Life Satisfaction and Affect: Why Do these SWB Measures Correlate Differently with Material Goods and Freedom?

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Abstract

Two different types of subjective well-being (SWB) measures exhibit a remarkable difference in their correlations with people's circumstances. The life satisfaction method shows relatively a strong correlation with income and material conveniences while affective measures are more tightly linked with freedom. Why is this so? To explain this difference I examine the cognitive mechanisms underlying these measures by means of dual process theory. This theory identifies two broad categories of cognition. One is Type 1: fast, intuitive, automatic and autonomous. The other is Type 2: slow, deliberate and under conscious control. (They are also known as System 1 and System 2). I argue that in our normal decision making there is a division of labor between these mechanisms. Type 2 is more focused on making choices, comparing material goods and tradeoffs between them, while Type 1 is more oriented at the freedom that is necessary to make those choices.

Keywords SWB · Well-being · Happiness · Measurements · Life satisfaction · Affect

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1 Introduction

Subjective well-being (SWB)[1] is a dynamic field populated with empirical scientists from various disciplines (psychology, economics, sociology) and with philosophers. There are two general reasons why philosophical work makes a worthwhile contribution to this field. Firstly, we all find well-being important but our intuitions are not very clear on what well-being exactly is. Most people have merely sketchy and probably also diverse ideas, which is therefore a reason for articulation and systematization of our common ideas. Secondly, SWB is a 'thick concept'. It has both descriptive meaning and normative meaning. Saying "P is doing well" can be describing something about P and at the same time appraising P. These dimensions can be conceptually distinguished but they come together in the form of mutual tests of adequacy. A normative notion of well-being must be rooted in what is descriptively possible for humans. And a descriptive notion of well-being needs to be normatively convincing. One must be able to explain why a certain understanding of SWB might also be good and important for people.

The central question of this paper is to examine with a philosophical eye a remarkable difference in empirical results between two methods of measuring SWB. One method is the life satisfaction method and asks directly how satisfied people are with their lives. The other method investigates this by means of their affects or emotions. It appears that the life satisfaction method is quite sensitive to people's material wealth and not very much to their perceived freedom or autonomy while this is the other way around for the affect method. The particular aim of the current paper is to examine these correlations: how to understand the difference between them, and how the mechanisms that produce these different correlations relate to each other.

Here is an overview of the general line of argumentation and the upcoming sections. In Sect. 2 I explain the two SWB measures and the difference in correlations. Section 3 examines the two mechanisms underlying these measures from a standpoint in cognitive psychology. This is dual process theory. The reason for this digression is that we are asking how two measurement techniques can yield a certain difference. I suggest that something about the underlying mechanisms is responsible for the difference. Section 4 puts the two cognitive mechanisms together in a concrete decision problem, illustrating how they each help in optimizing SWB by means of how they function. Section 5 concludes.

2 Methods of Measuring Subjective Well-Being

In this section, I will first explain the two methods and the different correlations in more detail. 'Life satisfaction' surveys typically ask as "how satisfied are you with your life, all things considered, on a scale from 0 to 10?" (this is 'Cantril's Ladder'). Or they ask this not for your whole life, all things considered, but for a given domain,

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[1] SWB is a measure of well-being as experienced by people themselves (as opposed to an objective concept) and self-reported by them through various kinds of questionnaires (as opposed to physiologically based measures).

like work. Another method consists in probing people's emotional responses. E.g. participants are asked to report how they are feeling while they are engaged in a broad variety of activities: so, for example, while vacuum cleaning, where on a 5-points scale between depressed and joyful, where between angry and friendly, and so on. So called 'global happiness' (or 'objective happiness') for this person is then construed as the average or temporal integral of the reported quality of a number of these momentary experiences. This is often called 'experience sampling'. A less labor-intensive method is asking people to report their emotions a day after, by ticking a 'yes' or 'no' when asked whether they have experienced enjoyment, smiling or laughter, sadness, anger, worry or depression. From this an 'Affect Balance scale' is produced by using a 1 for a 'yes' and a 0 for a 'no', and then subtracting the negative emotions average from the positive emotions average.[2] In this paper, we will mainly discuss the life satisfaction method (the Ladder) and the (day after) Affect Balance scale.

