tests with bad grades) in biasing their assessment—they cover only one eye. There is a large literature on

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\(^8\)Benabou and Tirole and Kőszegi interpret self-handicapping as choosing an inefficient task which is uninformative about ability versus an efficient one which is informative. This generates interesting results see Koyzegi p. 26. Our interpretation is different in the important way that the individual actually handicaps or lowers their ability. We believe this is closer to the psychologist’s view of self-handicapping.
self-deception in psychology and a good deal of debate more widely over what it means to deceive yourself.9

Rather than building an explicit model of downward comparison and labour market search we will simply ask the question; could an individual benefit from an inaccurate belief about themselves in our model? In other words; if they could deceive themselves in the sense of holding a biased belief (through some strategy such as downward comparison) would they benefit? We first show unsurprisingly that if the individual is insensitive to self-esteem having an accurate prior belief maximizes ex-ante expected utility. But we then show that an upwardly biased belief is best for a prudent individual who is sensitive to self-esteem.10 Part of the logic is that higher self-esteem simply makes the person feel better as utility is increasing in self-esteem, but this is not the whole story. We go on to show that an upward biased prior also increases material well-being of the individual when the individual is sensitive to self-esteem.11 In this case the upward biased belief leads the individual to avoid other materially damaging strategies such as avoiding the situation or self-handicapping and thus can increase material well-being. We believe that allowing for such interplay between different strategies is important for understanding self-esteem maintenance.

Finally, we consider imprudence in exploring defensive pessimism (Section 3.4). Imagine a situation where an individual must search (the current employment opportunity is sufficiently low or even negative) so that the choice is between search or search with self-handicapping. We show that if the individual is not prudent an inaccurate downwardly biased prior can increase the

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9See Benabou and Tirole (2002a) for a very interesting discussion.
10This maps nicely into the Benabou and Tirole model where given such an incentive they go on to build a game between selves. In our model the analogue to their story would be a self 0 generating self 1’s prior with a costly memory manipulation technology (see above) and self 1 who acts on the prior.
11This is related, of course, to whether the strategy could be adaptive evolutionary behaviour.
individual’s ex-ante expected utility. This is a surprising result because utility is increasing in self-esteem so that lowering your belief directly lowers your self-esteem and utility. The logic of the result is that with imprudence, self-handicapping occurs among high self-esteem individuals and then lowering the individual’s belief may increase utility indirectly by allowing the individual to avoid materially damaging strategies like self-handicapping.\textsuperscript{12} This is consistent with Norem and Cantor (1989 p. 95) who argue that reducing self-handicapping may be one benefit of defensive pessimism. Further, the defensive pessimists in our model are the high ability individuals. The logic is that the high ability will have a larger recovery in self-esteem in search without self-handicapping from the arrival of the new signal/information, so the cost of defensive pessimism is lower to the high ability.

We close by briefly considering some policy issues which arise from labour market search with self-esteem (Section 4). We look at workers out of the labour force, unemployment insurance, and minimum wages. Consider, for example, our results for workers out of the labour force or discouraged workers. Imagine that there are now three options: to work (employment); to stay at home (out of the labour force); and to search (unemployed). Consider a new worker coming on the market (no current employment opportunity) and who is not sensitive to self-esteem. In this case, no one stays at home unless there is a benefit from being at home in leisure, value from homework, or avoiding a pecuniary cost of search. The reason is that with no current opportunity and a non-positive value of being at home any individual would search. With this standard labour search result the idea that individuals not employed in the labour market and not searching for work are somehow "discouraged workers" is difficult to appreciate. When we

\textsuperscript{12} Benabou and Tirole generate defensive pessimism by assuming self 0 has an incentive to \textit{lower} the motivation of self 1. They argue that generating functional defensive pessimism in a hedonic approach, like ours, would require utility decreasing in ability. By interacting self-esteem maintenance strategies we have shown this to be false.
add the assumption of prudence and sensitivity to self-esteem this changes. We show that individuals at the lower levels of self-esteem will not participate in the labour market and stay at home even if they get no benefit (or even negative benefit) from being at home. The logic is that even though there is material benefit to search there is the threat of a self-esteem damaging event in search so that the low self-esteem (“discouraged”) worker stays at home. Unemployment insurance, by promoting search, can be beneficial when some workers choose not to search to avoid the situation. Similarly, minimum wage can spare one’s self-esteem by protecting a worker from receiving a bad signal associated with a very low wage offer. This protection can induce a worker to search more.

2 A Benchmark Model

2.1 Full Information

Consider a group of individuals who value stochastic streams of consumption \((c,c')\) according to the expected utility function:

\[
EU(c,c') = E[c + \beta c'],
\]

where \(\beta \geq 0\) is a subjective discount factor. Individuals differ in terms of some intrinsic ‘ability’ parameter, \(a \in A \subset \mathbb{R}_+\). One could interpret this parameter in many ways, but for concreteness, let us interpret \(a\) as an intrinsic skill parameter that influences a person’s wage, \(w \in [w_-, w_+] \equiv W \subset \mathbb{R}_+\). In this section, we assume that \(a\) is known to the individual. Assume that an individual’s wage is determined in part by their skill and in part by ‘luck;’ i.e.,

\[
w = a + \epsilon, \tag{1}
\]
where $\epsilon$ denotes the ‘luck’ parameter. One interpretation of $\epsilon$ is that it represents an idiosyncratic match parameter, measuring the ‘goodness of fit’ between an individual’s ability and the particular job at which he or she is employed. Assume that $\epsilon \sim N(0,\sigma^2)$. Furthermore, assume that individuals are distributed over $W$ such that the person with the lowest wage is several standard deviations above $\bar{w}$ and such that the person with the highest wage is several standard deviations below $\bar{w}$.\footnote{By invoking these assumptions, we will avoid having to deal with posterior distributions that are truncated Normal.}

Assume that each individual enters period one with a particular wage realization $w$. At this stage, the individual faces a simple binary choice problem. The first option is to exploit the current job opportunity, so that $c_1 = w$. If this option is chosen, then second-period consumption is determined by $c_2 = w$, so that the expected utility payoff from such an action is given by:

$$V^c(w) = (1 + \beta)w.$$  

Alternatively, the individual can reject the current job offer (without recall), so that $c_1 = 0$, and search. By doing so, the individual receives a new job offer $w' = a + \epsilon'$, where $\epsilon' \sim N(0,\sigma^2)$. For simplicity, assume that this new job offer must be accepted, so that $c' = w'$. The expected utility payoff from this action is given by:

$$V^s = \beta a.$$  

The solution to this choice problem is to adopt a ‘reservation wage’ strategy; i.e., if $w \geq w_R$, then ‘work;’ if $w < w_R$, then ‘search.’ The reservation wage $w_R$ depends on one’s patience and ability, and satisfies the restriction $V^s(w_R) = V^*$.
i.e.,

\[ w_R(a) = \left( \frac{\beta}{1+\beta} \right) a. \]  \hspace{1cm} (2)

### 2.2 Imperfect Information

Now imagine the more realistic scenario where individuals do not ‘know’ their own intrinsic ability perfectly. Of course, they are able to observe the market price of their labor. They also know that the market price of their labor is related to their intrinsic ability through equation (1). Thus, individuals face a ‘signal extraction’ problem; i.e., given \( w \), individuals make some inference over their true ability.

