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PAUL DOLAN and MATHEW WHITE

**DYNAMIC WELL-BEING:  
CONNECTING INDICATORS OF WHAT PEOPLE  
ANTICIPATE WITH INDICATORS OF WHAT THEY  
EXPERIENCE**

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**ABSTRACT.** There are many indicators of a person's well-being that could be used for policy purposes. Few would argue that any single indicator of well-being is appropriate in all contexts and, increasingly, social scientists are attempting to integrate the various indicators. Further successful integration depends on understanding how the various indicators of well-being relate to one another in a dynamic way. This paper attempts to connect indicators of what people anticipate to indicators of what is actually experienced and, in so doing, inform the normative debate about the appropriateness of different indicators in policy contexts.

**KEY WORDS:** happiness; moment utility; predicted utility; social indicators; subjective well-being; remembered utility

**INTRODUCTION**

A common goal of policy makers in domains such as health, education and the economy is to improve the well-being of the general population. However, there are many economic, psychological, and social indicators of a person's well-being, each with a long history and many merits (Argyle, 1999; Diener and Suh, 1997; Frey and Stutzer, 2002; Michalos, 2004). Thus one of the challenges facing policy makers lies in knowing which indicators to use in any given context. In the health domain, for example, there is considerable debate about whether policy should be informed by the preferences of healthy members of the general public imagining themselves in different health states or on the reported experiences of patients in those states (Menzel et al., 2003).

If the different types of well-being indicator produced the same results, the normative question of which indicators to use for policy purposes would be restricted to practical considerations such as costs of data collection. However, different indicators produce different results. For example, predicted well-being is often quite different from subsequently reported experience, and people do not always seem to be very good at knowing what will make them happy (Kasser and Ryan, 1993, 1996; Wilson and Gilbert, 2003). Wealth, an economic indicator, is less than perfectly correlated with life satisfaction, a psychological indicator, and neither is linearly related to social indicators such as health and marital status (Argyle, 1999; Diener, et al., 1999; Easterlin, 2001; Inglehart and Klingeman, 2000). And even personal recollections of earlier well-being are sometimes at odds with the person's own 'moment-to-moment' accounts of well-being: people appear to forget how long certain pleasures and pains lasted for (Kahneman, 2000). The fact that the different indicators suggest different levels of well-being means that the policy maker must choose which indicator(s) to give most weight to.

This paper sets out a framework that aims to integrate the various economic, psychological and social indicators in a way that provides greater clarity to policy-makers about what exactly it is they want to measure. In so doing, our approach is very much in keeping with recent calls to end the "turf battles" (Diener and Suh, 1997, p. 214) between those who use different well-being indicators. According to our framework, well-being is viewed as a temporal and iterative process, and the various indicators are essentially tapping into well-being at various stages in this process. We refer to this holistic approach as Dynamic Well-Being (DWB). Our approach focuses squarely on the possible relations between different well-being indicators and thus the discussion of "stages" of well-being is primarily related to the temporal order of indicators rather than a reflection of theoretical boundaries in well-being processes *per se*. Nonetheless, the stages developed in this manner have a number of similarities to more theoretical perspectives, such as the Model of Action Phases (Heckhausen, 1991).

In the following section, we outline the main stages of the proposed framework and highlight the processes and outputs involved at each stage and how these outputs can be used as indicators of well-being. Once the basic model has been proposed, and all stages and

outputs have been introduced, some of the relative merits and problems of using indicators from each stage are discussed, first considering what information is provided at each stage (in section “The well-being information provided at each stage”) and then looking at the available methods for measuring well-being (section “The methods used to tap in to well-being at each stage”). Section “Choosing between indicators in a policy context” applies the model and the discussion about the merits of indicators at each stage to a particular policy context; namely, the allocation of health care resources. Finally, the section “Concluding remarks” provides some concluding comments and discusses possible avenues for further research.

#### AN INTRODUCTION TO THE SIX STAGES OF DYNAMIC WELL-BEING

The six stages proposed by the DWB approach are: (i) the anticipation stage, (ii) the planning stage, (iii) the behaviour stage, (iv) the outcome stage, (v) the experience stage and (vi) the evaluation stage. Since the evaluation stage feeds into the anticipation stage, the process is an iterative one. An overview of the process and stages of DWB is shown in Figure 1. This figure represents a single turn of the ‘wheel’ for a single individual and overall well-being may be related to many iterations of the process, or any number of ‘wheels’ across society. In outlining this approach, we are primarily concerned with discussing the information that is contained within each stage and with the methods that can be used to tap into well-being at each stage. We start with the anticipation stage simply because, ultimately, as organisms, we begin life by having needs and desires that we must satisfy (Maslow, 1954/1970).

(i) *The anticipation stage.* At the anticipation stage, people consider the nature, valence, intensity and durability of their reactions to various potential outcomes and events that might occur in the future (Loewenstein and Schkade, 1999). In particular, they consider whether something will make them happy or satisfied (or unhappy or dissatisfied), by how much and for how long. Wilson and Gilbert (2003) refer to these various processes under the collective heading of