There is a broad consensus among the SWB researchers that the various methods of measurement in happiness (or subjective well-being) research can be distinguished as either mostly on the "judgmental" or "cognitive" side or else mostly on the "affective" side. It is agreed that the various measures are either mostly "saturated with cognition or with affect" (Diener et al. 2010 p. 3). The difference is that typical life satisfaction survey asks a participant to judge their life, take up a standpoint towards it, in terms of the SWB method itself (e.g. "how satisfied are you with your life?"), whereas affect methods *construct* an index of SWB out of self-reported emotional states that occurred somewhere *during* one's daily life (e.g. yesterday). This does not mean that these SWB researchers think of emotions as non-cognitive states, which cannot be true or false. In this sense, the distinction cognition - affect is perhaps misleading from a philosophical point of view. As we will see in Sect. 3, the SWB researchers build on a theory of emotions that is cognitive, but in a special way.

As already indicated in the introduction, this paper discusses one remarkable finding from the last decade of SWB empirical research. It has been replicated in several studies and it is often cited and mentioned in the literature. It has also been noticed by philosophers.[3] But as far as I can see, a proper explanation of this result is still lacking.

The finding, based on measurements in various countries all over the world is that the life satisfaction method shows relatively strong correlations with income and material conveniences (like a telephone, a computer, and a television) and that affective measures are more tightly linked with how people perceive their own freedom (operationalized by a question of whether they can choose how to spend their time). To give an indication of the differences, in the often cited study of Diener et al. (2010), regression analysis shows that freedom in terms of how one spends one's time had a 0.30 correlation with the life satisfaction method and a 0.56 correlation with (day after) Affect Balance; while the possession of income and material goods respectively had 0.83 and 0.78 correlations with the life satisfaction method, and 0.31

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[2] I sidestep the issue of whether it is meaningful to aggregate scores of positive and negative emotions. I assume it is possible. For a criticism see Wodak (2019); de Boer (2014).

[3] Philosophers Anna Alexandra and Daniel Haybron, see below.

and 0.14 correlations with (day after) Affect Balance.[4] These are substantial differences. In the words of empirical SWB researchers Diener et al. (2010, p. 9):

> The pattern of correlations clearly indicates that income and conveniences are more strongly associated with well-being judgements, and that feelings tend to be more strongly associated with the perceived freedom to choose how to spend one's time.

Another pioneering SWB researcher, Inglehart (2010, p. 357), demonstrates that for Russian people after the dissolution of the Soviet Union the cognitive measure life satisfaction tracks falling income while an affective measure correlates with the rise of democracy.

> During the period analyzed here, many ex-communist countries experienced democratization that was accompanied by economic collapse – with the result that personal happiness [an affect response, in Inglehart's analysis] rose, while life satisfaction fell.

In a recent review article Diener et al. (2018) again note that positive emotions are more strongly associated with the ability to choose how to spend one's time than with wealth. These authors use 'wealth' as a summary term for material goods (like a telephone, a computer, and a television) and income. In this paper, I will just say 'material goods'. In the World Happiness Reports (which draws on the Gallup World Poll, the most comprehensive opinion survey of the world), these findings have gotten replicated year after year. Using data from 2005 to 2022, the latest 2023 report (Helliwell et al. 2023, pp. 37–38) notes that per capita income has a significant effect on life satisfaction, while the factor freedom has a strong effect on positive and negative emotions.[5]

This of course doesn't mean that freedom does not impact life satisfaction at all, nor that income does not affect people's emotional lives. Numerous studies show this, but the fact remains of this remarkable and widely found difference in impact, which calls for an explanation.

On exactly this difference, philosopher Anna Alexandrova writes in her book *A Philosophy for the Science of Well-Being* (2017, pp. 133–134):

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[4] This life satisfaction method in this study is the 'Cantril ladder'. There are subtle differences with other life satisfaction methods but these need not concern us. The ladder is a variant of the life satisfaction method.

