The Self-Beneficial System of Trade: A Systematic Framework Describing Human Motivation

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Author Note

The research was done independently. It should be noted that the researcher was an undergraduate student of Trevecca Nazarene University during the development of the SBST. However, Trevecca Nazarene University did not sanction or fund the research.

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Abstract

This paper will explore and explain the Self-Beneficial System of Trade, also known as the SBST. The Self-Beneficial System of Trade is an original systematic framework whose purpose is to describe human motivation. The implications of the SBST are clear descriptions of the strategies used to motivate people into selecting a specific option. This paper will focus on techniques practiced by companies to persuade customers into purchasing their goods and services. These strategies are derived by manipulating the mathematical relationships of the elements within the proposed system, which then have real-world implications for marketers, managers, psychologists, sociologists, and many other situations where human motivation plays a role.

Keywords: motivation theory, social exchange theory, microeconomics, marketing, utility theory, and consumer behavior

Introduction

The Self-Beneficial System of Trade (hereafter referred to as the SBST) is an original systematic framework developed by Christopher Morel. Its purpose is to describe human motivation. The SBST aims to achieve this by identifying the elements in the decision-making process and describing their relationships to one another mathematically. Through these relationships we may infer strategies used to motivate a person to make a particular decision.

So, in this paper, we will begin by explaining the elements of the SBST and comparing these explanations to a hypothetical example of a person going through the decision-making process. By utilizing both methods, in the description of the SBST, a more holistic *Understanding* should be established through the recognition of how each element works with one another, rather than only expressing them as disparate parts.

The next section will describe the persuasion strategies that have been identified by the SBST, these will mainly be compared to marketing and debating strategies. Both marketing and debating involve the persuasion of a person to take specific actions, so through the alignment of strategies found in the SBST and strategies used by people in these fields it should prove as corroborating evidence for the claims made by the SBST.

Then, possible applications of the SBST will be discussed, as the SBST (even in its preliminary state) can be applied to many scenarios in real-life by academics and non-academics alike.

Finally, this paper will describe the limitations of the SBST and provide avenues of further research for those who are capable and willing.

Definitions

Option Comparison Table Definitions

- I. **Astounded:** When the *Subject's Perception* of the *Option* upon receipt of its *Benefits* is greater than the *Subject's Perceived Option Benefit* at the point of selection
- II. **Attitude:** The feelings a person has towards a *Consideration*
- III. **Cheated:** When the *Subject's Perception* of the *Option* upon receipt of its *Benefits* is lower than the *Subject's Perceived Option Benefit* at the point of selection
- IV. **Consideration Title:** A phrase describing the *Benefits* indicated by the *Consideration*
- V. **Considerations:** The division of all the *Subject's Perceived Beneficial* effects for selecting an *Option* into individual, legibly specific *Beneficial* effects. Each *Consideration* is *Evoked* and has a value ascribed to it in the form of the *Subject's Attitude* towards it. *Considerations* include both *Meta-Considerations* and *Primary Considerations*.
- VI. **Evoke:** To create by an unknown means
- VII. **Evoked Set of Meta-Considerations:** The *Meta-Considerations* used in evaluating a *Primary Consideration's Attitude*
- VIII. **Evoked Set of Primary Considerations:** The *Primary Considerations* used in evaluating an *Option*
- IX. **General Impressions:** The final *Meta-Consideration* which is always at the end of each line of *Meta-Considerations*. This is the point where the rationalization of “why” a person feels a certain way falls apart, and the person “just feels that way” towards a *Consideration*.
- X. **Meta-Considerations:** The reasonings behind a *Primary Consideration*. They describe why we feel a certain way towards a *Primary Consideration*. These are *Evoked*.
- XI. **Option:** A distinct potential *Trade*
- XII. **Option Comparison Table:** the pictorial representation of the SBST where *Options* are compared against one another
- XIII. **Option Focus:** the direct awareness of an *Option*
- XIV. **Option Title:** A description of the potential *Trade*
- XV. **Perceive:** to regard as being such, from a person's *Subjective* comprehension
- XVI. **Perceived Option Benefit:** The *Total Option Attitude* multiplied by *Option Focus*
- XVII. **Primary Considerations:** The main reasons used in assessing an *Option*. These are *Evoked*.
- XVIII. **Self-Beneficial:** The idea that people work towards their greatest *Benefit*.
- XIX. **Subject:** The individual person whose decision-making process is being analyzed by the SBST
- XX. **Total Option Attitude:** The sum of an *Option's Primary Considerations' Attitudes*
- XXI. **Trade:** A change of state. This state may be financial, physical, emotional, relating to a person's desires, relating to a person's *Understanding*, relating to a person's *Opinions*, etc.

Three Benefits Definitions

General Definitions

- XXII. **Ambiguity:** *Perceived* lack of *Opinions/Understanding* towards the *Benefits* of a *Consideration*. If there is either a *Perceived* lack of *Understanding* or a *Perceived* lack of *Opinions*, or both, then there is a *Perceived* lack of *Opinions/Understanding*.
- XXIII. **Benefit:** A *Perceived* gain, which may be positive, value-less, or negative
- XXIV. **Cost:** a negative *Benefit*
- XXV. **Innate Aspects:** These are the fluctuating inclinations of a person caused by their internal factors, such as a person's mental capabilities and their dispositions
- XXVI. **Modifier:** A value which is used to modify a previous value
- XXVII. **Opinions/Understanding:** What a person *Understands* about a *Consideration* and how they feel about what they *Understand*
- XXVIII. **Opinion:** How a person feels about what they *Understand*, especially in reference to any emotional or moral associations that the person has towards what they *Understand*.
- XXIX. **Reward:** A positive *Benefit*
- XXX. **Three Benefits:** a substitute for *General Impressions* based on Social Exchange Theory that is comprised of *Immediate Benefits*, *Forecasted Benefits*, and *Cumulative Benefits*.
- XXXI. **Trade History:** This is a descriptor of past *Trades*, predominantly describing the recency and frequency of a *Consideration's* involvement in *Trades* and whether those *Trades* were a success (it was in an *Option* that was selected) or whether they were a failure (it was in an *Option* with a high *Option Focus* that was not selected).
- XXXII. **Understand:** What a person believes about something, especially in reference to its potential consequences and its properties.