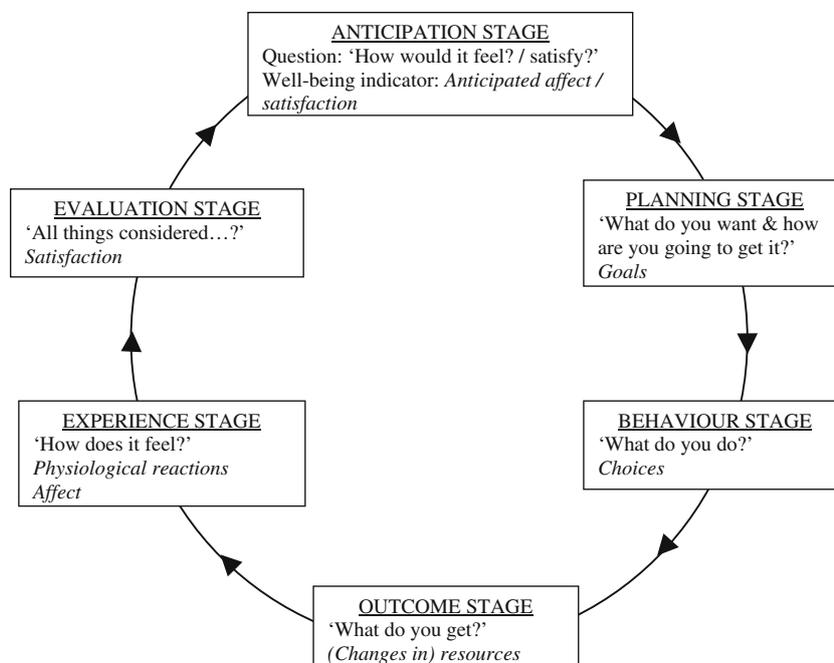


Figure 1. Stages in dynamic well-being (DWB).

*affective forecasting* and suggest that considerations will be based both on personal past experiences and information from others about outcomes one has yet to experience oneself.

To the extent that an outcome is relatively frequent and familiar, predictions may be relatively automatic and unconscious, for example, a trip to the dentist. Rarer or unfamiliar outcomes are likely to require greater consideration and cognitive effort because there is less information to draw on about one's reactions to certain events, for example, anticipated quality of life following a major change in health status. The *predicted utility* (Kahneman, 2000) at this stage can be divided into two types: *anticipated affect* or *anticipated satisfaction*. The former refers to immediate affective reactions to changes in circumstances (e.g. "how would you feel if you won the lottery?"), whilst the latter refers to considerations of longer-term consequences (such as "how would a lottery win affect the rest of your life?"). This assessment of life satisfaction could extend beyond how pleasurable one's life is to include considerations of how meaningful one's life is (Peterson et al., in press).

Anticipated affect and satisfaction are typically tapped into by self-reports. In most psychological research, the measures are pretty direct in the sense that people are asked how happy they think a certain outcome would make them (Loewenstein and Schkade, 1999; Wilson and Gilbert, 2003). Economists, however, have sometimes used more indirect approaches. For example, health economists have asked people to trade-off a longer life in poor health against a shorter life in full health in order to estimate the values of various conditions and states of health (Dolan, 2000).

(ii) *The planning stage*. At the planning stage, people think beyond the anticipated effects of a particular event or outcome and also take into consideration the likelihood of its occurrence, particularly in relation to one's own actions and behaviour. In other words, consideration of potential future outcomes at this stage reflects expectancy-value processes (e.g. Ajzen, 1988), principally in relation to perceptions of self-efficacy and control (Bandura, 1982). For outcomes that people feel they have some degree of control over, people will attempt to increase the likelihood of outcomes associated with positive well-being by adopting *approach goals*, and attempt to reduce the likelihood of outcomes associated with a reduction in well-being by adopting *avoidance goals* (Higgins, 1999). Other classifications have focused on the various life domains that goals can be associated with, for example, health, status, personal relationships (Deci and Ryan, 2000) and on the types of costs and benefits associated with the outcomes for each of these domains, e.g. intrinsic versus extrinsic rewards (Dweck and Leggett, 1988).

Once goals have been chosen or set on the basis of the predicted utility, likelihood and controllability of the associated outcomes, a person also needs to decide upon how to implement these goals. This part of the planning stage will involve more specific consideration of what behaviours are necessary for the achievement of goals, when these behaviours should be carried out, how often they should be carried out and so on (Gollwitzer, 1990). Although this seems to require highly deliberative processes, it is claimed that goal striving can be a relatively automatic process, especially when clear plans are initially made on exactly how intentions are to be implemented.

Again, the primary method for collecting information about goals, as an indicator of well-being, is to rely on self-reports. However, self-reported goals are generally subsequently categorised by researchers

into approach/avoidance goals, intrinsic/extrinsic goals and so on (e.g. Cantor and Sanderson, 1999; Kasser and Ryan, 1993), so the process of assessment is perhaps more indirect than for anticipated affect and satisfaction and relies more on the judgement of the researchers.

(iii) *The behaviour stage*. The behaviour stage of the well-being process is where people attempt to implement their goals and at the same time respond to unexpected or unaccounted for external influences and situations. To the extent that people's behaviour is a product of their goals, rather than contextually forced, we can say that one of the outputs of the behavioural stage is the particular *choices* that people make (Tversky and Griffin, 2000). Choices are principally indirect indicators of anticipated affect, anticipated satisfaction and goals, and as such can be used to assess current and anticipated well-being in much the same way as these other outputs.

Clearly, in terms of the method for collecting data on choices, observation by external parties is one option, as with consumer spending patterns. However, it is also true to say that much market research on choices, for example, also relies on self-report data about what people report choosing in the past or on a regular basis. In other words, choices can also be assessed directly, through observation, and indirectly through self-reports.

(iv) *The outcome stage*. The outcome stage is characterised by an interaction between the outputs of the behaviour stage and a range of further influences beyond the individual's control: a person may choose to buy a lottery ticket in the belief of anticipated satisfaction should they win but this, of course, has no influence on the numbers that are drawn and thus their behaviour is largely irrelevant with respect to who wins the lottery. Other behaviours, like getting married, are more directly related to specific outcomes.

The outputs at this stage are the kinds of tangible and intangible *resources* – income, health, education, marital status, employment etc. – used as indicators of well-being in the social-indicators tradition (Diener and Suh, 1997; Michalos, 2004). Viewing well-being as a process also highlights the importance of *changes in resources* as well as the level of resources. For example, a simple examination of someone's earnings for the current year provides some information about their standard of living but knowing whether this was an increase or decrease on last year's income provides us with

additional information. Moreover, knowing whether this increase or decrease was a direct result of the person's own choices or behaviour, or was due to external influences beyond their control, provide further information about well-being.