Let \( b \) denote an individual’s prior belief about their ability level. If an individual chooses to work at the current wage, then no further information is revealed so that \( b' = b \). But if an individual chooses to search, then the new wage offer will generally reveal some information about the individual’s true ability. In this case, the prior belief must be updated in some manner. In the present context, the issue of updating beliefs plays no role since the planning horizon is only two periods. That is, the reservation wage strategy in (2) is simply modified as follows:

\[ w_R(b) = \left( \frac{\beta}{1+\beta} \right) b. \]  \hspace{1cm} (3)

However, in subsequent sections, where we extend the model to self-esteem, beliefs (and how they are updated) will play a more fundamental role; so let us take some time here to describe how updating is imagined to occur.

The standard approach in statistical decision-making is to suppose that individuals are Bayesian. That is, if individuals know the law governing the distribution of ability, then Baye’s rule can be used to update one’s initial be-
lief after observing the new wage draw \(w'\). In abstract terms, Baye’s rule takes the form \(b' = g(b, w')\). If ability is normally distributed (along with the ‘noise’ variable \(\epsilon'\)), then Baye’s rule turns out to be linear in its arguments. It also happens to correspond to the Kalman filter (e.g., see Ljungqvist and Sargent (2000) p. 65); so that,

\[
b' = (1 - k)b + kw',
\]

where

\[
k = \frac{\Sigma}{\Sigma + \sigma^2},
\]

with \(\Sigma \equiv E(a - b)^2\), representing the individual’s prior over the variance of the distribution of ability (conditional on his prior \(b\)).

A few observations are in order. First observe that \(0 \leq k \leq 1\). This parameter governs the relative weight that an individual places on his initial prior \textit{vis-à-vis} the new signal in updating his belief. As \(k\) approaches unity, less weight is placed on the prior. Conversely, as \(k\) approaches zero, more weight is placed on the prior. In this setting, \(k\) is a parameter that is chosen optimally by the individual, given all available information concerning the distribution of ability, the noise term, and the initial priors \((b, \Sigma)\). In particular, note that for a given \(\Sigma\), an increase in the ‘noisiness’ of the wage offer (an increase in \(\sigma\)), leads to a lower value for \(k\) (i.e., the individual discounts the information associated with the new wage offer more heavily).

3 A Model of Self-Esteem

The focus of this paper will be to model an individual whose well being depends directly on self-esteem. We will define an individual’s self-esteem as a function:

\footnote{Subsequent to the realization of \(w'\), the individual would also update his estimate of \(\Sigma\), but since this updated second moment plays no role in our analysis, it will be ignored here.}
\( s(b_1, b_2, ..., b_N; \overline{\theta}) \), where \( b_i \) is the individual’s belief about their quality or ability on domain \( i \) and \( \overline{\theta} \geq 0 \) is trait or endowment self-esteem. Social psychologists argue that \( \overline{\theta} \) and the extent to which an individual’s self-esteem is contingent on a particular domain are determined by family, culture, and society so we will take them as exogenous to the individual but potentially differing across individuals.

We assume that \( s(b_1, b_2, ..., b_N; \overline{\theta}) = \overline{\theta} + \sum_{i=1}^{N} \theta_i b_i \) where \( \theta_i \) is the extent to which the individual’s self-esteem is contingent on domain \( i \).\(^{15}\) Further, we will focus on one domain, career competence, taking beliefs about all other domains as exogenous to the model and so for notational simplicity, \( s(b) = \overline{\theta} + \theta b \) with \( s'(b) = \theta > 0 \). Accordingly, we modify preferences so that expected utility now takes the following form:

\[
EU(c, b, c', b') = E[c + \lambda v(b) + \beta[c' + \lambda v(b') | b]
\]

where \( v(b) \equiv u(s(b)) \), and \( u() \) is the state dependant utility function over self-esteem with \( v'(b) > 0 \) and \( v''(b) \leq 0 \). The parameter \( \lambda \geq 0 \) indexes the degree to which a person ‘cares about’ self-esteem. Observe that this specification nests the usual specification of preferences when \( \lambda = 0 \).

In this setup, the payoff to work is given by:

\[
V^w(b, w) = (1 + \beta)(w + \lambda v(b)).
\] (5)

Likewise, the payoff to search is given by:

\[
V^s(b) = \lambda v(b) + \beta E[(w' + \lambda v(b')) | b].
\]

where \( w' = a + c' \) and \( b' = (1 - k)b + kw' \). Observe that \( E[w' | b] = b \), so that

\(^{15}\)The separable nature of domains is consistent with some experimental evidence and conjecture contained in Crocker and Park (see page 293).
the individual’s expected payoff from search can also be written as:

\[ V^*(b) = \lambda v(b) + \beta (b + \lambda E[v(b') | b]) \]  \hspace{1cm} (6)

Here, the reservation wage \( \hat{w}_R(b) \) satisfies \( V^*(b, \hat{w}_R) = V^*(b) \); i.e.,

\[ \hat{w}_R(b) = \left( \frac{\beta}{1 + \beta} \right) \{ b + \lambda (E[v(b') | b] - v(b)) \}. \]  \hspace{1cm} (7)

Observe that if \( \lambda = 0 \), then \( \hat{w}_R(b) = w_R(b) \). As well, since \( v \) is weakly concave, it follows that \( \hat{w}_R(b) \leq w_R(b) \).

Now, let \( S \equiv \{(w, b) \in W \times A : w < w_R(b)\} \). In words, the set \( S \) represents the set of individuals for whom search is an optimal decision from a purely pecuniary standpoint (i.e., when \( \lambda = 0 \)). However, to the extent that individuals care directly about their self-esteem, there may be individuals belonging to the set \( S \) who would rationally choose not to search, despite the expected pecuniary benefits of doing so. Such individuals, if they exist, are avoiding the job search situation and in a sense ‘avoiding the truth and consequences’ of an unfavorable wage signal that compels them to lower their belief about their ability and thus their self-esteem. Let \( T \subset S \) denote the set of initial beliefs that induce situation-avoidance; i.e., \( T \equiv \{(w, b) \in S : \hat{w}_R(b) \leq w < w_R(b)\} \).