Immediate Benefits Definitions

- XXXIII. **Immediate:** relating to the short-term
- XXXIV. **Immediate Benefits:** *Benefits* received in a short time period from the present
- XXXV. **Impulsiveness:** A person's inclination to be swayed by short-term gains and losses.
- XXXVI. **Perceived Immediate Value:** *Immediate Rewards* minus the *Immediate Ambiguity* minus the *Immediate Costs*

Forecasted Benefits Definitions

- XXXVII. **Forecasted:** relating to the future
- XXXVIII. **Forecasted Benefits:** *Benefits* received in the future
- XXXIX. **Perceived Forecasted Value:** *Forecasted Rewards* minus the *Forecasted Ambiguity* minus the *Forecasted Costs*
- XL. **Prudence:** A person's inclination to plan for the future; be swayed by future gains and losses.

Cumulative Benefits Definitions

- XLI. **Cumulative:** relating to an accumulation from the past
- XLII. **Cumulative Benefits:** *Benefits* accumulated from the past
- XLIII. **Perceived Cumulative Value:** *Cumulative Rewards* minus the *Cumulative Ambiguity* minus the *Cumulative Costs*
- XLIV. **Sentimentality:** The inclination of a person to place value onto the past; to be swayed by past gains and losses

Research

The research done to develop the SBST involved the accumulation of knowledge from across the internet and life-experiences, where it was synthesized through conceptualization and enhanced with inspiration. The only use of information that was directly applied to the SBST was Social Exchange Theory, in the creation of the *Three Benefits*. It should be acknowledged that Utility Theory does have a resemblance to the SBST. However, this was not used in its development. Any resemblance to Utility Theory or any other ideas, besides Social Exchange Theory, should be treated as convergent evolution of thought.

The manner in which the effectiveness and accuracy of the SBST were measured was through the search of conflicting and corroborating sources of evidence.

It was assumed that the SBST would have diverging views on motivation, as compared to the status quo of motivation theories, this was not the case as many ideas found in modern motivation theories can be found in or applied to the SBST.

In search of corroborating evidence, this researcher looked primarily towards advertisements and mechanisms used by companies to convince consumers to purchase products. No mechanism of motivation was found that conflicts with the claims of the SBST, instead all the researched advertisements could describe their persuasiveness through the SBST. How these advertisements could be described through the SBST (and examples of these advertisements) will be further described in the section titled “21 Strategies Implied by the SBST” in this paper.

The researcher also attempted to apply it to his daily life in assessing the persuasive elements found in day to day living. Again, no conflicting sources of evidence were found. However, this research includes a multitude of events that can neither be replicated nor adequately expressed so they will not be described in this paper. Although, since it was part of the research, the researcher thought it would be necessary to disclose its role in the research process.

Although no traditional experiments were conducted, this researcher hopes that providing corroborating sources of evidence will be adequate in proving the value of the SBST in its current, preliminary state. It is also hoped that its current state is sufficient to encourage other researchers to conduct further examination of the SBST through traditional means of analyses.

Science of the SBST

As shown in the research section, the scientific method was not used in the development of the SBST. As such, the SBST should not be considered scientific. The intent of the SBST in its current, preliminary, state is to be useful to academics and non-academics alike. As shown in the strategies section and applications section of this paper, the SBST (even in its current state) can be used in many scenarios involving human motivation: for the sake of recognizing a person's motivations, predicting a person's future decisions, and even purposefully altering a person's motivations.

Although the SBST is not scientific, it does make several testable claims about human motivation. These claims can be validated (or invalidated) by the scientific method, and I would encourage other researchers to apply the rigor of the scientific method to the SBST for further analysis.

In the SBST's current state, its claims have been validated by corroborating evidence. This corroborating evidence, expressed in the numerous hyperlinks and lengthy citations of this paper, has been taken from easily accessible sources so that they may be reviewed by academics and non-academics alike. It is hoped that the readers will be able to use this evidence to enhance their comprehension and see how the claims of the SBST are mirrored in reality – so they may find ways to utilize the SBST in their own lives, products, and careers.

Jenny's Decision: The Hypothetical Example of the SBST in action

Since the SBST is a systemized framework, it requires a *Subject* to be used by the SBST for it to be functional. Although, the SBST can be applied to real people to do so would require vast participants whose answers are affected by biases and research conditions, as well as requiring permissions from institutions and the consent of participants. I would implore researchers to take this line of study, however it is beyond my grasp as an independent researcher.

So, in this paper, we will use a conceptual *Subject* (named Jenny) to see the SBST in action. Jenny is a generic hypothetical character who was designed to be both familiar and comprehensible to the readers. By comprehending Jenny at a conceptual level, we may be able to empathize with her choices and the decision-making process she uses to reach her choices.

Context for Jenny's Decision

Jenny is a high school student who has poor spending habits (resulting in a moderate credit debt and little money of her own). She has recently gotten her driver's license but is still uncomfortable with driving. Jenny also has a dream of one day becoming a famous guitarist and wants to buy a new guitar to achieve this dream. She plans to put money aside, for buying her first guitar - and has been doing so for quite some time. Jenny has told others about her dream and received varying responses (some positive and some negative), but she is still dedicated to achieving this dream. Although disliking kids, as a source of income, Jenny tends to babysit for Kyle, a father of two kids, whom she has come to respect.

Jenny has recently arrived back home from school and has received a text from Kyle. The text reads as follows: “Hey Jenny, it’s Kyle, can you come over tonight to babysit the kids for \$50?” Jenny knows that she has schoolwork she should complete and by babysitting for Kyle she’s foregoing the perks of staying home, like watching TV and completing her schoolwork, although she would likely disappoint Kyle by refusing him. If she chose to go babysit for Kyle she would have to deal with his kids, but she would likely receive \$50 for her work and Kyle would appreciate it. So, Jenny is faced with a decision.

It should be noted that the context described above has been shortened and placed into the pictorial representation of the SBST. Although context should be used in conjunction with the SBST, the brief context placed in the pictorial representation is not necessarily an element of the SBST, as the succinct nature of it removes much of the pertinent information in comprehending the *Subject’s* (in this case, Jenny’s) character and the situation that the *Subject* finds itself in. The purpose of this brief context in the pictorial representation of the SBST is to be used as a reminder of the *Subject’s* context for the reader.