[5] The reports from 2012 until now can be found at https://worldhappiness.report/archive/ Unfortunately, since 2012 the Gallup polls no longer include the measurement of material conveniences as a component of material prosperity, only income. But there are enough other studies that bolster the results above. E.g. Noll and Weick (2015) and Brown and Gathergood (2020) demonstrate that material conveniences have an even larger effect on life satisfaction than income has. Tsurumi et al. (2021) replicate the finding that material consumption has a much stronger effect on life satisfaction than on Affect Balance.

> [T]his is precisely the shape of the conflict between metrics of life evaluation (…) and affect measures. (…) Which correlation is more significant? (…) These questions cannot be resolved by checking more correlations.

On a very similar point philosopher Daniel Haybron writes in the *Stanford Encyclopedia of Philosophy*, lemma Happiness (Haybron 2020):

> Here, again, philosophical views about the nature and significance of happiness may play an important role in understanding empirical results and their practical upshot.

Because there is no evidence that this result is generated on a mere population level, for example by an uneven demographic spread of personality types, I propose to investigate this issue in general terms, as saying something about how human creatures respond to the circumstances of their lives.[6] More specifically, I take it that a relatively strong correlation between Affect Balance and freedom means that emotionally, people are somehow more sensitive to circumstances of freedom, and a strong correlation between life satisfaction and material goods means that evaluatively, people are somehow more sensitive to material goods. From this follows the central question of this paper:

> Affect measures more closely track freedom while life satisfaction measures more closely track material goods. How to understand this and what might follow from this for these measures?

Both measures clearly have some initial normative plausibility. When we meet a friend we ask: "How is life?" or "How do you feel?" At the same time, both approaches also provide standpoints from which the other can be criticized, because a person can be satisfied with her life but feel depressed, and someone may feel good while not being satisfied with his life. Daniel Hausman criticizes both measures. About the (day after) Affect Balance measure, for example, he notices that the SWB researchers do not explain what makes the various affects that go into this measure important. Nor do they make clear why affects are important at all: "It is as if our guts step in where our heads fear to tread" (Hausman 2015, p. 129).

Daniel Kahneman, who pioneered the affect measures and criticized the life satisfaction method early on, has now changed his mind on this and finds that both measures are valid: "Life satisfaction is not a flawed method of experienced well-being. (…) We must accept the complexities of a hybrid view" (Kahneman 2011, pp. 397, 402). But he and his empirical colleagues have been silent so far on how to think of such a complex hybrid view.

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[6] This is not always the case: some variables are dependent on gender, personality traits, sociological facts and so on. In the ideal case, the analysis should control for this. Here I assume in principle that there is no such confounding and that what shows among large groups of people in varying degrees tells us something about their psychology in general.

This can perhaps be explained by what Alexandrova has called "theory avoidance" on the part of these scholars. The empirical SWB researchers invest a lot in ways to validate their measurement constructs by means of expert panels drawn from the target population and statistical techniques like factor analysis but they underplay the role of philosophical and normative validation, she argues (Alexandrova 2017, pp. 146, 147; see also her 2008, pp. 580, 81).

> Psychometricians feel averse to acting like philosophers, that is, to theorizing about the nature of well-being in a way that breaks away from the data collected by questionnaires. (…) [T]his avoidance of philosophy and its replacement with a technical exercise in construct validation is epistemically wrong and morally dangerous.

And a bit further on she continues (ibid., p. 151):

> It is now commonplace to require that philosophers relying on empirical assumptions must engage with the relevant scientific literatures. Scientists engaged in validation of well-being measures — one of the most philosophical of scientific tasks — also should acquaint themselves with the relevant philosophical work.

So let us now turn to the question of how the two methods in SWB research can be understood by bringing in more theory and philosophy.

3 Causal Mechanisms and Function: Dual Process Theory

In this section, I propose to analyze the relation between the affect method and the life satisfaction method by means of *dual process theory* and by a certain account of emotions as a part of this theory. The core idea is that the two SWB methods rely on distinct cognitive processes and that there is a division of labor between the two kinds of processes. The next Sect. (4) puts these two cognitive processes accompanied by material goods and freedom at work in a decision problem.