(v) *The experience stage.* The experience stage is characterised by the immediate physiological and psychological reactions to changes in resources at the outcome stage. For example, what happens when a person learns that they have just won the lottery (change in income) or that they need to go on dialysis (change in health status), or immediately after they say "I do" (change in marital status)? Of course, people are undergoing experiences of one kind or another at each of the other stages in the DWB process, but we choose the term for this stage following Kahneman (1999, 2000; Kahneman et al., 1997), who referred to the psychological reactions following an event as 'experienced utility'.

There are various physiological processes at work at this stage, as witnessed through the number of different techniques used to measure them, such as the collection of event-related brain potentials (ERPs, Davidson, 2000; Tiffany and Cacioppo, 1999), monitoring of the autonomic nervous system (Cacioppo et al., 1993; Sapolski, 1999) and observation of reflexive approach/ avoidance reactions (e.g. Bargh and Chartrand, 1999). We refer to the outputs from these measures as *physiological reactions*.

Psychological reactions have been measured through the use of self-report techniques that focus on asking people how they "feel right now". These 'on-line' approaches are often used to observe changes in spontaneous emotional reactions over both relatively short periods of time, such as during an operation (Redelmeier and Kahneman, 1996) to longer periods such as an entire day (e.g. the Day Reconstruction Method, Kahneman, et al., in press) or even several days (Experience Sampling Method, Csikszentmihalyi, 1990). Stone et al., (1999) discuss using such approaches in tandem with physiological measures to provide what they refer to as Ecological Moment Assessment. We refer to the psychological outputs of this stage as *psychological affect*, to reflect the fact that these measures are primarily concerned with spontaneous feelings and emotions.

(vi) *The evaluation stage.* Finally, at the evaluation stage people provide considered assessments of their well-being which typically involves an evaluation of how pleasurable and meaningful their life is,

usually in relation to some comparison standard. Michalos (1985), for example, argues that psychological well-being or life satisfaction is largely determined by the multiple comparisons people make between the current situation and previous experiences of a similar nature, prior expectations (i.e. anticipated affect), prior aspirations (i.e. goals), as well beliefs about what would have been fair, what has been achieved by others and what will happen in the future. In other words, at the evaluation stage people make retrospective and prospective temporal comparisons (Wilson and Ross, 2000), social comparisons (Suls and Wheeler, 2000; see also work on relative deprivation, e.g. Runcimann, 1966), and counterfactual comparisons, i.e. comparisons of the current state with hypothetical alternatives (Olson et al., 2000).

This stage is characterised by *satisfaction* both in relation to any given domain specific state or change, such as satisfaction with current health, education etc. (van Praag et al., 2003), as well as with life more generally across all domains (Diener et al., 1999). The methods for tapping into these outputs are largely self-report based such as the well-known General Social Survey (GSS), which uses both domain specific questions such as “How do you feel about your health?” and more global questions, such as “How do you feel about your life as a whole?”

Satisfaction is likely to be higher if the present hedonic experience (i.e. affect) is perceived to be better than that of previous situations, to exceed expectations, to fulfil aspirations, to be better than that experienced by others, and to be fair (Michalos, 1985). It is also likely to be higher when the outcomes were influenced by one’s own actions and the process has helped to provide meaning and understanding of life or has helped improve social relations (Deci and Ryan, 1985, 2000). It is worth making the point here that current satisfaction will subsequently influence the anticipated affect and satisfaction of future outcomes at the next anticipation stage.

#### THE WELL-BEING INFORMATION PROVIDED AT EACH STAGE

So, if we view well-being as a dynamic process rather than as an objective set of circumstances or a particular state of mind at a

specific point in time, then the outputs at each of the six stages can be used as indicators of well-being. But what are the relative strengths and weaknesses of indicators at the various stages in the process? In order to answer this question, we first need to consider the usefulness and reliability of the information provided at each stage, and then to look at how existing indicators tap into this information.

Information provided at the anticipation stage is important for understanding well-being at later stages. For example, without understanding anticipated reactions to events at the anticipation stage, we would not be able to understand goals or behaviours because we would not know why people selected these goals and behaviours in the first place (March, 1978). Moreover, as was noted earlier, there is widespread agreement that psychological satisfaction with various objective outcomes is highly dependent on the relationship between what is anticipated and what is subsequently experienced (e.g. Michalos, 1985). There is also evidence that people who are optimistic about the future appear to be happier in general than pessimists, and that the act of being optimistic about a particular outcome is itself an indicator of current positive affect (Seligman, 2002).

However, in their extensive review of the literature on ‘affective forecasting’, Wilson and Gilbert (2003) concluded that, whilst we generally predict the valence and type of emotion from an event reasonably well, we seem to overestimate both the strength of these emotions and how long they will last for (for a classic example see Brickman et al., 1978). Specifically, it seems that people fail to recognise the importance of adaptation processes, and fail to appreciate the power of the ‘psychological immune system’, which helps us to make sense of both good and bad events (Wilson and Gilbert, 2003). Overestimating the strength and duration of affect might also be due to people holding faulty implicit theories about what causes their well-being to change (Loewenstein and Schkade, 1999). In particular, people might put too great a weight on external factors associated with changes in their tangible resources, such as their income, housing etc. and not enough weight on the role of internal processes that we take with us into the environment, such as our personality (Diener, 1984).

In addition, assessments of future well-being also tend to “focus” the person’s attention to consider one domain to the neglect of others

(Gilbert et al., 2002). For example, Dunn et al. (2003) were able to reduce the impact of visual attractiveness of housing on predictions of future well-being from accommodation by alerting participants to the importance of friendships in unattractive locations. Related to this is the possibility that responses reflect immediate affective reactions to the question (Wilson et al., 2002) and this is consistent with the observation that moods can have a strong influence on perceptions and judgements (Morris, 1999; Schwarz et al., 1987). Thus, while the focusing effect suggests that people might be being channelled to think only about certain aspects of the future, this possibility suggests that they might even be channelled away from thinking about the future and towards focusing on current feelings. The apparent failure to take account of adaptation might, from this latter perspective, be a product of the way in which current emotions intrude on assessments of the future rather than any fundamental failure to appreciate adaptation processes.