We will study the decision-making process that Jenny goes through, as she is offered to babysit Kyle’s kids for the night for 50 dollars.

Explaining the Elements of the SBST

Option Comparison Table

The *Option Comparison Table* is the pictorial representation of the SBST where *Options* are compared against one another. Here the *Options*, the *Options’ Option Focuses*, the *Options’* associated *Considerations*, and the *Options’* respective *Perceived Option Benefit* are pictorially expressed. The *Subject* would act *Self-Beneficially*; so, they would select the *Option* which has the highest *Perceived Option Benefit*. This representation allows the reader to easily see what *Consideration* is most greatly affecting an *Option’s Perceived Option Benefit* and which *Option* has the highest *Perceived Option Benefit*.

Only a finite amount of *Options* and *Considerations* can fit on this static pictorial representation. Perhaps an interactive representation would be able to hold more information. However, these static images will be more than suitable enough for the sake of explaining Jenny’s motivations and her decision.

Figure 1: Option Comparison Table

Figure 1. An image of the Option Comparison Table with the Evoked Set of Meta-Considerations for the Options hidden behind each of the "...}" symbols.

Figure 2: Options Comparison Table showing Meta-Considerations
Jenny's Perspective

Figure 2. An image of the Option Comparison Table with all the Considerations for the Option Titled "Babysit Kids" being shown.

Options and Option Focus

Explanation of Options and Option Focus.

An *Option* is a distinct, potential change of state (a potential *Trade*) that a person can select to exchange with their current state. A person chooses the *Option* that has the greatest *Perceived Benefit* to them. Each *Option* has its own *Benefit* which is expressed in the *Attitude* of its *Primary Considerations* and its *Option Focus*. The *Primary Considerations* will be explained later in the paper. At any given point there are a near-infinite amount of potential *Trades* that a person can take, and thus a near-infinite amount of *Options*. Asking a person to be aware of all these *Options* is non-sensical (a claim corroborated by the theory of [Bounded Rationality](#)^{Ref. 93}) thus the unimaginable amount of *Options* is mediated by *Option Focus*. *Option Focus* is the direct awareness of an *Option* and is an absolute value. This awareness can be non-existent, giving *Option Focus* a null value, or it is existent (giving *Option Focus* a positive, non-null, value that is greater than zero). *Option Focus* can increase and decrease with the amount of direct awareness applied onto that *Option*.

Mathematical Effect of Options and Option Focus.

Option Focus is multiplied by the sum of the *Primary Considerations' Attitude* (*Total Option Attitude*) resulting in an *Option's Perceived Option Benefit*. Therefore, if the *Option Focus* has a null value, regardless of what the *Total Option Attitude* of the *Option* could be, the *Perceived Option Benefit* then has a null value. Each of these possible values of the *Option Focus* would affect the selection of the *Option*. As the assumption holds that people are *Self-Beneficial* and therefore work towards their greatest *Benefit*, the *Subject* would select the *Option* with the highest *Perceived Option Benefit*.

These Mathematical relationships are intended to simulate human responses:

- Where an *Option Focus* has a null value, it simulates the act of not knowing about an *Option*, as any non-null valued *Perceived Option Benefit* would be selected over an *Option* whose *Perceived Option Benefit* was a null value ($\text{null} < -\infty$).
- Where an *Option* has a comparatively lower *Option Focus* than another, it simulates not being as aware of an *Option* in comparison to other *Options*, even if the *Subject* is aware of it to a minor degree ($12 \cdot 1.1 < 12 \cdot 1.2$).
- If the *Total Option Attitude* were significantly higher than the compared *Options*, then it would be selected by the *Subject* even if it had a comparatively lower *Option Focus* ($60 \cdot 0.5 > 12 \cdot 2.4$).
- As an *Option Focus* is closer to zero, it would mathematically lower the effect of both negative and positive *Total Option Attitudes* ($-15 \cdot 0.2 = -3$ and $15 \cdot 0.2 = 3$ meanwhile $-15 \cdot 1.2 = -18$ and $15 \cdot 1.2 = 18$). This relationship simulates a person not realizing the significance of an *Option's Benefits* (be they positive or negative) due to their lack of direct awareness placed on that *Option*.
- As an *Option Focus* get further from zero, it would mathematically increase the effect of both negative and positive *Total Option Attitudes* ($-12 \cdot 0.5 > -12 \cdot 1.2$ and

$11 * 0.5 < 11 * 1.2$). This relationship simulates that as a person becomes more aware of an *Option*, they tend to emphasize its *Beneficial* effects, be they positive or negative.

Figure 3: Options Circled

Figure 3. An image of the *Option Comparison Table* with the three *Options* which are most prominent for Jenny in her situation circled in red.

Figure 4: Option Focuses Circled

Jenny's Perspective		
Context: "Hey Jenny, it's Kyle, can you come over tonight to babysit the kids for \$50?"		
Option 1: Babysit Kids	Option 2: Stay At Home	Option 3: Take a Shower
Total Option Attitude: ??? Perceived Option Benefit: Total Option Attitude * Option 1 Focus Perceived Option Benefit: ??? * 1.25 Perceived Option Benefit: ???	Total Option Attitude: ??? Perceived Option Benefit: Total Option Attitude * Option 2 Focus Perceived Option Benefit: ??? * 1.10 Perceived Option Benefit: ???	Total Option Attitude: ??? Perceived Option Benefit: Total Option Attitude * Option 3 Focus Perceived Option Benefit: 35 * 0.54 Perceived Option Benefit: ???

Figure 4. An image of the *Option Comparison Table* with the three *Options* focuses of the most prominent *Options* for Jenny in her situation circled in red.

Jenny's Decision: The Role of Options and Option Focus.

Looking back upon the scenario in which Jenny is in, she has obvious *Options* to 'Babysit Kids' and 'Stay At Home.' However, in the near infinite amount of *Options* which Jenny may select from, Jenny could choose to 'Take a Shower.' What separates the two obvious *Options* from this more obscure one is their respective *Option Focuses*.