Dual process theory holds that there are two different kinds of thinking. One is Type 1: fast, intuitive, automatic and autonomous. The other is Type 2: slow, deliberate and under conscious control. For example, the flight or fight response is Type 1, and multiplying 15 by 17 is Type 2. The general idea is not new and has already been voiced in ancient times. In book IV of the Republic Socrates asks Glaucon: "And might a man be thirsty, and yet unwilling to drink?" "Yes, Glaucon answers, "it happens constantly." Socrates continues: "And in such a case what is one to say? Would you not say that there was something in the soul bidding a man to drink, and something else forbidding him, which is other and stronger than the principle which bids him?"

Various modern versions of this theory have been developed in the last fifty years. A recent state of the art article is written by Evans and Stanovich (2013), two founding figures of the current field. Daniel Kahneman popularized this theory in his bestselling *Thinking, Fast and Slow* (2011). In this book, Kahneman refers to these types as System

1 and System 2, which were the older terms. I will follow Evans and Stanovich's terms Type 1 and 2, because this is now the current practice in the field.

Besides the features of speed, autonomy and control mentioned already, what is also often found is that Type 1 processes typically stem from older brain parts that humans largely share with other creatures. Type 2 processes, on the other hand, are commonly produced by brain areas, which have evolved more recently.[7]

This two-tier cognitive structure is called *default-interventionist*. "Type 1 processing generates intuitive default responses on which subsequent reflective Type 2 processing may or may not intervene," Evans and Stanovich say (2013, p. 227). Or, as Kahneman puts it, Type 2 kicks in when Type 1 runs into difficulty (2011, p. 24). Since we will talk in this paper of T1 processes as emotional processes and T2 as deliberate, let's designate the two as $T1_E$ and $T2_D$ respectively.

Human emotions like anger, fear, joy, surprise and sadness are paradigm examples of Type 1 processes because they fairly robustly exhibit all the features: speed, autonomy or mandatoriness and neurological specialization. These features are causally related. Our basic emotional responses are fast and mandatory exactly *because* they are largely neurologically separate.

In the literature on emotions, what I just called Type 1 emotions are known as 'basic emotions'. That there are basic emotions with the just described properties (and more) is however not uncontested. 'Psychological constructionists' criticize this theory and claim that emotions are foremost the result of general cognitive capacities and the emotion concepts that are present in a person's language, and which differ between cultures.[8] This paper builds on a recent version of basic emotion theory. But as there is this current controversy among emotion researchers on this issue, I will use the remainder of this section to further present and discuss the concept of 'basic emotions'.

According to the basic emotion theory, there is a group of emotions like anger, sadness, fear, surprise, and joy that are biologically innate and universal across cultures. Darwin already argued that emotions are adaptations, that they have evolved to motivate us in settings that are important for our survival. The objects of emotions have to do with our concerns, things that are typically important to us.[9] One is angry because one is hurt, joyful because of some achievement, and scared because there is danger. Paul Ekman, who pioneered much of the modern emotion studies, argued that emotions "evolved for their adaptive value in dealing with *fundamental life tasks*" (Ekman 1999, p. 46).[10]

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[7] Evans and Stanovich now see emotions as typical of T1 but no longer as defining it. In this paper we can sidestep this discussion in the literature because our focus is on emotions and because I adopt a looser conceptual taxonomy, not one based on defining characteristics but more in the direction of family resemblance characteristics. See the last two paragraphs of this section.

[8] Barrett (2011, 2017).

[9] Frijda (1986).

[10] More recently, Gen Eickers, Juan Loaiza and Jesse Prinz say that they "think that emotions can be classified according to their motivational role taken in conjunction with their embodiment. Emotions are embodied responses that respond to situations that bear on the well-being of an organism, such as threats, losses, achievements, transgressions, and so on" (2017, p. 34).

Emotions motivate us, they have typical *action tendencies*. Fear makes us scream and run; when we are angry we are ready to shout and fight; and when we are happy we sing and dance. Thus an important quality of the behavioral aspect of emotions is that they *make* us do things. The action tendencies of emotional states are in large measure involuntary. We obey our emotions. I know that it is only a film but I cannot help to be thrilled. What is more, I may have seen a certain action movie already twice, and still be thrilled when seeing the hero running and stumbling through the woods, trying to escape from those special agents with rifles, dogs and helicopters. In this respect emotions are stupid; they effectuate a whole or partial closure of higher order cognitive processing. They override thought. A related aspect is that emotions are quick. As they are often automatic, not in need of or disturbed by deliberate attention or thinking, they can do their jobs quickly.