### 3.1 Avoiding the Situation in Avoiding the Truth

*Avoiding the situation* and thus avoiding the possibility of a self-esteem damaging failure is considered the first line of defense in preemptive strategies.

**Proposition 1** Let \( v(b) = \alpha_0 + \alpha_1 b \), where \( (\alpha_0, \alpha_1) \) are any real numbers. Then \( E[v(b') | b] = v(b) \).
Proof. From the Kalman filter equation (4) and \( E[w' | b] = b \), we have
\[
E[b' | b] = (1 - k)b + kE[w' | b] = b.
\]
Then \( E[v(b') | b] = E[\alpha_0 + \alpha_1 b' | b] = \alpha_0 + \alpha_1 b = v(b) \).

**Proposition 2** Let \( v(b) = \alpha_0 + \alpha_1 b \), where \( (\alpha_0, \alpha_1) \) are any real numbers. Then, for any \( \lambda \geq 0 \), we have \( T = \{ \emptyset \} \).

Proof. The proof follows directly by applying Proposition 1 to the reservation wage equation (7), which implies that \( \hat{w}_R(b) = w_R(b) \), independent of \( \lambda \).

The results imply that avoiding the situation requires not only that individuals care about self-esteem, but that individuals are averse to the risk associated with future changes in their level of self-esteem \((v''(b) < 0)\). The logic of the result is that an individual with \( v(b) = \alpha_0 + \alpha_1 b \) is only concerned with expected self-esteem and the individual’s expectation about their future belief about their ability is \( E[b' | b] = b \). As a result, receiving the signal poses no expected threat to self-esteem and the individual is driven by material benefit only, so that \( \hat{w}_R(b) = w_R(b) \) and \( T = \{ \emptyset \} \).

There is experimental evidence that individuals with low self-esteem have a stronger affective or emotional response to a given self-esteem damaging failure (see Hoyle et. al. (1999 p. 87)). We capture this by assuming strict concavity, \( v''(b) < 0 \).

**Proposition 3** With sensitivity to self-esteem \((\lambda > 0)\) and \( v''(b) < 0 \), we have \( T \neq \{ \emptyset \} \).

Proof. The proof follows directly from (7) and the fact that \( \hat{w}_R(b) < w_R(b) \) when \( v'' < 0 \).

As before the individual’s expectation is \( E[b' | b] = b \), but now the introduction of strict concavity introduces risk aversion so that by avoiding the situation
an individual trades off expected material benefit in exchange for certainty on self-esteem.

The implications of proposition 3 are that those individuals who avoid the situation will learn less about their true ability and on average be poorer. This result suggests that individual sensitivity to self-esteem may lead to a lower standard of material well being in a society.

3.1.1 Who are the Truth-Avoiders?

In this section, we examine the characteristics that make individuals likely to be ‘avoiders.’ We first define $\Delta$ as the maximum amount of certain consumption in each period which the searching individual would be willing to give up to avoid the risk to self-esteem. This can be thought of as a risk premium measured in units of consumption (rather than $b$). First, note that the payoff to searching in the absence of risk is $V^x(b) = \lambda v(b) + \beta(b + v(b))$ given the assumption that $b' = b$ with certainty. Since $\Delta$ is consumed in each period, we have $(1 + \beta)\Delta \equiv V^x(b) - V^*(b)$ which from (7) is

$$\Delta = \left(\frac{\beta}{1 + \beta}\right) \lambda (v(b) - E[v(b') | b]).$$

Notice that we can define the incentive to avoid as the difference $w_R(b) - \hat{w}_R(b)$ which by (3) and (7) equals $\Delta$. So we will interchangeably refer to $\Delta$ as the risk premium or the incentive to avoid. We illustrate the reservation wages and the incentive to avoid in $(b, w)$ space in figure 1.\footnote{Figure 1 is drawn for a quadratic functional form (see below).}

Figure 1

At any given point in the parameter space $(\lambda, \beta, \sigma)$, Figure 1 illustrates that truth-avoiders (individuals with $(b, w)$ combinations between $\hat{w}_R(b)$ and
\(w_R(b)\) consist of those individuals with lower than average wages. However, some truth-avoiders have relatively high wages. But these individuals have even higher levels of self-esteem. Given their high assessment of themselves, in the absence of self-esteem motives, they should search but do not for fear of the consequences of what they might learn about themselves.

**Proposition 4** Necessary conditions for avoiding the situation \((\Delta > 0)\) include: \(\lambda > 0\), \(\beta > 0\), \(v'' < 0\), and \(k > 0\) \((\sigma^2 < \infty)\).

**Proof.** It is obvious that both \(\lambda > 0\), and \(\beta > 0\) are necessary conditions for some agents to choose to avoid the situation. Moreover, \(v'' < 0\) is also necessary for \(v(b) - E[v(b') | b] > 0\). If \(\sigma^2 = \infty\) then \(k = 0\) so that from the Kalman filter \((4)\), \(b' = b\) and \(v(b) - E[v(b') | b] = 0\) so these are also necessary for avoiding the situation. ■

Avoiding requires that there is some information about one’s ability in any wage signal as if \(\sigma^2 = \infty\) then \(k = 0\) so that there is no risk from searching because the signal is simply noise. People must also care about the future; i.e., \(\beta > 0\). In this model when the future is fully discounted, it makes sense for everyone (regardless of how they value self-esteem) to retain their current job offer, since doing otherwise would entail foregoing a current wage for a future return.

Any parameter change that leads to an increase in \(\Delta\) will lead to an increase in the set of avoiders (see Figure 1). From equation \((8)\), we see that increases in \(\lambda\) and \(\beta\) increase avoidance. The logic for the former is obvious, but that patience leads to more avoidance is surprising as in the absence of sensitivity to self-esteem the incentive to search is increasing in patience (see \((3)\)) and more generally patience is often associated with richer individuals. One way to understand this result is to note that the incentive to avoid is driven by
sensitivity to shocks in self-esteem and these consequences (in terms of updating one’s belief) matter most to people who place a high value on the future. For the next proposition we define prudence as $v''(b) \geq 0$.

**Proposition 5** The incentive to avoid the situation, $\Delta$, is non-increasing in self-esteem with prudent individuals $v'' \geq 0$.

**Proof.** The derivative $d\Delta/db$ has the same sign as $d(v(b) - E[v(b') | b])/db = v'(b) - E[v'(b') | b]$. An necessary and sufficient condition for $v'(b) - E[v'(b') | b]$ to be non-positive is that $v'(b)$ be convex. Consequently, $v''(b) \geq 0$ is a necessary and sufficient condition for $\Delta$ to be non-increasing in self-esteem.