The *Option* to 'Babysit kids' as well as the *Option* to 'Stay At Home' both have a much higher *Option Focus* than the *Option* to 'Take a Shower.' Mathematically, since the *Option Focus* Jenny has for the *Option* to 'Take a Shower' is less than 1 (being 0.54) it would actually make the *Perceived Option Benefit* be lower than the *Total Option Attitude*, if the *Total Option Attitude* is positive and does not have a negative value. Meanwhile, if the *Total Option Attitude* was negative then a lower *Option Focus* would make it less negative. In both cases, this simulates the notion that a person would be less cognizant of the *Option's Benefits* and thus the value of an *Option* would be underrecognized in both its negative and positive attributes by the lack of direct awareness placed on the *Option*.

For Jenny, it means, under this context, that she is more aware of the *Option* to 'Babysit Kids' and would be more compelled to select it if she has a positive *Total Option Attitude* towards that *Option*. We will derive this value of *Total Option Attitude* by looking at Jenny's *Primary Considerations* in assessing each of these *Options*.

Although these three *Options* are potential changes of state for Jenny's desires an *Option* may be any potential change of state. It may be broad like the changing of an occupation. It may be granular like changing an arm's position by moving it two degrees. It can be abstract like a change in a person's *Understanding*. While the *Options* provided in Jenny's decision are only relating to changes of state in her desires, an *Option* can be any potential change of state.

Primary Considerations

Explanation of Primary Considerations.

Primary Considerations are the main reasons that are *Evoked* when assessing a potential *Trade* (an *Option*). The *Primary Considerations* used in evaluating an *Option* is called an *Evoked Set of Primary Considerations*, as the *Primary Considerations* were *Evoked* (although *Evocation* will be explained later in the paper). Each *Primary Consideration* has a value ascribed to it in the form of the *Subject's Attitude* towards it. Each *Primary Consideration* can have a positive or negative *Attitude*. An *Attitude* is the feelings a person has towards a *Consideration*. A *Primary Consideration's Attitude* is derived from the *Primary Consideration's Evoked Set of Meta-Considerations*, these will be explained later in the paper. The *Primary Considerations* that are used to assess an *Option* is called an *Evoked Set of Primary Considerations*. What *Primary Considerations* would be *Evoked* is unknown. The SBST does not explain how an *Evoked Set of Primary Considerations* is created. In its current form, the generation of possible *Primary Considerations* requires inferences based on the *Option* and assumptions on the person. However, there are also numerous well-trodden concepts and theories that point to possible sources of *Evocation*, these will be looked at later on in the paper.

Mathematical Effect of Primary Considerations.

The *Total Option Attitude* described in the previous section on *Options* and *Option Focus* is the sum of an *Option's Primary Considerations' Attitudes*; that is to say that by adding the *Attitudes* of each *Primary Consideration* in an *Option* it would result in the *Total Option Attitude*. This *Total Option Attitude* multiplied by the *Option Focus* will result in the *Perceived Option Benefit*, which ultimately determines whether an *Option* is selected or not.

These Mathematical relationships are intended to simulate human responses:

- A *Primary Consideration* with a positive *Attitude* would contribute positively towards the *Total Option Attitude*. This simulates the *Subject* recognizing the positively *Beneficial* aspects of selecting an *Option* which would then increase their valuation of that *Option*.
- A *Primary Consideration* with a negative *Attitude* would contribute negatively towards the *Total Option Attitude*. This simulates the *Subject* recognizing the negatively *Beneficial* aspects of selecting an *Option* which would then lower their valuation of that *Option*.
- Any amount of *Primary Considerations* may be associated with an *Option* allowing for many positive and negative *Primary Considerations*. This simulates the *Subject* having any given amount of reasons for selecting (or not selecting) an *Option*.

Figure 5: Primary Considerations Circled

Figure 5. An image of the *Option Comparison Table* with the *Evoked Set of Primary Considerations* for each of the *Options* displayed circled in red.

Jenny's Decision: The Role of Primary Considerations.

For each of the *Options* that Jenny is faced with in this situation there is a *Benefit*. We recognize these *Benefits* through the *Considerations* she has for each *Option*. *Primary Considerations* give the reader a view into the main reasons that would influence Jenny's decision.

Jenny is a hypothetical person whose memories, motives, and aspirations only exist within the confines of this thought experiment. Therefore, we cannot know for sure what her reasons would be for her decision. However, we can make inferences and assumptions based on her character, what we've learned about her from the context provided at the beginning of the paper, and the *Option* she is assessing. This aspect of inferring, assuming, and generating *Considerations* is explored deeper in the *Evocation* section of the paper.

The *Primary Considerations* for each *Option* reveal Jenny's main reasons for selecting an *Option*. For instance, if Jenny had a greater *Attitude* towards her schoolwork (which has an *Attitude* of -29) then she likely would have chosen to stay at home to complete it. Instead, the *Primary Consideration* of doing schoolwork lowered the *Total Option Attitude* to such an extent that Jenny would rather babysit kids and procrastinate than do her schoolwork. Likewise, without the *Consideration* of the \$50 Jenny likely wouldn't have gone babysitting. Sure, Jenny seems to care about Kyle from the first *Primary Consideration* of "Kyle's Appeal to Character" but not enough to do it for free, it seems, because without the *Consideration* of the \$50 the *Total Option*

Attitude of babysitting kids would have been -23 (12-20-15) which is significantly lower than staying at home and since Jenny, like all people, is *Self-Beneficial* she would have likely chosen to stay at home (depending on how the *Option Focuses* would have affected the *Options' Perceived Option Benefit*).

The *Attitudes* of each of these *Primary Considerations* can have drastic impacts on a person's decision. Recognizing the source of these *Attitudes* is vital in comprehending a person's motivations. The *Attitudes* of these *Primary Considerations* come from each of their *Meta-Considerations* (which in the picture are hiding behind each "...}" symbol of an ellipsis followed by a curly brace).

Meta-Considerations

Explanation of Meta-Considerations.

Meta-Considerations are the reasonings behind a *Primary Consideration* and they describe our reasonings for why we hold a certain *Attitude* towards a *Primary Consideration*. These reasonings should, ultimately, specifically and legibly express each of the *Benefits* that the *Subject* has identified within the *Primary Considerations*. *Meta-Considerations* are quite similar to *Primary Considerations* as both *Meta-Considerations* and *Primary Considerations* are a type of *Consideration*, and thus both are *Evoked* and have a value ascribed to it in the form of the *Subject's Attitude* towards it.