Besides action tendencies, basic emotions also embody characteristic bodily expressions. When we are joyful we have a smiling face. The lips are curled up and we show small wrinkles in the outer corners of the eyes. The gaze is soft and the voice is excited. An angry person has a sharp gaze, the eyebrows are down in the middle, and the voice is loud. A sad person has a droopy mouth. They tell the others to stay away, or to come closer and perhaps share in the fun, or they may ask for assistance. Basic emotions thus serve to communicate a certain message.

Early studies that demonstrated the universality of facial expressions however failed to replicate in larger samples. This indeed appeared to result from the fact that participants in these studies came from various backgrounds and used different concepts for emotions. But a recent study by Cowen et al. (2020) side stepped this problem of language and culture possibly confounding the results by training an AI system to recognize facial expressions. Six million videos of events like weddings, fireworks and sports competitions from regions across the world showed strong correlations between facial expression and social context across 12 regions around the world (encompassing 144 countries).

Another issue is that the linkages between emotion category, behavior, facial expression, and neurology are less tight than previously thought. There are often exceptions. For example, a person can sit behind her desk, remember something that happened a week ago and then become angry without the typical facial expression and also without taking action. Or, one does not experience joy while still having a joyful expression on one's face, out of courtesy perhaps. More generally, raw emotion information-streams can of course always deliver *input* into the higher cortical regions, and thus become ingredients for planning, problem solving and reflection. When I sit down in my house and imagine whether I should run from a lion or not, I will probably reach the same conclusion as my fear response. But now the feeling of fear is much weaker and augmented with other ideas and emotions. Then my mental state becomes a mixture of affect and deliberation.[11]

Notwithstanding these complications, it is still the case that speed, mandatoriness and specialized neurology strongly interrelate in their occurrences, and this is because of the causal relations among them. Philosophers Andrea Scarantino and

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[11] Emotion scholar Robert Levenson: "basic emotions may well serve as building blocks for other more complex emotions and for more emotion-related states." (Levenson 2011, p. 382).

Paul Griffiths helpfully contributed to the theory of basic emotions by steering the discussion away from rigid lists with necessary and sufficient features — as if emotions have clear cut essences (and are natural kinds on the model of the chemical elements) (Scarantino and Griffiths 2011; Scarantino 2012).[12] In the social and biological sciences, concepts do not carve out natural kinds in the same way as in physics and chemistry. Laws are hardly ever exact: patterns and generalizations are most of the time merely local and even then accompanied by counter instances.

Therefore Scarantino and Griffiths represent emotion features as making up a *homeostatic property cluster*, a concept that they borrow from Richard Boyd (and which is similar to Wittgenstein's idea of family resemblance): "the natural definition of […] homeostatic property clusters kinds is determined by the members of a cluster of often co-occurring properties and by the ('homeostatic') mechanisms that bring about their co-occurrence (Boyd 1999, p. 141)."

As I write, the debate on basic emotions is not settled. A more elaborate discussion is however beyond the scope of this paper. With the present version of the basic emotion theory I hope I have made sufficiently plausible that emotions are in large part different in nature than the higher cognitive processes like planning, weighing options and complex problem solving.

4 Application: A Normative Decision Problem

So I propose that we assume that there is this causal and functional division of labor between $T1_E$ and $T2_D$ cognition. Let's now put the various elements — the two cognitive mechanisms, material goods and freedom — together at work by means of a concrete decision problem. I set up this problem as a normative decision theoretic problem about material goods, with a place for freedom, and so that both $T1_E$ and $T2_D$ mechanisms play a functional, i.e. SWB optimizing role.

In normative decision theory, the assumption is that individuals, the decision makers, are rational. They evaluate matters in terms of their pay offs (utilities), i.e. in terms of how good these matters are in all relevant respects and by their own lights. Pay offs or utilities are therefore also a kind of SWB indicator. But pay offs are not the only relevant consideration. Another is how probable it is that something will be attained, that a line of action is going to be successful in realizing a specific payoff. Individuals therefore also consider the various ways in which they think that the world may unfold: the possible scenarios (or states of the world), and their respective probabilities. And then given a set of possible actions, states of the world, subjective probabilities, and pay offs, normative decision theory assumes that an individual will try to optimize by using a rational decision rule, like maximizing expected pay offs or maximin.[13]

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[12] See also Loaiza (2021) which urges emotion researchers to be more precise about the exact individuation of these features.