When $v'' > 0$ the incentive to engage in this strategy will decrease with self-esteem. Proposition 5 is consistent with the notion that low self-esteem and the preemptive strategy of avoiding the situation are related. The view in social psychology (see Baumister, Tice, and Hutton (1989)) is that the use of preemptive strategies is more typical of those with low self-esteem. This happens in our model under the rather standard assumption of prudence. The vast applied and clinical psychology literature on self-esteem has been concerned with helping individuals raise their self-esteem. Our model suggests that in the addition to making the individual feel better about themselves, increasing self-esteem may well have important implications for material well-being to the extent that it allows individuals to engage in more risky search for productive possibilities.

Finally, in understanding the impact of an increase on $\sigma^2$ (the noise associated with the wage signal) and the incentive to avoid requires a parametric example. In particular, assume that there is no endowed self-esteem ($v(0) = 0$).

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17 A rather standard assumption in the economics of uncertainty literature is that individuals have non-increasing absolute risk aversion and prudence is necessary but not sufficient (weaker) for non-increasing absolute risk aversion.
and that the function $v$ is quadratic; i.e.,

$$v(b) = Ab - \frac{1}{2}Bb^2.$$  \hspace{1cm} (9)

Here, we assume that both $w$ and $b$ are distributed ‘far below’ the upper bound $A/B$. With this specification, we have $v'(b) = A - Bb > 0$, $v''(b) = -B < 0$, and $v''' = 0$. Since $w_R(b) = (\frac{\beta}{1+\beta}) b$, it follows that $w'_R(b) = (\frac{\beta}{1+\beta}) < 1$. From (7) and (9), we can solve analytically for the reservation function when $\lambda > 0$; i.e.,

$$\hat{w}_R(b) = w_R(b) - \lambda \frac{\beta}{2(1+\beta)} Bk^2\sigma^2 \text{ and } \Delta = \lambda \frac{\beta}{2(1+\beta)} Bk^2\sigma^2.$$  \hspace{1cm} (10)

Another complication here is that $k$ depends on the variance,

$$\frac{dk}{d\sigma^2} = -\frac{\Sigma}{(\Sigma + \sigma^2)^2} < 0.$$

Using this and differentiating (8) with respect to $\sigma^2$ yields:

$$\frac{d\Delta}{d\sigma^2} = \lambda \left( \frac{\beta}{1+\beta} \right) \frac{Bk^2}{\Sigma + \sigma^2} \left( \Sigma - \sigma^2 \right) / 2.$$  \hspace{1cm}

So that,$$
\frac{d\Delta}{d\sigma^2} > 0 \text{ as } \Sigma = \sigma^2 > \Sigma = \sigma^2$$

Thus the graph of $\Delta$ as a function of $\sigma^2$ would increase from zero as $\sigma^2$ increases from zero, reach a maximum at $\Sigma = \sigma^2$ and then decrease with increases in $\sigma^2$. 

\hspace{1cm} \(^{18}\)Figure 1 is drawn for this quadratic case where $\hat{w}_R(b)$ is just a vertical displacement of $w_R(b)$ and $d\Delta/db = 0$. 

22
until it approaches zero as $\sigma^2$ approaches infinity. This is also related to $k$ as

$$\Sigma = \sigma^2 \text{ as } k = \frac{1}{2}$$

so that if $k > 1/2$ ($k < 1/2$) then $\Delta$ is increasing (decreasing) in $\sigma^2$. In other words when the individual places more (less) weight on signal than the prior in updating then an increase in the variance of the signal leads to more (less) avoidance.

### 3.2 Self-Handicapping

Self-handicapping is a widely discussed and experimentally observed phenomena. In our model we interpret self-handicapping as an individual intentionally damaging their ability, $a$, in exchange for a less informative or noisier signal in protecting their self esteem. We will imagine a simple example of self-handicapping where an individual can undertake a self-handicapping strategy which drives the variance of the labour market signal to infinity (imagine taking a performance inhibiting drug) but in the process reduces their $a$ and $b$ by some number $z$. The implication of the uninformative wage signal is that $k = 0$ so that from the Kalman filter $b' = b$ and the individual achieves certainty on their self-esteem with search!

The payoff to this self-handicapping strategy is given by:

---

19 For a definition and example see the introduction.
\[ V^h(b) = \lambda v(b) + \beta E[w' + \lambda v(b') | b] \]
\[ = (1 + \beta)\lambda v(b) + \beta(b - z). \]

as \( b' = b \) with \( k = 0 \) and \( E[w'] = b - z \) with \( w' = a - z + \epsilon' \). Comparing \( V^h(b) \) to \( V^e(b, w) \) we find a reservation wage between not searching and searching with self-handicapping, \( \bar{w}_R(b) \), which satisfies \( V^e(b, \bar{w}_R(b)) = V^h(b) \),
\[ \bar{w}_R(b) = \left( \frac{\beta}{1 + \beta} \right) \{b - z\}. \]  

(11)

Comparing \( V^h(b) \) to search without self-handicapping \( V^s(b) \) is simpler because neither depends on \( w \) as both strategies involve job search in the first period. With simplification we find that

\[ > < \]
\[ V^h(b) = V^s(b) \text{ as } z = \lambda (v(b) - E[v(b') | b]) \]  

(12)

Proposition 6 If \( 0 < z < \lambda (v(b) - E[v(b') | b]) \) for some range of beliefs about ability, \((\underline{b}, \overline{b})\) then situation avoiders will coexist with self-handicappers as the set of self-handicapping individuals is not empty and the set of situation avoiders is not empty. With prudent individuals and \( z < \lambda (v(b) - E[v(b') | b]) \) for \((\underline{b}, \overline{b})\) the range will correspond to the individuals with the lowest levels of self-esteem.

Proof. From (12) with \( z < \lambda (v(b) - E[v(b') | b]) \) then individuals with \( b \in (\underline{b}, \overline{b}) \) and \( w < \bar{w}_R(b) \) will self-handicap. From (12) with \( z > 0 \) individuals with \( b \in (\underline{b}, \overline{b}), \bar{w}_R(b) < w < w_R(b) \) will avoid. With prudence, \( \lambda (v(b) - E[v(b') | b]) \) decreases with \( b \) by the proof of proposition 5 so that indi-
viduals who are job searching will search with self-handicapping if $V^h(b) > V^*(b)$ or with $b < \bar{b}$ where $\bar{b}$ is given by $V^h(\bar{b}) = V^*(\bar{b})$ by (12) and will search without self-handicapping if they have $b > \bar{b}$.