There are a number of reasons why information about goals at the planning stage is important for understanding well-being, and these are similar to the reasons at the anticipation stage. To the extent that avoidance goals are linked to pessimism and approach goals to optimism, we might want to use this distinction to make inferences about current psychological well-being i.e. it may be possible to conclude that someone who sets a large number of avoidance goals has lower psychological well-being than someone who sets a large number of approach goals. Information about goals can also help us explain future behaviour and choices in addition to psychological reactions to events and outcomes. For example, research suggests that the attainment of some goals, i.e. ones with extrinsic rewards such as status, is associated with lower self-reported psychological well-being than the attainment of others, i.e. ones with more intrinsic rewards such as feeling of competence or mastery (Kasser and Ryan, 1993, 1996).

Goals can also provide a potential indirect indicator of objective well-being in a similar way to the outputs from the previous stage. If a person is mainly striving (Emmons, 1986) to obtain food and shelter, we might infer, from a 'need satisfaction' perspective, that their standard of living is lower than if their main strivings are for greater status and marital satisfaction (Maslow, 1954/1970; Oishi et al., 1999). As Maslow (1954/1970) puts it: "For our chronically,

and extremely hungry man, Utopia can be defined simply as a place where there is plenty of food... But what happens to man's desire when there is plenty of bread? At once other needs emerge and these, rather than physiological hungers, dominate the organism" (p. 37).

However, goals can occur at various levels of abstraction and it is not always obvious which level any specific goal is related to. For example, a goal to eat healthier foods may reflect an attempt to combat malnutrition (a relatively concrete goal reflecting low objective well-being) or it may reflect an attempt to lose weight in order to conform to cultural norms about appearance (a more abstract goal that may actually reflect substantially higher levels of objective well-being). The same goal may also be associated with multiple means (Kruglanski, 1996). The relatively abstract goal of improving self-esteem, for example, can be achieved in many different ways. So, for example, we may erroneously come to the conclusion that the person with the goal to eat more healthily has lower well-being than the person who has the goal to learn the guitar, despite the fact that both goals are really about improving self-esteem and thus may not reflect differences in underlying well-being at all. In short, interpretation of well-being from goals is far from straightforward.

Economists often use *revealed preferences* (Starr, 1969) at the behaviour stage to infer the values attached to a range of market and non-market goods – on the assumption that “a person is ... better off in State A than in State B if he or she chooses State A over State B” (Tversky and Griffin, 2000, p. 721). A consumer who chooses a bundle of goods in any budget situation reveals his preference for that particular bundle over all others available under that budget constraint (the ‘budget’ here can relate to a range of scarce resources, like time, as well as income). So, consumer expenditure patterns and the choices we make about how to use our time could be used to make inferences about what intrinsic needs are being met (or are still to be met) and/or what goals are being satisfied (or are still to be satisfied). Kahneman (2000) refers to the use of choices as a well-being indicator in this way as *decision utility*.

In addition, the mere act of choosing could be indicative of well-being in its own right, and not simply because it acts as an indirect measure of need satisfaction. Such a perspective is in accordance with the notion that autonomy, or the freedom to choose, is important for

well-being (Deci and Ryan, 2000) and evidence that life satisfaction in countries with fewer political freedoms tend to be lower than in ones with greater political freedoms with comparable levels of *per capita* income (Inglehart and Klingeman, 2000). Thus, from this perspective, it is not necessarily behaviour *per se* that is an indicator of well-being, but the degree to which behaviours are voluntary and chosen or the product of environmental constraints.

However, underpinning well-being as preference satisfaction is the belief that choices reflect preferences. However, there are at least two fundamental problems with such an assumption. First, it implies that an observed choice actually reflects a person's real preferences rather than, as may be the case, their response to exogenous factors, such as cultural norms or situational pressures. Second, even if we assume that people are acting according to their own wishes, using revealed preferences as measures of well-being also assumes that people know what's good for them. But it is an "undeniable fact that people sometimes prefer, of two alternatives, the one that is worse for them, because they are misinformed about the merits of the alternatives" (Broome, 1991). Many economists would therefore require that preferences are suitably 'corrected' for mistaken beliefs but, as we have just seen, this is far from straightforward.

Resources and changes in resources at the outcome stage can be used to indicate well-being directly. For example, by examining an individual's health and income, we can make a fairly direct assessment about the degree to which their basic needs in these domains have been met. However, an evaluation of the degree to which other needs are met, such as the needs for autonomy, achievement or social relationships (Deci and Ryan, 2000; Maslow, 1954/1970) can again only be indirectly inferred from resources such as political freedoms, educational achievement and marriage, for example. The resources present at the outcome stage also provide an indication of the potential for future need satisfaction as well. According to Sen (1987), for example, we care about outcomes like health and education because they contribute to people's functionings and capabilities, which enable them to 'flourish' as human beings (see also Veenhoven, 2000).

However, there are questions about which resources to use to best represent well-being. If the answer to this question is 'those that are most directly related to subjective well-being', then information at the outcome stage only serves as a proxy for something

else of value. The outcomes could be considered important for other ends, as Sen argues, or even important in their own right, but this raises important questions about who is to decide what is important, and on what basis. And there is, of course, no guarantee that the chosen set of outcomes will reflect what people actually feel about their own lives.

Information provided at the experience stage (through either the measurement of physiological reactions or psychological affect) gives us access to how people feel on a moment-to-moment basis. This might be important for considering how mood changes through the day or as a result of engaging in different activities (Kahneman et al., in press). Kahneman (1999, 2000) argues that psychological affect provides information on what he has called “objective happiness” because the information is free from some of the biases and comparison processes that have already been outlined in relation to the anticipation and evaluation stages. Moreover, to the extent that patterns in brain scans from physiological reactions are correlated with self-reported affect, some researchers suggest that the physiological indicators can also act as some form of objective indicator of well-being (Kahneman, 2000).