[13] Maximizing expected pay offs means calculating expected pay off per possible line action, that is weighing pay offs with probabilities per action, and then choosing the action with the highest expected pay off. Maximin means comparing actions by their lowest possible pay off and then choosing the highest among these. A good introduction into normative decision theory is Peterson (2017).

The aim of the exercise in this section is to examine through a decision problem how it could be, as the SWB studies had shown, that $T1_E$ is more strongly related to freedom and $T2_D$ to material goods. Why by means a decision problem? This is because in such a problem we can see the cognitive mechanisms at work. We *have* $T1_E$ and $T2_D$ because we are creatures who act and make choices.

Here is a decision problem, with states of the world, strategies and pay offs. Suppose that a group of people live on an island and that their possibilities of attaining food consist of hunting, fishing and collecting fruit. These possibilities are dependent on the weather. Fishing requires dry weather and wind, otherwise the islanders cannot sail off to their fishing grounds. Hunting requires dry weather, otherwise the forest animals stay in their unreachable holes and nests. Collecting fruit, however, is always an option. It is not dependent on the weather conditions. The islanders live at a juncture in the woods. The sea is two miles to the south, the fruit trees two miles to the east, the hunting grounds two miles to the west.

	wind, dry	wind, rain	windless, dry	windless, rain
Hunting	2	0	2	0
Fishing	3	0	0	0
Fruit collecting	1	1	1	1

More complicated challenges can be imagined, e.g. predators, conspecifics to keep an eye on, for better or worse (teamwork may bring extra fruit to one's labors but also betrayal), but this simple matrix already suffices for my purposes. The idea is that beyond a certain point decisional complexity can no longer be dealt with by a range of genetically encoded impulses or action programs ('when X happens, do A'). Assume this is the case with the three possible lines of action and the four weather conditions of our imaginative hunter-gatherers. Pay off depends on the circumstances: it is best to go fishing when there is wind and no rain; when there is rain it is best to collect fruit; and one should go hunting when it is windless and dry.

Each morning, one takes a good look around: is the sun shining, are there any clouds, how strong is the wind? One tries to make a forecast of the upcoming weather condition for that day, and if possible one ascribes a mixture of probabilities to the four states. Then one can determine expected utilities.[14] Alternatively, one can settle on maximin if one has no idea about the probabilities or there is some reason to avoid risk. Humans have developed higher cognitive powers to decide the best course of action under such varying circumstances. They must be able to select an adequate decision rule, to keep the several possible results of their action plans in mind, what the available goods – game, fish and fruits – are worth, and how this worth depends on the contingent state of affairs (the weather).

I assume that this overseeing and consequent assessing of the possibilities and opportunities in order to reach a decision already contain a good degree of complexity (as said, more variables could be added: e.g. a need for nutritional variety, predators, other people). So this is one thing to do for a decision maker: ascribing probabilities and weighing the goods or outcomes given a range of possible actions and states of the world.

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[14] Assuming that the pay offs in the matrix are cardinal numbers.

How do emotions play a part in this? There are two ways. Firstly, there can be emotional valence upon achieving or not achieving some goal. Catching a fish, for example, makes one happy and failing to do so sad. This is, in a sense, already reflected by the pay offs. Catching a big fish makes one joyful: it has high utility indeed. To the extent that this happens, $T2_D$ and $T1_E$ will converge somewhat in their evaluations: achieving a goal like catching a fish brings (domain) satisfaction and possibly joy. But it is important to see that in this case $T1_E$ does not trigger the relevant action tendency. Exactly because of the complexity of the problem, it is $T2_D$ that is doing the decision making and thus selecting the action.