In constructing Figure 2 note $\tilde{w}_R(0) = \frac{\beta z}{\beta + \frac{z}{2}} < 0$, $\tilde{w}_R(z) = 0$, and $\tilde{w}_R'(b) = \left(\frac{\beta}{1 + \frac{z}{2}}\right)$ a constant.

Figure 2

Proposition 6 is illustrated in Figure 2. Individuals with $(b, w)$ combinations above line segments $0z$, $yz$, and ray $xy$ will take employment; individuals with $(b, w)$ combinations above line segments $0z$, $yz$, and ray $xy$ but below $w_R(b)$ will be avoiders; individuals with $(b, w)$ combinations in the triangle $z\bar{b}y$ will be self-handicappers; and individuals with $(b, w)$ combinations to the right of $\bar{b}y$ and below $\tilde{w}_R(b)$ search without self-handicapping. The logic as to why higher self-esteem individuals self-handicap rather than avoid the situation is that a belief of high ability makes search more attractive even if such search involves self-handicapping.

3.3 Downward Comparison and Self-Deception

With strategies like self-handicapping or avoiding the situation, given the information set, individuals can be interpreted as updating truthfully. But then the individual takes actions which manipulate their information set—covering one’s eyes. They would know that they are avoiding information which would lead to a more “truthful” or accurate assessment of themselves. Avoiding the situation could be descriptively labeled avoiding the truth. But, strategies like downward comparison seem to go even further. It is as if the individual avoids some information (tests with good grades) but not other information (tests with bad grades) in biasing their assessment of themselves—they cover only one eye.
Rather than building an explicit model of downward comparison we will simply ask the question; would an individual benefit from an inaccurate belief about themselves? In other words; if they could deceive themselves in the sense of holding a biased belief would they benefit? To keep matters simple we will assume that avoiding the situation dominates self-handicapping (e.g. $z > \lambda (v(b) - E[v(b') | b]) \forall b$.

The ex-ante expected utility of an individual with ability $a$ but who has belief $b$ and therefore follows the reservation wage strategy discussed above in Section 3.1 is,

$$EU(b; a) = P(w \leq \hat{w}_R(b)|a,b)\{\lambda v(b) + \beta(E[w' + \lambda v(b') | a, b])\}$$

$$+ P(w > \hat{w}_R(b)|a,b)(1 + \beta)\{E[w|w > \hat{w}_R(b), a, b] + \lambda v(b)\}$$

$$= P(w \leq \hat{w}_R(b)|a,b)\{\lambda v(b) + \beta(a + \lambda E[v((1-k)b + kw')] | a, b)\}$$

$$+ P(\epsilon > \hat{w}_R(b) - a|a,b)(1 + \beta) \left[ \int_{\hat{w}_R(b) - a}^{\infty} [a + \epsilon]f(\epsilon)d\epsilon \right]$$

$$= \{\lambda v(b) + \beta [a + \lambda \int v([1-k]b + k[a + \epsilon])f(\epsilon)d\epsilon] \int_{-\infty}^{\hat{w}_R(b) - a} f(\epsilon)d\epsilon \}$$

$$+ (1 + \beta) \left[ \int_{\hat{w}_R(b) - a}^{\infty} [a + \epsilon]f(\epsilon)d\epsilon + \lambda v(b) \int_{\hat{w}_R(b) - a}^{\infty} f(\epsilon)d\epsilon \right]$$

We then ask the question; would this individual benefit from an accurate belief $b$ (i.e. $b$ close to $a$) or would the individual benefit from self-deception? Our idea in moving towards an answer is to compare the well-being of an individual who happens to have a relatively accurate belief (e.g. $b = a$) to the well-being of that same individual with an inaccurate belief ($b \neq a$). We operationalize this idea by taking a derivative of $EU(b; a)$ with respect to $b$.
\[
\frac{dE(U)}{db} = \lambda v'(b) + \beta \int v'(b')(1 - k) f(e) de \int_{\hat{w}_R(b)-a}^{\hat{w}_R(b)-a} f(e) de \\
+ \lambda v'(b) \int_{\hat{w}_R(b)-a}^{\hat{w}_R(b)-a} f(e) de \\
+ [\beta a + \lambda \beta E[v(b') | b] - \beta \lambda v(b) - (1 + \beta) \hat{w}_R(b)] \frac{d\hat{w}_R}{db} f(\hat{w}_R(b) - a) \\
= \beta (a - b) \frac{d\hat{w}_R}{db} f(\hat{w}_R(b) - a) \\
+ \lambda v'(b) + \lambda \beta v'(b) \int_{\hat{w}_R(b)-a}^{\hat{w}_R(b)-a} f(e) de \\
+ \lambda \beta \int v'(b')(1 - k) f(e) de \int_{-\infty}^{\hat{w}_R(b)-a} f(e) de.
\]

We will also assume prudence. By the proof of Proposition 5 prudence is sufficient for,

\[
\frac{d\hat{w}_R}{db} = \frac{\beta}{1 + \beta} \left( 1 + \lambda \frac{dE[v(b') | b] - v(b)}{db} \right) > 0,
\]

and becomes the necessary condition as \( \lambda \to \infty \).

**Proposition 7** When the individual is insensitive to self-esteem \( \lambda = 0 \), the belief which maximizes ex-ante expected utility \( (b^U) \) is an accurate belief or \( b^U = a \).

**Proof.** With \( \lambda = 0, \) \( \frac{dE(b; a)}{db} = [a - b^U] \beta \frac{d\hat{w}_R}{db} f(\hat{w}_R(b) - a) = 0 \Rightarrow b^U = a \)

This is, of course, what one should expect in the standard model.

**Proposition 8** When the prudent individual is sensitive to self-esteem \( \lambda > 0 \) the belief which maximizes ex-ante expected utility is an upwardly biased belief or \( b^U > a \).

**Proof.** The terms in the second and third lines on the RHS of (13) are all
positive. Given prudence $\frac{d\hat{w}_R}{db} > 0$. Therefore $b^U > a$. \[\]

Part of the logic is that self-esteem is increasing in the individual’s belief about their ability and their utility depends directly on self-esteem (second and third lines). So there is direct benefit of upward bias in their belief about themselves in that it makes them feel good about themselves, but this is not the whole story.