However, Dar et al. (1995) found that what war veterans regarded as painful (in terms of the length of time they were able to hold their fingers in hot water) was negatively correlated with the severity of injuries they had previously suffered. In other words, there appears to have been an automatic comparison of current experiences with past experiences below conscious awareness (Loewenstein and Schkade, 1999). And, while it may seem that physiological indicators are perhaps even more objective than instantaneous self-reports, ultimately we can only assess their worth in measuring well-being by knowing how they relate to the self-report measures in the first place. So, for example, we only know about the lateral asymmetry of emotion in the pre frontal cortex (Davidson, 2004) because people say they are happy or sad when there are different patterns of activity in these regions of the brain.

Information about well-being at the evaluation stage is useful in understanding and explaining future well-being, and this highlights the temporal and iterative nature of our model. Our memories of certain events, and our overall evaluations of them, are largely responsible for how we anticipate the effect of those events in the

future, and whether we adopt goals that lead us to approach or avoid those events. Our evaluations also directly affect the alternatives we seek and their anticipated consequences. So, for example, Wirtz et al. (2003) found that the anticipated satisfaction associated with repeating a recent holiday in the future was associated more highly with the overall level of satisfaction with the initial trip as reported after the holiday had finished than with the profile of psychological affect monitored throughout the holiday itself.

However, even though a person may experience high levels of positive affect following a particular event, it may nevertheless be associated with dissatisfaction if it failed to live up to one's anticipations (e.g. "I thought it would be even better") or was inconsistent with one's moral beliefs (e.g. "It felt good at the time but I regret it now"). Similarly, negative affective experiences may even be associated with satisfaction if they are compared to more extreme counterfactuals (e.g. "It could have been much worse"), or if people are able to find meaning in the event which triggered the affective state (e.g. "I really needed that to happen to make me realise the mistakes I was making"). And although the emphasis here has been on comparison processes that appear to be quite deliberative and conscious, there is every reason to suppose that many of these comparisons are relatively heuristic, require little cognitive processing and may even occur below conscious awareness (Mussweiler, 2003).

#### THE METHODS USED TO TAP INTO WELL-BEING AT EACH STAGE

The main way in which information is gathered at the anticipation and planning stages is through the use of self-report data. This is also true, of course, for psychological affect at the experience stage and domain and general life satisfactions assessments at the evaluation stage. While there is little need to re-review the extensive literature on the potential problems of self-reports in this area (for a good review, see Schwarz and Strack, 1999), it is important to remember that these reports are unlikely to reflect "a stable inner state of well-being. Rather they are judgements that individuals form on the spot, based on information that is chronically or temporarily accessible at that

point in time, resulting in pronounced context effects.” (Schwarz and Strack, 1999, p. 61). Examples of these context effects include question order (Schwarz et al., 1991) and even the weather (Schwarz and Clore, 1983).

However, in defence of self-reports, there is also evidence of stability over time and across contexts (Diener and Larsen, 1984), as well as evidence of convergence between self-reports and ratings by significant others (Lepper, 1998; Sandvik, et al., 1993) and even minimally trained observers (Redelmeier and Kahneman, 1996). Thus, it may be that some of the very real limitations of self-report data at the various stages can be attenuated, at least to some extent, through good research methodology.

Well-being at both the behaviour and outcome stages can be observed by others and does not rely on self-reports. This means that data can be collected relatively easily and cost effectively, which is a particularly important consideration for longitudinal and cross-cultural studies. Indicators at the outcome stage, such as health, income, education and marital status – and the various changes in these – have the advantage that they may reflect “normative values of a society” that might not necessarily be linked to self-assessed well-being (Diener and Suh, 1997). For example, access to open countryside may be an important indicator of a society’s well-being but may not feature heavily in some individuals’ considerations when asked if they are satisfied with their life. Furthermore, some people may be entirely happy with their life or their circumstances yet others may consider them to be have such low levels of health, education etc. as to warrant public provision of certain services that are designed to improve particular outcomes. Thus, outcome indicators have the advantage that they can disregard the fact that people may cope with and adapt to conditions in ways that public policy may legitimately wish to ignore.

The most obvious advantage of physiological indicators at the experience stage is that they appear to offer direct access to emotions, unmediated by cognitive evaluation and motivated communication processes. In particular, they provide useful benchmarks for examining the reliability and validity of self-report measures. However, while such research has clearly opened up a number of fascinating avenues with regard to the physiology of emotion, a number of problems remain. First, although many of these techniques are able

to discriminate between positive and negative states, finer discriminations between exact emotions and their intensities (to the extent that they are important for policy) are generally much harder to assess. Second, the cost and time needed to collect such measures is much larger than self-report questionnaires or interviews (Larsen and Fredrickson, 1999), and their widespread adoption for applied research would need to provide significantly superior results to justify the extra costs. Third, many of the techniques are invasive and can lead to specific emotional reactions of their own, such as anxiety or fear, over and above those of interest. That is to say, just as context effects exist for self-reports, so they can also have an influence on physiological indicators.

The measurement of psychological affect is attractive to those, like Kahneman, who favour measuring the total utility from affective responses during an event but, as noted above, even 'objective happiness' may still be situationally dependent and may reflect important individual differences. Moreover, since psychologically experienced affect is still primarily tapped into using self-report methods (e.g. the ESM and DRM) some of the problems of these approaches may also exist at the experience stage. We note, for example, that in the study by Csikszentmihalyi and Hunter (2003), only participants who provided 15 or more out of a possible 56 responses were included in the study. Although actual Ns and means were not provided for these two groups, it is clear that people do not report on a significant number of time points and we can't rule out the possibility that, in some instances at least, this reflects a desire to withhold information about affective reactions to certain events. In other words, 'on line' accounts of well-being are only as good as people are prepared to let them be.