The second, and more urgent, role that emotions play in this context is keeping one's set of strategies open – not letting someone or something limit what you can do. After all, given that these weather conditions are all probable, it would be bad if one's possible lines of action were somehow curtailed. Something or someone blocking your plans or bossing you around will reduce the whole decision matrix at once. Such threats require a fast and strong response. Push the other aside, protest in an angry voice, call for help, or slam a door. A broadening of one's set of relevant lines of action, on the other hand, increases one's freedom. Getting a boat to explore the waters, being asked to join the group of hunters, the boss gone, are new doors opening: reasons for joy.[15]

Hence in this decision making context the function of the system of emotions is mainly safeguarding one's set of alternative actions, one's freedom.[16] As discussed in the previous section, emotions have evolved to make us deal with fundamental life tasks. Now if there is one obvious fundamental task for a creature that moves around and makes decisions, it is to protect its freedom. The capacity to make one's own decisions, one's freedom or autonomy,[17] (which is a priori for decision theory) is a basic psychological need according to the influential 'self-determination theory' as developed by Edward Deci and Richard Ryan (Ryan and Deci 2000; Deci and Ryan 2000). This theory says that there are three basic psychological needs that are essential for psychological growth, integrity and well-being: relatedness, competence and autonomy. Just like plants that need water, human beings only fare well when these needs are satisfied. People who are less autonomous, for example, because they are dependent or bossed around, drop out earlier in educational programs, and get lower grades. Less autonomous patients are less able to adhere to medication or maintain

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[15] One could argue that a larger set of *items* can also increase one's freedom, not just actions. This is true but items do this only as they are *choice* items: things to choose from. I assume that an enlargement of a set of items that merely befall a person, without further consequences for the possible actions that one can undertake, do not by themselves increase one's freedom. A richer environment may be good for a person without necessarily making her more free.

[16] Choosing a response to a threat is in a sense a different decision problem (nested within with the hunt/fish/fruit problem). It could for example be a hawk-dove game if the threat comes from another person. Then the options are fiercely attack (hawk) and retreat or lay low (dove). The point is that such situation often calls for quick action while being sufficiently simple: one's emotional machinery can deal with it.

[17] In the SWB literature that is discussed in this paper, and as mentioned on p. 3, 'freedom' is understood as the ability how to spend one's time. For this reason I treat it as largely synonymous with 'autonomy' – the capacity of self-governance.

a certain healthy regime. Autonomous people are better attuned to environmental affordances and internal capacities (Deci and Ryan 2000, p. 254).[18]

In the philosophy of well-being literature Haybron (2008, 2013, 2020) also argues for this basic relation between well-being, emotion and being free. Haybron understands SWB as "psychic affirmation of one's life", by which he means a positive emotional response of the self to one's life. He distinguishes three stages of psychic flourishing: attunement, engagement and endorsement. Particularly relevant is his idea that being safe and secure in one's situation, not threatened or coerced, is basic in a sense. It is basic in the sense that it is the least sophisticated kind of psychic flourishing but also because it comes prior. Haybron says: "The prominence of attunement reflects what we may think of as the stages of flourishing for a creature: the first priority is to establish conditions of safety and security, where the basic needs for functioning are firmly established so that it can make itself at home and blossom — like placing a sapling in fertile soil" (Haybron 2008, p. 121). Being attuned at this level is feeling happy in a relaxed and tranquil way. The opposite is being anxious or stressed. Being free is being safe and secure, not threatened or bossed around. Being free is being able to explore and choose from different lines of action, like attaining goods and making a living.[19]

Hence an important job for human emotional machinery is arguably to protect one's autonomy, the capacity to make decisions. The other problem of weighing, comparing and decision-making itself makes up a job of another kind. This is documented by brain research. Kable and Glimcher in their important (2009) article "The Neurobiology of Decision: Consensus and Controversy" report that there is consensus in neuroscience that decision making involves two stages that largely recruit different brain areas. The stage of subjective valuation appears to recruit the ventromedial sector and amygdala,[20] while the second stage of comparing and selecting among several options with some complexity recruits the higher cortical areas of the brain (like the lateral and medial prefrontal cortex and the parietal areas). Neuroscientists ask people to lie down in an fMRi scanner, confront them with items and then look at what brain parts lit up. In for example hungry participants, being faced with various snacks, activity in the ventromedial sector is proportional to the self-reported worth of these snacks. The emotional parts of the brain are scarcely involved when people are asked to make more complicated decisions, like choosing between a lottery with known probabilities, one with unknown probabilities, and a certain outcome.[21] That the choice act itself recruits different brain areas is also demonstrated by studies that

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[18] A recent summary statement of their theory is Ryan and Deci (2022). See also the further development of 'basic psychological needs theory' as a mini theory of self-determination theory, e.g. Vansteenkiste et al. (2020).