Consider the individual who is sensitive to self-esteem and thus follows $\hat{w}_R(b)$, but consider that individuals ex-ante expected material well being,

$$ EM(b; a) = \beta a \int_{-\infty}^{\hat{w}_R(b) - a} f(e)de + (1 + \beta) \int_{\hat{w}_R(b) - a}^{\infty} [a + \epsilon] f(e)de. $$

We then ask the question; would this individual materially benefit from an accurate belief $b = a$ or does the individual have a material incentive for self-deception as well? Taking the derivative of the ex-ante expected material well being with respect to $b$ we get:

$$ \frac{dEM(b; a)}{db} = \beta a \frac{d\hat{w}_R}{db} f(\hat{w}_R(b) - a) - \beta \frac{d\hat{w}_R}{db} [b + \lambda (E[v(b') | b] - v(b))] f(\hat{w}_R(b) - a) \]

**Proposition 9** When the individual is sensitive to self-esteem $\lambda > 0$ the belief which maximizes ex-ante expected material benefit ($b^M$) is an upwardly biased belief or $b^M > a$.

**Proof.** $\frac{dEM(b; a)}{db} = \frac{d\hat{w}_R}{db} f(\hat{w}_R(b) - a) \beta (a - b^M - \lambda (E[v(b') | b] - v(b))) = 0$

which implies $b^M = a - \lambda (E[v(b') | b] - v(b)) > a$.

\[\]

\[20\] With the quadratic case where $v(b) = Ab - \frac{B}{2}b^2$ we have $\hat{w}_R(b) = \frac{\beta}{1 + \beta} b - \frac{\beta}{1 + \beta} B k^2 a^2$

so $\frac{d\hat{w}_R}{db} = \frac{\beta}{1 + \beta} > 0$ and $b^M = a + \frac{\beta B k^2 a^2}{2}$. 28
That it is possible to make holding an inaccurate belief increase utility when utility is an increasing function of the belief is not difficult to understand. On the other hand, that it is possible to also increase material well-being of the individual is more surprising. The logic behind this result is that the upward biased belief allows the individual to avoid materially damaging strategies such as avoiding the situation. Consider Figure 1 and an individual who happens to have an accurate belief and a \((w, b = a)\) combination which leads to avoidance, that is, an individual who does not search but should from a material perspective. Then increase their \(b\) above \(a\) so that they switch to searching and they will benefit materially. This also maps nicely into the Benabou and Tirole model where given such an incentive they go on to build a game between selves. In our model the analogue would be a self \(0\) (who generates self \(1\)’s prior) with a costly memory manipulation technology. This would induce a non-cooperative game between the selves and generate results as in Benabou and Tirole where there are equilibria with an individual (both selves) who does not do as well as possible for his/herself given their preferences, endowments, and potential access to information.

3.4 Defensive Pessimism as Imprudence

Benabou and Tirole (2002) argue that models which have preferences directly over beliefs as in our model, would require \(v' < 0\) to derive defensive pessimism. It turns out that if an individual with \(v' > 0\) is imprudent \((v'' < 0)\) then it is possible to derive defensive pessimism. The approach is similar to the previous section, but here we will show that ex-ante expected utility can be decreasing in \(b\) over some range of \(b\).

To keep matters simple we will assume that avoiding the situation is not feasible (the current employment opportunity is sufficiently bad so that they
will search) but that search with self-handicapping is possible. With imprudence \( v'' < 0 \), \( \lambda (v(b) - E[v(b') | b]) \) is increasing in \( b \). We assume that \( z < \lambda (v(b) - E[v(b') | b]) \) for some \((b, \bar{b})\). In this case the individual must search and those with the higher self-esteem will self-handicap or those with \( b > \bar{b} \) where \( V^h(b) = V^s(\bar{b}) \). From (12), \( \bar{b} \) is given by

\[
z = \lambda (v(\bar{b}) - E[v(b') | \bar{b}]) = \lambda (v(\bar{b}) - \int v((1 - k)b + k(b + \epsilon))f(\epsilon)d\epsilon)
\]

The ex-ante expected utility of an individual with ability \( a \) who has belief \( b \) and therefore follows the strategies above is,

\[
EU(b; a) = \left\{
\begin{array}{ll}
V^s(b; a) = \lambda v(b) + \beta(a + \lambda \int v(b')f(\epsilon)d\epsilon) & \text{if } b \leq \bar{b} \\
V^h(b; a) = (1 + \beta)\lambda v(b) + \beta(a - z) & \text{if } b > \bar{b}
\end{array}
\right.
\]

We ask; would this individual benefit from an accurate belief \( b \) (i.e. \( b \) close to \( a \)) or would the individual benefit from self-deception? As before, we operationalize this by looking at optimized values of \( EU(b; a) \) with respect to \( b \).

First, it is clear that there is a material benefit of downward bias. Setting \( \lambda = 0 \) makes the obvious point that it is always best from a material perspective to search without handicapping. Second, it is also clear that the payoff under each strategy is increasing in \( b \) so that if increasing \( b \) does not lead to a change of strategy then increasing \( b \) increases \( EU(b; a) \). So if an individual is not going to handicap it is best to have \( b = \bar{b} \) and if the individual is going to handicap it is best to have the highest possible prior believe about ability. We assume that there is upper bound on your prior of \( \bar{b} \) with the associated upper bound on \( v(\bar{b}) \). Thus the payoff can be written as

\[21\] Think of this as a constraint on the information transmission from self 0 to self 1 in the
\[ EU(a) = \begin{cases} 
V^s(b; a) = \lambda v(b) + \beta(a + \lambda \int v((1 - k)b + k(a + \epsilon)) f(\epsilon) d\epsilon) & \text{if } b = b \\
V^h(b; a) = (1 + \beta)\lambda v(b) + \beta(a - z) & \text{if } b = b 
\end{cases} \]

Note that \( dV^s(b; a)/da > dV^h(b; a)/da \). First consider \( V^h(b; 0) \leq V^s(b; 0) \) and given the result that \( V^s(b; a) \) is increasing more quickly in \( a \), then individuals of all abilities would be best to search without self-handicapping and have \( b = b \) including those with \( a > b \) who would therefore be defensive pessimists. Now assume that \( V^h(b; 0) > V^s(b; 0) \). With cancellation and substitution of the defining equation for \( b \) to eliminate \( z \) we have,

\[
V^h(b; a) - V^s(b; a) = (1 + \beta)\lambda(v(b) - v(b)) + \beta\lambda \int v((1 - k)b + k(b + \epsilon)) f(\epsilon) d\epsilon - \beta\lambda \int v((1 - k)b + k(a + \epsilon)) f(\epsilon) d\epsilon.
\]

Given \( \underline{a} \) defined by \( V^h(b; a) = V^s(b; a) \) we have that individuals with \( a < \underline{a} \) would be best to search with self-handicapping and have \( b = b \) and those with \( a \geq \underline{a} \) would be best to simply search and have \( b = b \). Further notice that because the term on the first line is positive and the terms on the second and third lines are negative iff \( a > \underline{a} \) then \( \underline{a} > \underline{b} \). Thus high ability individuals \( (a > \underline{a}) \) are made better off by defensive pessimism as they do best with searching without self-handicapping and having \( b = \underline{b} < a \).