Indicators of well-being at the evaluation stage i.e. domain and life satisfaction, are again largely self-report in nature. Leaving the problems of self-report on one side, the key factor is whether the comparison processes that occur at this stage are seen to be an important aspect of well-being in their own right or unhelpful distortions of some 'objective happiness' experienced at the experience stage (Kahneman, 2000). For example, Kahneman and colleagues have observed that people's assessments of how painful an operation was, tended to ignore the duration of the pain and was instead mainly influenced by the most painful instance during the operation (i.e.

peak level) and the level of pain at the very end of the operation (for a review, see Kahneman, 2000). Based on these findings, it was proposed that people were using a heuristic referred to as the 'Peak-End-Rule' instead of the full data set of experiences, and this rule appears to be viewed by these authors as an error, which renders the outputs of the evaluation stage to be less useful than those at the experience stage.

However, from a different perspective, the fact that we are able to buffer ourselves from the full duration of negative experiences may actually be considered as one of the positive outcomes of our 'psychological immune systems' (Wilson and Gilbert, 2003). Moreover, eudemonic aspects of well-being such as meaning and feelings of competence and autonomy are unlikely to be simple outcomes at the experience stage but rely, at least to some extent, on various deliberative and reflective processes. The outputs of this stage, rather than those of any other, are what many lay observers would automatically associate with their own conception of well-being and thus these outputs can not be dismissed too readily.

#### CHOOSING BETWEEN INDICATORS IN A POLICY CONTEXT

So, given these considerations, which stage in the well-being process is it 'best' to tap into? The short answer is all of them since they each represent an important stage in the dynamic process of well-being. Of course, this still leaves open the question of what weight should be given to each stage. But it is impossible to answer this question without specifying the purpose to which the measures of well-being will be put. Measurements of well-being can and do have many purposes, for example, to assess change over time, to compare well-being across communities, to measure the distribution of well-being in society, and to prioritise between different people or programmes when determining how best to use scarce public resources. It is the last of these purposes that we consider here; in particular, how we might evaluate changes in well-being associated with a significant loss of vision in order to decide the priority given to its prevention and cure vis-à-vis other health conditions. Of course, we

believe that the model can be applied to many areas other than this and we only use this example to show how it might be extended from the more theoretical discussion so far to the more applied considerations of policy makers.

How the DWB approach can be applied in this health policy context is shown in Figure 2. At the anticipation stage, 'healthy' people consider their well-being in the event of significant vision loss or people who have already experienced such a loss think about their future given the changes in their vision. As noted earlier, health economists have asked such questions in relation to a range of health conditions using health state valuation methods that ask people to make various trade-offs about their future life expectancy and health prospects (Dolan, 2000). The received wisdom amongst many health economists is that the preferences of the general public should be used to inform health policy, primarily on the grounds that, since the public bears the costs associated with resource allocation decisions, they ought also to have some say in the determination of the benefits (Gold et al., 1996). This is also the view that underpins the 'insurance principle'. That is, the preferences used to determine coverage patterns should be those of the potential beneficiaries as determined in anticipation of any need (Hadorn, 1991). Moreover, if one of the purposes of policy interventions is to give reassurance to the public by targeting those events they fear, then knowing exactly what it is they fear most is imperative (Edgar et al., 1998). In other words, for policy purposes at least, it may be important to allocate resources on the basis of anticipated affect and satisfaction that again suggests that these outputs are potentially important well-being indicators in their own right.

We saw in section "The well-being information provided at each stage", however, that people are not very good at predicting the intensity and duration of their reactions to events and there is now plenty of evidence to suggest that people overestimate the losses from detrimental health changes (Ubel et al., 2003). A question asking how well-being might be affected by a loss of vision draws the person's attention to the health domain rather than to other domains such as personal relationships, career prospects, and so on, all of which may be unaffected, or even enhanced. It also focuses attention on the transition immediately after the diagnosis (Kahneman, 2000) rather than on the longer-term consequences of living with a loss in vision.

The *ex ante* (i.e. before the outcome) valuation of vision loss may therefore pick-up preferences that are affected by what we here propose to call a 'Peak-Start Rule'. While the 'Peak-End-Rule' is concerned with retrospective duration neglect, the 'Peak-Start-Rule', if used, would suggest that people make prospective duration neglect as well. That is, people focus on how they will feel initially and what their peak (negative) experience will be like rather than on how long such experiences will last and changes in emotional intensity over time. This possibility appears to be consistent with the affective forecasting literature.

Assessments of well-being at the planning stage would bring in the perceived likelihood of experiencing vision loss as well as its perceived consequences and would look at the avoidance goals that people adopt in order to reduce their chances of experiencing the loss. For example, do people plan to make regular visits to opticians for glaucoma screening? The costs of such goals could then be used to measure losses in well-being from the worry of vision loss. Interestingly, worry or fear about poor health does not play much part in the evaluation of health care interventions (although there are emerging topics such as the value of reassurance provided by screening). Contrast this with the fear of crime, for example, the reduction of which is an explicit objective of the UK government (see <http://www.homeoffice.gov.uk/inside/aims/index.html>).

There would seem to be two main reasons for evaluating people's worry or fear about potential health states, such as vision loss. First, worry has a very real effect on an individual's subjective sense of well-being – and on her behaviour, including her consumption. Therefore, public policy aimed at improving an individual's well-being should take account of the losses she experiences from her worries. And second, reducing an individual's worry might represent a very cost-effective means of improving her well-being through public policy.