Meta-Considerations, like *Primary Considerations*, also help make the *Benefits* associated with an *Option* more legible. For example (as shown in Jenny's situation), the *Benefit* of paying off credit card bills seems to have no relevance to babysitting kids...however, with *Considerations*, a person can track the *Subject's Considerations* and see how paying off credit card bills relates to babysitting kids. As the *Meta-Consideration Titled* "Paying off credit card bills" is one of reasonings behind the valuation of the *Primary Consideration Titled* "Get \$50." Without these *Meta-Considerations*, it would be far more difficult to ensure that all the *Perceived Benefits* a *Subject* has recognized in an *Option* are being represented.

The *Meta-Considerations* used in evaluating a *Primary Consideration's Attitude* is called an *Evoked Set of Meta-Considerations*, as the *Meta-Considerations* were *Evoked* (although *Evocation* will be explained later in the paper). Each *Meta-Consideration* has an *Attitude* which is described by the sum of the *Attitudes* held in the *Meta-Considerations* directly posterior to it in its set. This recursive process of acquiring value from the directly posterior *Considerations* (*Considerations* to the left of it, in the pictorial representation of the SBST) continues down each line of *Meta-Considerations* until the last *Meta-Consideration* which is always the *General Impressions* and this is where the all its anterior *Considerations* (*Considerations* to the right of it, in the pictorial representation of the SBST) ultimately derive their *Attitude*. *General Impressions* will be explained in a later part of the paper. A *Primary Consideration* may have any amount of *Meta-Considerations* (greater than zero, as *General Impressions* is a necessary *Meta-Consideration*) in reasoning its *Attitude*. These *Meta-Considerations* may branch out but there will always be a *General Impressions* at the end of each line.

Mathematical Effect of Meta-Considerations.

Mathematically, every *Consideration's Attitude* is equal to the *Attitude* of its directly posterior *Meta-Considerations*. A *Consideration*, independent of *General Impressions*, has no value in its *Attitude*. Although it may seem that the *Considerations* do not directly affect the mathematics of the SBST, since it is all derived from the *General Impressions*, the *General Impressions* at the end of each set of *Meta-Considerations* takes into account its directly anterior *Consideration* in how it yields its value. Visually, these mathematical relationships become far more evident and will become more so once *General Impressions* has been explained later in the paper.

These Mathematical relationships are intended to simulate human responses:

- *Meta-Considerations* posterior to a *Consideration* can branch out, allowing for several different *Benefits* to be identified for that *Consideration*. This simulates that the *Subject* may have several lines of reasoning behind their *Attitude* towards a *Consideration*, and that the *Subject* may identify many different *Benefits* (positive and/or negative) for a given *Consideration*.
- Each line in an *Evoked Set of Meta-Considerations* can contain any amount of *Meta-Considerations* (greater than zero, as *General Impressions* is always necessary). This simulates that some lines of reasoning behind an *Attitude* may be more thought out, and thus have more underlying reasons, as compared to others with shorter lines of *Meta-Considerations*.
- The *Meta-Considerations* branching behind a *Consideration* can include both positive and negative *Meta-Considerations*. This simulates that the reasons that the *Subject* has are for an *Attitude* are not entirely positive nor entirely negative (the *Perceived Benefits* for a reason may include positive and negative *Perceived Benefits*).
- A *Primary Consideration's Attitude* is equivalent to the sum of all the *General Impressions* in its *Evoked Set of Meta-Considerations*. This is due to the *General Impressions* ultimately being the source of value for all its anterior *Considerations*. This relationship simulates that a person's *Attitude* towards a *Consideration* ultimately comes from the *Benefits* that have been identified for that *Consideration*.
- The value of each *Meta-Consideration* is passed forward towards its anterior *Consideration*, and keeps going forward until being fed into the *Primary Consideration*. This relationship means that the *Attitudes* of the *Meta-Considerations* become the source of the *Attitude* associated with their *Primary Consideration*. This simulates the underlying reasons a *Subject* has for a main reason affect that main reason (which positively or negatively affects an *Option*)
- If the sum of the *General Impressions* posterior to a *Primary Consideration* is equal to zero, then the *Primary Consideration* has an *Attitude* equal to zero. This simulates the *Subject* having an equal balance of positive and negative underlying reasons for a main reason used in assessing an *Option*, and it thus having a neutral effect on their evaluation of an *Option*.

Jenny's Perspective

Context: "Hey Jenny, Kyle, can you come over tonight to babysit?"

Option 1: Babysit Kids

General Impressions	Attitude	Current supply of money	Attitude	Value of \$50	Attitude	Kyle's Appeal to Character	Attitude
General Impressions	+16	Current supply of money	+16	Value of \$50	+45	Kyle's Appeal to Character	+12
General Impressions	+33	Buying a new guitar	+33	Trust in Kyle to pay the \$50	+19	Get a ride	+64
General Impressions	+4	Paying off credit card bills	-4	Cost of Gas	-9	Have a drive to Kyle's house	-20
General Impressions	-9	Plans to use money	+29	Time spent driving	-15	Get to entertain kids for the night	-15
General Impressions	-15	General Impressions	+19	Get to practice driving	+4		
General Impressions	+4	General Impressions	-15				

Total Option Attitude: +41

Perceived Option Benefit: Total Option Attitude* Option 1 Focus = 41*1.25 = 51.25

Jenny's Decision: The Role of Meta-Considerations.

The *Meta-Considerations* we see in Jenny's circumstance have been placed based inferences and assumptions based on her character, what we've learned about her from the context provided at the beginning of the paper, and the *Option* she is assessing. Although they, like *Primary Considerations*, have been *Evoked*.

So, let's follow it. In asking why the *Attitude* of receiving \$50 ("Get \$50") has its value, we find that the reasons would be the trust she has in Kyle to pay her the \$50 for babysitting ("Trust in Kyle to pay \$50") and the value she places on \$50 ("Value of \$50"). It should be noted

that \$50 dollars does not have an objective value among all people; it may be valued by some higher than others. For Jenny, a high schooler, the value of \$50 is quite high.