The logic is that the potential benefit of defensive pessimism is the material gain associated with avoiding self-handicapping which occurs with a low prior story discussed above. You simply cannot convince yourself that your prior should be that you are of the unlimited ability. We do not put a constraint on your posterior.
given imprudence. The reason that it is the high ability who benefit from defensive pessimism is because their higher ability will lead to larger expected recovery of self-esteem once the new signal/information arrives.

There are also some interesting comparative statics here. The cutoff \( a \) is independent of \( \lambda > 0 \), and decreasing in \( \beta \) and \( k \). The greater the patience the larger the range of abilities which lead to defensive pessimism. This is because increasing patience makes the recovery of self-esteem for the high ability more important. A larger \( k \) reduces the \( a \) as again this makes the expected signal more important and thus more defensive pessimists should be expected in an environment which is very informative.

4 Policy Implications

We will briefly look at three labour policy issues, namely discouraged workers, unemployment insurance, and minimum wages in our model of labour market search with self-esteem.

4.1 Discouraged Workers?

Imagine that there are now three options: to work (employment); to stay at home (out of the labour force); and to search (unemployment). The payoff to taking employment in the first period is given by (5). Given a per period return to being out of the labour force of \( R \), the payoff to being at home is

\[
V^d(b) = (1 + \beta)(R + \lambda v(b)).
\]

so the individual would choose home work over employment if \( R > w \) and employment over home work if \( R \geq w \). The payoff from search when homework
is possible is modified to allow an individual who searches in the first period to take homework in the second period if the wage offer $w'$ is not above $R$. The payoff is thus,

$$V^*(b) = \lambda v(b) + \beta E[\text{Max}[w', R] + \lambda v(b')] \mid b).$$

where

$$E[\text{Max}[w', R] \mid b] = p(w' < R)R + p(w' > R)E[w' \mid w' > R]$$

$$= R \int_{-\infty}^{R-b} f(\epsilon) d\epsilon + b \int_{R-b}^{\infty} f(\epsilon) d\epsilon + \int_{R-b}^{\infty} \epsilon f(\epsilon) d\epsilon.$$

Here, the reservation wage $\tilde{w}_R(b)$ satisfies $V^*(b, \tilde{w}_R(b)) = V^*(b),$$

$$\tilde{w}_R(b) = \left( \frac{\beta}{1 + \beta} \right) (E[\text{Max}[w', R] \mid b] - \lambda(v(b) - E[v(b')] \mid b)). \quad (15)$$

We assume that $E[w'' \mid b] - \lambda(v(b) - E[v(b')] \mid b) < 0$ at $b = 0$. Also notice that with prudence

$$0 < \frac{d\tilde{w}_R(b)}{db} = \frac{\beta}{1 + \beta} \left( \frac{dE[\text{Max}[w', R] \mid b]}{db} + \lambda \frac{d(E[v(b')] \mid b) - v(b))}{db} \right) < \frac{d\tilde{w}_R(b)}{db},$$

which uses

$$0 < \frac{dE[\text{Max}[w', R] \mid b]}{db} = \int_{R-b}^{\infty} f(\epsilon) d\epsilon < 1 = \frac{dE[w' \mid b]}{db}.$$

With prudence,
\[
\frac{d(V^s(b) - V^d(b))}{db} = \beta \left( \frac{dE[w'' | b]}{db} + \lambda \frac{d(E[v(b') | b] - v(b))}{db} \right) > 0 \quad (16)
\]

Finally, define \( \tilde{b} \) such that \( \tilde{w}_R(\tilde{b}) = R \). Then \( V^s(\tilde{b}) = V^e(\tilde{b}, R) = V^d(\tilde{b}) \) with the first equality by the definition of \( \tilde{b} \) and the second equality by \( V^d(b) = V^e(b, R) \) for all \( b \) given \( w = R \). These results and (16) imply that when choosing between searching and staying at home that the individual would prefer home when \( b \leq \tilde{b} \) and prefer search when \( b > \tilde{b} \). These results are illustrated in Figure 3a, where an area (combinations of \((b, w)\)) marked with: an E are individuals who take employment; a S are individuals who search; and with a H are individuals who stay home.

Figure 3a and 3b

Employed individuals have wages which are high relative to self-esteem, searchers have self-esteem which is high relative to wages, and those out of the labour force have relatively low wages and self-esteem.

Now reduce the return to staying at home down to zero as in Figure 3b. Consider a worker with no or even negative current employment opportunities (e.g. a new worker coming on the market) and who is not sensitive to self-esteem (\( \tilde{w}_R \) becomes \( w_R \)). In this case the set of individuals at home is empty unless there is a positive benefit from being at home in deriving leisure or value from homework (\( R > 0 \)) or avoiding a positive pecuniary search cost. The reason is that with no current opportunity and a non-positive value of being at home (\( R = 0 \)) all individuals would search. With this standard labour search result the idea that individuals not employed in the labour market and not searching for work are somehow "discouraged workers" is difficult to appreciate. But now add a sensitivity to self-esteem and individuals at the low levels of self-esteem
(\(b < \hat{b}\)) will not participate in the labour market even if they derive no benefit (or even disutility) from being at home as in Figure 3b. The logic is that even though there is material benefit to search there is the risk of a self-esteem damaging event in search so that the low self-esteem workers do not search. So in our model discouraged workers can be interpreted as low wage and low self-esteem individuals who are immobilized because search has the risk of a self-esteem damaging event.

### 4.2 Unemployment Insurance

We introduce a very simple unemployment insurance scheme, which pays \(\mu\) to unemployed agents (searchers) and focus on a very simple benefit of such a scheme with search, employment, and avoidance.\(^{22}\) The unemployment benefits are financed by a lump-sum tax on all agents.\(^{23}\) The reservation wage for an individual who is sensitive to self-esteem is now given by:

\[
\hat{w}_R(b) = w_R(b) - \left(\frac{\beta}{1 + \beta}\right) \lambda (v(b) - E[v(b') | b]) + \frac{\mu}{1 + \beta}.
\]

The incentive to avoid is,

\[
\Delta = \left(\frac{\beta}{1 + \beta}\right) \lambda (v(b) - E[v(b') | b]) - \frac{\mu}{1 + \beta}.
\]

So choosing \(\mu = \beta \lambda (v(b) - E[v(b') | b]) > 0\) to cover the risk premium (measured in units of first-period consumption) would eliminate the incentive to avoid, in other words, the individual in maximizing utility maximizes their expected

\(^{22}\)To eliminate self-handicapping we can assume a large enough \(z\) and to eliminate workers staying at home we can assume a negative enough \(R\). Unemployment insurance is designed for those in the labour force but not employed (searchers). But it would also be of interest to consider a government which could not separate searchers from those at home so that everyone but the employed receive payments.