There are also two main reasons for disregarding, or at least playing down, worries about various negative health states insofar as public policy is concerned. First, many worries are based on a misrepresentation of the statistical risks (e.g. Lichtenstein et al., 1978). In some cases an individual's level of worry may overstate the actual likelihood and/or consequences associated with a particular negative health state and, arguably, public policy should not be based on such misconceptions. And second, it is quite possible that people have

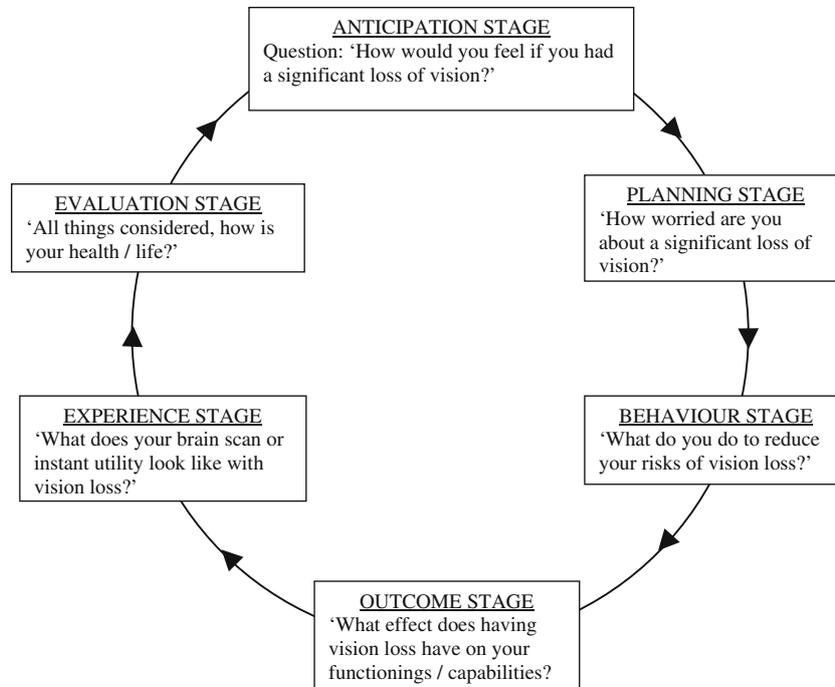


Figure 2. Well-being indicators in relation to loss of vision.

some equilibrium (and perhaps optimal) level of worry that is insensitive to policy. This possibility is reminiscent of the risk homeostasis hypothesis that argues, for example, that improving safety measures in vehicles only serves to encourage people to drive less carefully (Adams, 1995).

At the behaviour stage, we would look at people's revealed preferences in relation to choices that involve some prospect of experiencing vision loss. For example, do people actually put into practice their plans to visit the optician? More broadly, there have also been some attempts to value mortality and morbidity losses from people's job choices by controlling for a range of factors that affect wages and then attributing any residual differences in wages across jobs to the different risks of death or injury (such as loss of vision) across those jobs (Viscusi, 1993). In this way, it is possible to estimate the trade-off between higher wages and a higher risk of death or injury and, in so doing, to calculate the monetary value of a statistical life. However, comparisons of such estimates of implicit values of life show wide

variations across different contexts (Viscusi's own review showed an implicit value of preventing a fatality ranging from £0.05 million to £2.5 million). This is primarily due to the fact that very few markets, let alone labour markets, operate in the ways that economics textbooks assume, for example, transactions are rarely impersonal, and there is often only a small number of buyers. In addition, and notwithstanding these and other market failures, workers are often not very well informed about the risks they face. Therefore, attempts at inferring concern about certain health states from job choice are highly problematic, and we may need to turn to more specific behavioural indicators that are related to particular hazards, such as the frequency of optician visits.

Changes in well-being from a loss of vision at the outcome stage would be measured according to the extent to which it resulted in 'objective' (as opposed to self-reported) changes in health, or in objective losses in any of the other domains of life, such as income. Sen's arguments that ill health etc. should be valued according to its effect on people's ability to flourish rather than according to its effect on how they feel as such has been very influential in the context of the debate about how to value health losses (Dolan and Olsen, 2002). In many publicly funded health care systems, health interventions are evaluated, in one way or another, according to the extent to which they improve people's functionings and capabilities. Interpersonal comparisons of health gains are then made from the normative standpoint that a given health improvement is assigned the same value irrespective of the preferences or other characteristics of those involved (Dolan and Olsen, 2002).

At the experience stage, we would be interested in the extent to which people's physiological reactions or psychological affect are affected by vision loss. Resource and logistic constraints rule out the widespread measurement of brain activity, so the realistic alternative is the use of self-reports of immediate experience. However, people are not always willing and able to report on their well-being at every evaluation point, which leaves a number of question marks over the generalisability of the results from such approaches (see for example the time point response rates in Csikszentmihalyi and Hunter, 2003). In addition, ecological momentary assessments (Stone et al., 1999) seem better suited to measuring the well-being from various daily activities, rather than to measuring the general loss in well-being from

health state changes such as loss of vision which will be ‘in the background’ to some extent and will only come to the foreground when activities are compromised by the condition.

Finally, at the evaluation stage, people who had experienced significant vision loss would be asked to consider their health or life in general. There is a sense in which satisfaction questions are what we really mean when we think about how people feel – upon reflection – about their lives following vision loss. However, it may be that in an effort to maintain a degree of pride, or to avoid worrying family or friends, people may be reluctant to admit publicly that their well-being has fallen (Diener et al., 1999). And even if respondents are giving honest responses, these may be framed, as noted earlier, by the temporal, counterfactual and social comparisons they make. For example, someone who thinks that loss of vision would be awful for them but who finds it is not as bad as they had anticipated will be more satisfied than someone who underestimated its effects but who was no less affected, in some objective sense, by the loss than the other person. That satisfaction is so directly affected by expectation is a cause of concern in the public policy context.

### CONCLUDING REMARKS

There are many indicators of well-being currently in use, and it is not always easy to see how they relate to one another in any clear way. Our central proposal is that one way of structuring these indicators is to suggest that they tap into aspects of well-being at various stages in the well-being process. Our DWB model proposes six main stages in this process, from the anticipation stage through to the evaluation stage. Our unique experiences and how we interpret them feed directly into how we anticipate future events so the evaluation stage feeds directly into the anticipation stage.

Of course, the idea that well-being is a process is not new. Aristotle’s (350BC/1998) notion of ‘flourishing’, for example, makes explicit reference to the fact that well-being is not a static state, once achieved forever maintained (see also Maslow, 1954/1970). A process approach is also very much in keeping with Fromm (1976/2000) and

Allardt (1976) who stress that it is “being” and not “having” that is important for well-being. It is, perhaps, no coincidence that the term is ‘well-being’ rather than ‘well-having’. Moreover, the self-regulation literature in psychology has also stressed the importance of viewing motivations, goals, plans and behaviour in terms of their temporal relations and as an iterative process (Gollwitzer, 1990; Gollwitzer and Oettingen, 1998; Heckhausen, 1991).