In asking why the *Attitude* associated with the value she places on \$50 (“Value of \$50”) has its value, we find that the reasons would be her current supply of money (“Current supply of money”) and her plans to use that money (“Plans to use money”). We see that reasons used in her valuation of money (“Value of \$50”) are rooted in how she can use that money (“Plans to use money”) and how much money she has (“Current supply of money”) meanwhile other people may have many other reasons for how they value money. Jenny’s valuation is uniquely her own and will be explored in the section on *Evocation*.

In asking why the *Attitude* of her plans to use the money (“Plans to use money”) has its value, we find the reasons to be paying off her credit card bills (“Paying off credit card bills”) and buying a new guitar (“Buying a new guitar”). We see that the *Meta-Consideration* which has the *Consideration Title* of “Paying off credit card bills” has a negative effect on the *Attitude* she has towards her plans to use the money (“Plans to use money”). Mathematically we see this in the sum of their values: 33 (from the *Consideration Titled* “Buying a new Guitar”) plus -4 (from the *Consideration Titled* “Paying off credit card bills”) equals 29 (from the *Consideration Titled* “Plans to use money”). Why does Jenny have a negative *Attitude* towards paying off her credit card bills (“Paying off credit card bills”)? Perhaps she feels that the money would be better spent elsewhere, or maybe it’s a reminder of her poor spending habits, whatever the case may be it has a negative effect that ripples out all the way to the *Attitude* of the *Primary Consideration* “Get \$50.”

We will continue looking at the *Meta-Consideration* with a *Consideration Title* of “Buying a new guitar” however when we look at why it has its value, we hit a special kind of *Meta-Consideration* called *General Impressions*. This special kind of *Meta-Consideration* is the place where all anterior *Considerations* receive their *Attitude* and it will be explained later in the paper.

Evocation

Explanation of Evocation.

To say that a *Consideration* is ‘*Evoked*’ means, in the SBST, that is created by unknown means. The *Considerations* each person has in response to an *Option* may differ wildly. One could assume that these unique *Considerations* are due to the differences in a person’s heredity or their life-experiences. The SBST attempts not to make these assumptions. Rather, it simply acknowledges that *Considerations* exist, they have an associated *Attitude* which is ultimately derived from *General Impressions*, they have an associated *Consideration Title*, and that they are likely created by some means which it calls ‘*Evoking*’. The SBST does not explain how an *Evoked Set of Considerations* is created. In its current form, the generation of possible *Considerations* requires inferences based on the *Option* and assumptions on the person. However, there are several well-trodden concepts and theories which point to possible sources of *Evocation*.

Possible Sources of Evocation.

The mathematical effects of *Evocation* have already been expressed in the *Primary Considerations* and *Meta-Considerations* sections of the paper, so it will not be reiterated here. While the SBST is a nascent idea we can look to past theories, concepts, and practices to see how they can be used to explain possible sources of a person's *Considerations* when comparing *Options*. These possible sources of *Evocation*, in reference to the SBST, aim to recognize and organize the *Subject's* identified *Benefits* of an *Option* into specific and legible *Considerations*.

- Techniques for [Consumer Segmentation](#)^{Ref. 11} have been developed for marketers to establish commonly *Evoked Considerations* for a segment of their consumer population. These Consumer Segmentation techniques typically view the sources of *Evocation* to be [Demographic](#)^{Ref. 14} factors, [Behavioral](#)^{Ref. 15} factors, [Psychographic](#)^{Ref. 12} factors, and [Geographic](#)^{Ref. 13} factors.
- Need-Based Motivation Theories like [Maslow's Hierarchy of Needs](#)^{Ref. 57} view the sources of *Evocation* to be a person's needs; that when a person is contemplating whether to select an *Option* the *Evoked Considerations* are going to be in regards to how the *Option* helps them satisfy their needs.
- Other ideas have been put forth regarding commonly *Evoked Considerations* for specific kinds of *Options*. One of these being the *Evoked Considerations* for performing jobs as explained by [Hackman and Oldham's Job Characteristic Model](#)^{Ref. 34}. This Model views the source of *Evocation* to be the core characteristics of the job itself. Therefore, each *Option* would have *Considerations* that relate to the core characteristics of that *Option*.
- We may also identify common *Considerations*, which can be used to generalize a group of individuals.
 - An example of a common *Primary Consideration* would be found in *Interpersonal Trades*. When a *Trade* has been put forward to a person by another entity (be it another real-person or a brand) there tends to be an [Appeal to Character](#)^{Ref. 30} involved in evaluating whether or not the person should select that *Option* (as in the case of a brand's character influencing a person's decision in purchasing their products).
 - Another common *Consideration* would be the achievement of previously chosen goals. If an *Option* might be effective in achieving a goal or be counterproductive in achieving a goal, it would be a *Consideration* used in assessing an *Option* to determine whether it should be selected.

Figure 7: Evoked Sets of Meta-Considerations and an Evoked Set of Primary Considerations

Figure 7. An image of the *Option Comparison Table* with all the *Considerations* for the *Option* that has an *Option Title* of “Babysit Kids.” The *Primary Considerations* of the *Option* are called an *Evoked Set of Primary Considerations*. The *Meta-Considerations* behind each *Primary Consideration* is an *Evoked Set of Meta-Considerations*. The red braces are meant to show the organization of an *Evoked Set of Meta-Considerations* as well as its source (by following the point on the right side of the curly brace).

Jenny's Decision: The Role of Evocation.

For Jenny's decision, her *Considerations* were chosen based on inferences about the *Option* and assumptions about her character (which was derived from the context described earlier in the paper).

However, a person using the SBST may come to different conclusions based on inferences about the *Option* presented and assumptions about the character of the *Subject*. Also, the person using the SBST may not have the advantage of a detailed description of their *Subject*. So, it may be important to identify more formal structures than the current method of *Evocation*. Some of these formal structures can be found in the possible sources of *Evocation* described earlier and we can apply them to Jenny's situation.

Using Consumer Segmentation to Generate Jenny's Considerations.

If we were using [Consumer Segmentation](#)^{Ref. 11} as our source of *Evocation* we would look at several variables which differ in relevance as we look the various factors that could affect Jenny. Many of these variables were not detailed in the context (as they were not needed for the This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

method of *Evocation* that we used). These variables may be acquired by asking Jenny (or whomever the *Subject* is) or by asking some other person (or database) which has the information.