[19] Two other recent philosophical accounts of SWB that partially build on Haybron (2008) are Tiberius (2018, pp. 63, 64) and (already mentioned) Alexandrova (2017, pp.132–133).

[20] See Damasio et al. (1991), Glimcher and Rustichini (2004, p. 451).

[21] Rustichini et al. (2005).

compare free choice (like choosing between colored figures) with specified choice (like choosing the figure that matches a cue).[22]

So there is a division of labor in our brains regarding material goods and freedom in decision making. Reflective and cortical cognition $T2_D$ monitors and compares the available material goods whereas the older emotional machinery $T1_E$ monitors freedom (keep the set of available lines of action large). But there are not *just* two jobs to be done, different in function and location. They are also related. The relation is that higher cognitive processing concentrates on the outcomes in a complex decision problem while emotional responding concentrates on the conditions of possibility of these outcomes within one's control, one's strategies.

Now on the DPT model it is conceivable that people act emotionally also in response to a fluctuation in material goods, not just when their freedom is at stake. So why don't we see this in the SWB data from, for example, the Diener et al. (2010) study? Why is there such a low correlation between affect and material goods? Here are two answers.

Firstly, the $T1_E$ and $T2_D$ theory under development would advocate that this has to do with the character of the material goods involved. Remember from Sect. 2 that the measurements involved material conveniences (like a telephone, a computer and a television). On the view that emotions function to serve important concerns, that emotions have evolved to deal with fundamental life tasks, it seems to be the case that the material goods figuring in the SWB data were not of very fundamental importance for most participants in this study. Another study, by Kahneman and Deaton (2010) reports that affect reaches a satiation point when income rises, whereas life satisfaction does not. It is especially in the lower income groups that having more money reduces experiences of stress, worry and sadness. I suggest that the material goods involved in the Diener et al. (2010) study are on par with middle and higher income, viz. beyond the level at which the lack or the presence of these goods brings worry and sadness or cheer and joy.

Secondly, this low correlation between material goods and affect could be an effect of the typical daily practices that the participants of these studies find themselves in. The subjects of the SWB studies are of course normally engaged in their daily activities and decision making and it seems plausible that the general nature of this practice will influence their SWB scores. At the beginning of this section, I have proposed a decision context in which material goods are objects of relatively calmly assessing and weighing. But less calm contexts can also be imagined, of course. In a civil war, for example, people can be less sure of their possessions. Hence, it seems probable that in a context in which plundering and theft are common not only freedom tightly links with affect but also material goods. Likewise, it is logically possible to have a context in which grades of freedom are the enduring objects of careful estimating, weighing and coupling with probabilities by decision makers.

If something like this is true, then it is not just dual process theory and $T1_E$ and $T2_D$ that help to explain the difference in SWB correlations but also the local contexts in which these cognitive mechanisms normally operate. The empirical studies done by the SWB researchers are broad and cross cultural, and I have tried to explain some patterns in the data on the basis of a moderately peaceful decision setting. Such decision setting is fairly

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[22] For this, see the meta-analysis by Si et al. (2021). A good recent review of the neuro literature on decision making is Serra (2021).

normal for many people in many different countries. But it is not necessary or universal. There can also be people living under circumstances that will produce quite different SWB correlations, given $T1_E$ and $T2_D$.

5 Conclusion

The affect method and life satisfaction method correlate differently because underlying are two different cognitive mechanisms, $T1_E$ and $T2_D$. There is a functional and causal division of labor between these mechanisms. $T2_D$ deliberate cognition monitors the availability and worth of material goods, and how to get them. $T1_E$ subcortical emotions more closely track and protect freedom, the possibility to undertake various lines of action. But all this is also dependent on the local context, the specific environment that participants of surveys find themselves in.

Declarations

Conflict of Interest None

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