What is original in our approach is its attempt to elucidate this process by showing how the various indicators of well-being that are currently being used relate to one another dynamically. At this stage, therefore, the DWB approach is primarily a descriptive model: a way of categorizing existing measures and understanding the relationships between them. Nevertheless, it seems to have numerous implications for theoretical and methodological development, policy-making and applied research more generally.

In terms of theoretical development, the model offers a framework for bringing together different theoretical approaches that have so far perhaps focused on the links between only a subset of the six stages. For example, the dynamic well-being approach suggests how theoretical work on the relationships between goals and behaviour (Gollwitzer, 1990) might be related, say, to work on comparison processes that have focused on experiences and evaluations (Olson et al., 2000). So, for example, for researchers interested in understanding apparently non-adaptive behaviours that are repeatedly engaged in (e.g. smoking) a consideration of where in the process potential ‘failures’ occur could be useful. For example, do people not give up smoking because at the anticipation stage they believe the negative outcomes are not that bad or at the planning stage where people attenuate perceptions of their own personal risk (i.e. optimistic bias)? Do they perhaps intend to give up but fail to do so at the behavioural stage, and is it perhaps the case that few short-term negative effects on health at the outcome stage encourage people to discount these possible outcomes? If smoking feels good at the experience stage, how might this feeling relate to, say, feelings of guilt arising from being aware that it is affecting your children’s health? Moreover, to what extent might such guilt affect the anticipated experiences of smoking the next cigarette? Clearly, there is a lot of work to do before the current descriptive model could be used to develop theoretical insights but we believe, at the very least, it could

provide a useful framework for testing perspectives that already exist at the various stages.

In terms of methodological development, the model also provides an aid for researchers interested in longitudinal research (e.g. Lucas et al., 2003) by highlighting the various time points they might want to consider and the pros and cons of each measure. For example, researchers interested in career satisfaction could begin by asking graduates about their anticipated satisfaction with a specific career (anticipation stage), and what goals they have related to actually attaining a job in this area (planning stage). The number of job applications they make, say, could be used as an indicator at the behavioural stage and whether they actually got offered a job in their chosen field would be an outcome stage measure. One could assess their feelings at being offered the job (the experience stage), and also how they subsequently feel about the job after some period of time (the evaluation stage). Measurements of their anticipated satisfaction associated with remaining in the job or changing to an alternative could then be taken (the anticipation stage) and so on through the process.

In terms of practical application, the discussion in section four suggests that the choice is between indicators based on self-reports at the anticipation, planning, experience or evaluation stage, and external assessments of well-being at the behaviour and outcome stages. Economists (such as those evaluating the effectiveness of health care interventions) have favoured the use of valuations elicited at the anticipation stage, but this view is increasingly being called into question because of the problems associated with affective forecasting (see Brazier et al., 2004). But this does not mean that we should automatically use valuations of well-being that have been elicited at the experience or evaluation stages, since some people or population sub-groups (like those with long-term limiting illness) may cope with and adapt to conditions in ways that public policy may legitimately wish to ignore. As Menzel et al. (2003) have noted: "it would certainly be ironic, or even perverse or unjust, if disabled persons lost competitive advantage in the race for scarce resources because their adaptation diminished the estimated value of curative and rehabilitative services for them" (p. 2155). In other words, relying on subjective reports of well-being may penalise the very people that public policy aims to support.

The question of which types of adaptation health policy should and should not take into account is certainly a vexing one that requires much more discussion. In essence, self-reports are for those situations where adaptation is appropriate and external assessments (at the outcome stage in the DWB process) are for when adaptation is considered inappropriate for policy. Of course, policy-makers might also wish to give some weight to both self-reports and external assessments, by appropriately adjusting the level of well-being as reported at the experience or evaluation stage by the 'objectively' achieved level of well-being at the outcome stage. It is not possible to discuss here what these weights might look like, or to go into detail about where such weights might be appropriate (although health state valuation might be one such area, where people's own assessments of their health could be weighted by external assessments of the severity of their condition), but we hope to have developed a framework within which further discussion can take place. As such our research is clearly endorsing Diener and Seligman's (2004) call for greater focus on policy in well-being research.

Finally, although we have primarily focused on individual well-being, we also believe the approach can be useful for comparisons across a range of different groups and countries. To date, much of this research relies on well-being at the evaluation stage (e.g. Inglehart and Klingeman, 2000). However, this is problematic if there are important cross-cultural differences in responses to questions of this type. Only by looking at well-being indicators across the various stages will we be able to get a more complete picture of, for example, cross-national levels of well-being. Moreover, even if there are real differences at the evaluation stage, taking measures of well-being at the other stages will aid explanation of any such differences. So, for example, it is well documented that feelings of relative deprivation and social protest are indicative of negative well-being, and frequently occur after a period of rapid economic and social change (see for example, Tyler and Smith, 1998). It has been suggested that this is caused by increased and unsustainable expectations and the measurement of well-being at the various stages as proposed by our model would help clarify these issues.

In conclusion, to ask which of the indicators should be used for policy purposes is to miss the point if they are inextricably linked and this is why we believe that the way forward is to understand more

about how they are linked to one another. This can only be achieved if we first of all identify clearly what type of indicator we are dealing with – and where it fits in the dynamic process of well-being.

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*Centre for Well-Being in Public Policy  
School of Health and Related Research  
University of Sheffield  
30 Regent Street  
Sheffield S1 4DA  
UK  
E-mail: P.Dolan@shef.ac.uk*

Paul Dolan

*Centre for Well-Being in Public Policy  
School of Health and Related Research  
University of Sheffield  
30 Regent Street  
Sheffield S1 4DA  
UK  
E-mail: m.p.white@shef.ac.uk*

Mathew White