[Demographic](#)^{Ref. 14} factors use variables like age, life-cycle stage, gender, and income. Jenny's age would be that of a high schooler. Her life-cycle stage would be that of a teenager. Her gender would be female. Her income would be dependent on how often she babysits for Kyle, the average payment for babysitting, and whether she has any other means of revenue generation. Then assumptions can be made from the collection of this information. They could ask what is important to a person of a high schooler's age; what reasons would they use to assess an *Option*? What reasons would a teenager use in the assessment of an *Option*? How would a *Subject's* gender affect their reasons for selecting an *Option*? What reasons would a person at that income level use in the assessment of an *Option*? The same applies for each of the various factors: [demographic](#)^{Ref. 14}, [behavioral](#)^{Ref. 15}, [psychographic](#)^{Ref. 12}, and [geographic](#)^{Ref. 13}. Since these questions require information that we (from the context provided earlier) do not have, I will not pursue these questions (as they would add additional information to Jenny's situation that is not necessary for the rest of the paper).

The problem with this source of *Evocation*, as seen in the application to Jenny's situation is that Consumer Segmentation is too broad. It was developed to look at segments in the market not individual people. The SBST looks at an individual person and analyzes their motivations. Using the variables associated with each of the factors described by consumer segmentation, an imprecise representation of the *Subject* can be created but it may be precise enough to be useful.

Using Maslow's Hierarchy of Needs to generate Jenny's Considerations.

[Maslow's Hierarchy of Needs](#)^{Ref. 57} gets around this issue of generality by looking at the individual person and analyzing their needs. In this possible source of *Evocation*, we can assume that the five needs described by Maslow's hierarchy of needs are Jenny's *Primary Considerations*. These needs include: physiological needs, safety needs, belongingness and love needs, esteem needs, and self-actualization needs.

Then, we could place *Meta-Considerations* behind each of these *Primary Considerations* to describe the reasonings behind them. For self-actualization needs it may have the *Meta-Considerations Titled*: "Buying a new guitar", "Time spent driving." For esteem needs it may have the *Meta-Consideration Titled*: "Get to practice driving." For belongingness and love needs it may have the *Meta-Considerations Titled*: "Kyle is a kind man", "Kyle respects my time", and "Have to entertain kids for the night." For safety needs it may have the *Meta-Considerations Titled*: "Trust in Kyle to pay the \$50", "Cost of gas", "Current supply of money", and "Paying off credit card bills." Each of these *Meta-Considerations* would be followed by *General Impressions* which passes the *Attitude* forward to the *Primary Considerations*. There did not seem to be any physiological needs as babysitting kids did not seem to have any *Considerations* for Jenny that were directly linked to her physical well-being (possibly because she has adequately satisfied her physical needs).

This possible source of *Evocation* allows for a highly individualistic analysis of the *Subject*, which is advantageous for the SBST. It also provides a formal structure to what kinds of *Considerations* could be *Evoked*. The difficulty with it though, is organizing the *Meta-Considerations*. Money, for instance, may satisfy any number of a person's needs. Therefore, any *Consideration* that involves money may fall into a physiological need (to purchase food), an esteem need (to own lots of money), or self-actualization needs (if that purchase helps the *Subject* perform creative activities). If this possible source of *Evocation* were to be used, the *Consideration Titles* would have to be far more expressive in describing their *Benefits*. However, if a high level of specificity is feasibly reached with the *Subject*, then this may be a useful source of *Evocation*.

Using Option-based methods to generate Jenny's Considerations.

This approach to *Evocation* looks at the characteristics of the *Option* and inputs relevant *Considerations* based on those characteristics.

This approach was used in [Hackman and Oldham's Job Characteristic Model](#)^{Ref. 34} where the researchers analyzed the characteristics of modern jobs and turn them into critical psychological states (which can be easily described as *Considerations*, as they are the *Beneficial* effects of the job).

This approach was also used by Dave Mark in his [Infinite Axis Utility System](#)^{Ref. 55} (his part of this conference begins at 33:35). The SBST and the Infinite Axis Utility System are quite similar, making this approach easily transferrable into the SBST. The Infinite Axis Utility System is mainly used in video games to describe the AI of NPC's. There are also key differences such as: actions are used in place of *Options* (which include actions alongside any other change of state), a lack of *Option Focus* (all *Options* have an equal amount of awareness), it uses a function in place of *General Impressions* (and all the advantages it provides), and its *Considerations* have an associated specific value that fully describes it for use in the function (like "Enemy health" having an associated float value of 12.5) which is useful in the simulated environments that the Infinite Axis Utility System is meant to be used but not with human beings who have difficulty with identifying such specifics about their environment. It's similarities though make its approach to generating *Considerations* for each action transferrable to the SBST. The *Considerations* for its actions are pre-decided by the developer of the video game to describe which *Considerations* would be relevant for each possible action by recognizing the characteristics of that action. This approach has proven useful for developing realistic behaviors for video game characters that are easily comprehended by the video game developers; so, it may also be useful in evoking *Considerations* that adequately represent the *Subject's Perceived Beneficial* effects of an *Option* in a specific and legible manner.

Applying this approach to Jenny's situation we can see its advantages. It should be noted that this approach assumes we have more information than given in the context. It also takes into account some of the assumptions made in the illustration's method of *Evocation* and turns them into prior *Options* which must be selected (such as having to choose the method of transportation rather than assuming she would use a car). For Jenny to "babysit kids" it requires that Jenny be present in close proximity to the kids. Since she is at her home and not in close proximity to the

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kids, she would have to become in close proximity through traveling which (based on her being a high schooler) might be via riding the bus, walking or driving. There is no bus pick-up in her area. So, the choices for transportation would include walking or driving. If she chose to walk, then the physical safety of the chosen walking area and distance of the walk would be *Considerations*. If she chose to drive, it would require that she have a driver's license and a car to drive, both of which she has. To drive a car requires skill, time, and fuel, so her skill level in driving, her time spent driving, and the fuel expenditure would likely be *Considerations* for driving. There is a long distance between her neighborhood to Kyle's home (where the kids would likely be). Since the distance of the walk would be very long, and is a *Consideration* for walking, it would likely make driving more preferable to walking. This assumes that the *Considerations* for driving are more positive than that of walking and she has a positive *Option Focus* towards driving. Making these assumptions, it can be determined that Jenny would choose to drive to Kyle's house and thus the *Considerations* for driving would be included in her decision to babysit or not.