\(^{23}\)A tax imposed only on the workers would generate the same results, while a proportional tax on the wage would generate comparable ones.
material benefit. The implication is that by unemployment insurance reducing avoidance, individuals will learn more about their true ability and on average be richer. These suggest that unemployment insurance can lead to materially richer societies.\textsuperscript{24} This result is similar to the one from Acemoglu and Shimer (1999), where search is distorted because of risk aversion. In both case moderate unemployment insurance can improve the output by stimulating search.

4.3 Minimum Wage

Under minimum wage laws, it is illegal for an employer to offer a wage below minimum wage $\underline{w}$. Consequently, a worker who draws a matching component such as $a + \epsilon < \underline{w}$ would receive no offer since the firm would make a loss offering $\underline{w}$. We normalize such an offer to $w = 0$. The introduction will have two different types of impact on the agent’s decisions. Obviously, all agents who receive no initial wage offers ($w = 0$) would have to search.\textsuperscript{25} In that sense, a minimum wage is a blunt instrument which forces agents with low wage offers to search. Without sensitivity to self-esteem this impact of minimum wage policy would reduce the expected monetary payoff but with sensitivity the minimum wage can have a positive impact on the material payoff of individual who are avoiders in the absence of minimum wage policy. The second impact is that the minimum wage will have an impact on the search decision of workers with an offer above $w > \underline{w}$. Take the example of an agent with a belief $b$ and a wage offer $w \geq \underline{w}$. For such an individual the payoff to employment is unchanged or (5). On the other hand, the payoff to search for such an individual is given by

$$V^*(b, \underline{w}) = \beta \int_{\underline{w} - b}^{\infty} (b + \epsilon) f(\epsilon) d\epsilon + \lambda \{v(b) + \beta E[v(b')|b, \underline{w}]\}. $$

\textsuperscript{24}Unemployment insurance here does not protect the self-esteem of an agent, it only provides more incentive to search.

\textsuperscript{25}Again we assume $z$ and $R$ which make handicapping and staying at home unattractive.
Consider $E[v(b')|b, w]$ and the fact that the expected value of $b'$ depends on the minimum wage. Without a minimum wage, an agent who receives a low offer has to update $b$ accordingly. This is avoided with a minimum wage law for any $w < \tilde{w}$. Consequently, minimum wage law will cause the agent to put less weight on the new signal (lower $k$), since such a signal is now less informative. In other words by eliminating very low “insulting” wage offers it provides some protection for the individual’s self-esteem which in turns allows the individual to undertake psychologically risky but materially beneficial actions. In the limit, for example, if $w \to \infty$, all agents get a wage offer of zero, and the signal is not informative. In such an environment, all the weight is put on the initial belief ($k \to 0$), and so $E[v(b')|b, w] = v(b)$. To summarize, since $v(\cdot)$ is concave, an increase in $\tilde{w}$ implies that $v(b) - E[v(b')|b, w]$ falls.

The reservation wage is given by:

$$\hat{w}_R(b, \tilde{w}) = \frac{\beta}{1 + \beta} \left( \int_{w-b}^{\infty} (b + \epsilon) f(\epsilon) d\epsilon - \lambda \{v(b) - E[v(b')|b, \tilde{w}]\} \right).$$

An increase in the minimum wage has an ambiguous effect on the reservation wage. One the one hand, it reduces the expected wage an agent will receive by searching, by transforming all those low wages ($w < \tilde{w}$) into a no offer ($w = 0$). This is the standard effect and one reason many economists would view minimum wages as a bad idea. But on the other hand, it reduces the risk in terms of self-esteem associated with taking another signal.

Overall the total impact of minimum wage is uncertain, but it is conceivable that minimum wage policy both improves the expected material payoff through increasing search and the self-esteem component of the utility through making search less informative.
5 Conclusion

We have studied individuals who are sensitive to self-esteem in the economically relevant environment of the labour market. We showed that with sensitivity to self-esteem and strict concavity of the mapping from beliefs to utility (e.g. risk aversion) that there will be a set of individuals who are situation avoiders. The individual’s expectation about their future belief regarding ability is their current belief, but with the introduction of risk aversion, the individual by avoiding the situation trades off expected material benefit for certainty on self-esteem. The implications are that those individuals who avoid the situation will learn less about their true ability and on average be materially poorer. These suggest that individual sensitivity to self-esteem may lead to a lower standard of material well being in a society. We showed that the incentive to avoid will increase with the individual’s patience and the degree of sensitivity to self-esteem. With prudent individuals we showed that the incentive to avoid will be non-increasing in self-esteem.

We then introduced the possibility of self-handicapping. Here we showed that if the self-handicapping damage to ability is positive but less than the risk premium at some level of belief about ability, then situation avoiders and self-handicappers will co-exist. Consider a given low initial wage as we increase self-esteem. We moved from individuals who take employment to situation avoiders to self-handicappers and if the risk premium is decreasing in self-esteem, to those who search for a new job without self-handicapping.

We next considered downward comparison. With potential strategies like self-handicapping or avoiding the situation, given the information set, individuals update truthfully (Bayesian). But the individual takes actions which manipulate the information set. Avoiding the situation could be descriptively labeled
avoiding the truth. But, strategies like downward comparison or defensive pessimism seem to go further. It is as if the individual avoids some information but not other information in biasing their assessment. We then showed that an upwardly biased belief is best for a prudent individual who is sensitive to self-esteem. We went on to show that an upward biased prior also increases material well-being of the individual when the individual is sensitive to self-esteem. In this case the upward biased belief leads the individual to avoid other materially damaging strategies such as avoiding the situation or self-handicapping and thus can increase material well-being.

Finally, we considered imprudence in exploring defensive pessimism. We showed that if the individual is not prudent an inaccurate downwardly biased prior can increase the individual’s ex-ante expected utility. This is a surprising result because utility is increasing in self-esteem so that lowering your belief directly lowers your self-esteem and utility. The logic of the result is that with imprudence self-handicapping occurs among high self-esteem individuals. So that lowering the individual’s belief increases utility indirectly by allowing the individual to avoid materially damaging strategies like self-handicapping. Further the individuals with defensive pessimism in our model are the high ability individuals.

We closed by briefly considering some policy considerations which arise from labour market search with self-esteem.

6 Bibliography


Benabou, R., and J. Tirole (2002a) “Self-Confidence and Personal Motiva-


Figure 3A
Figure 3B