That lengthy analysis goes through one single characteristic of the *Option* (being in close proximity to the kids for babysitting) there are also other characteristics like payment, time spent babysitting, kids involved in babysitting, activities performed during babysitting, the environment that the babysitting is taking place, and the relationship of the person requesting to babysit. These characteristics are intrinsic to the *Option* of babysitting and could generate almost all the *Considerations* involved in the illustration.

This approach can be very thorough and, with more information, fewer assumptions can be made. Since this possible source of *Evocation* is more information-driven than the others it might be the most reliable, as assumptions are part of each of the previously presented possible sources of *Evocation*, but this approach can reduce those assumptions with more information about the *Subject* and information that would be relevant to the *Subject* in making their decision.

The problem with this approach is that it looks at the more at *Option* rather than the *Subject*. It sees what characteristics are intrinsic to the *Option* presented, then it makes assumptions based on the person on how they might react to each of these characteristics, then it generates *Considerations* that are relevant to those characteristics and what its assumed about the person. By starting at the *Option*, rather than the *Subject*, there are *Considerations* that might be missed which the person has that are only tangentially related to the *Option*. For example, Jenny wanting to buy a guitar to satisfy her dream of becoming a famous guitarist is relevant to the *Option* because the money received for babysitting could be used in buying the guitar but it is so tangential from the characteristics of the *Option* that it might be missed by this possible source of *Evocation*. The *Subject* may also not be using every characteristic of the *Option* in their valuation of the *Option* – as the *Subject* may be ignorant of some of these characteristics and thus cannot assess the *Benefits* of unknown characteristics. Also, this possible source of *Evocation* has the same issue that is shared by all of the possible sources of *Evocation* shown in this section, which is a lack of information. The *Option Title* “Babysit Kids” only provides so much information, there may be other factors involved in the *Option* that are not described in that *Option Title*. This is why having a thorough context is important; to better comprehend all the factors and relevant

information which the *Subject* may use to assess the *Benefits* of the *Option*. From this comprehension, the *Benefits* can be identified and organized into specific and legible *Considerations* (which is what all of the possible sources of *Evocation* have attempted to do).

General Impressions

Explanation of General Impressions.

At the end of a length of *Meta-Considerations* comes the final *Meta-Consideration* called *General Impressions*. This is where the rationalization of “why” you (representing the *Subject*) feel a certain way falls apart and you (representing the *Subject*) “just feel” that way. At this point a person may say “I just like it” or they may attempt to rationalize their feelings through a broad explanation of how someone else might reach that conclusion, although it doesn’t necessarily pertain to them nor their situation.

An example of this broad explanation would be explaining yourself through evolutionary biology and how the human body has a tendency to “like” certain things and expresses this through shots of endorphins. This explanation may describe how another being of the human race might come to a conclusion by does not necessarily explain why you (as the *Subject*) feel that way.

The value of *General Impressions* is passed into its directly anterior *Consideration*. This is repeated for each anterior *Consideration* (and *Considerations’ Attitudes* are summed if there is more than one *Consideration* posterior to a *Consideration*) until its value is passed into the *Primary Consideration*. One may imagine this as a recursive process whereby the *General Impressions* are the value that is passed upwards to the point where the recursive process began: the *Primary Consideration*. This means that the sum of the *General Impressions* behind a *Primary Consideration* is equal to the *Attitude* of the *Primary Consideration* it is behind.

It should be noted that the point where *Considerations* end to reach the final *Meta-Consideration* of *General Impressions* is *Subjective*. For example, a neuroscientist may have a long line of *Meta-Considerations* to justify why he likes drinking alcohol (as the neuroscientist would recognize many of the *Benefits*, both positive and negative, that are received from drinking alcohol). Meanwhile, the casual drunkard may simply like the feeling of being drunk and after that single *Consideration* they reach the point of *General Impressions* (as they do not recognize any of the *Benefits* of drinking alcohol besides the sensation of feeling drunk).

The point of *General Impressions* is one that I do not fully *Understand*. It is likely a concoction of illegible chemical reactions in the body which through some means (still unexplained by neuroscience due to the [explanatory gap](#)^{Ref. 98}) form the mind. Perhaps it describes some spiritual feeling that originates beyond the body. Perhaps it is a form of will. I do not know and nor does the SBST, in its current form, profess to know. So, instead, I (as the developer of the SBST) have used a substitute, based on [Social Exchange Theory](#)^{Ref. 97}, to explain the impact of *General Impressions*. This substitute is the *Three Benefits*.

Figure 8: General Impressions Circled
Jenny's Perspective

Figure 8. An image of the *General Impressions* of the Option Titled “Babysit Kids” circled in red. Each of these *General Impressions* gain their value from the substitute called the *Three Benefits*.

Three Benefits

The *Three Benefits*, as stated earlier, is a substitute for *General Impressions*. Thus, the *Three Benefits* is used in each place that *General Impressions* would be used. The *Three Benefits* assesses the *Consideration* that is directly anterior of it in how it yields its value. The *Three Benefits* are comprised of 3 types of *Benefits*, which are differentiated by when the *Benefit* is received, and they are as follows: *Immediate Benefits* (*Benefits* received in a short period of time), *Forecasted Benefits* (*Benefits* received in the future), and *Cumulative Benefits* (*Benefits* that were received in the past). The sum of all 3 *Benefits* is the value of the *Three Benefits* which, as a substitute for *General Impressions*, is passed into the *Attitude* of the *General Impressions* that it is substituting.

Each of these *Benefits* are quite similar to one another, so the paper will go into detail about the *Immediate Benefits* and then describe the differences found in the *Forecasted Benefits* and *Cumulative Benefits* – in their respective sections.

Immediate Benefits.

The *Immediate Benefits* are *Benefits* that are received in a short time period from the present. The *Immediate Benefits* is comprised of 5 main components:

1. Immediate Ambiguity

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2. *Immediate Rewards*
3. *Immediate Costs*
4. *Innate Aspects*
5. *Trade History*

Another important value of *Immediate Benefits* is the *Perceived Immediate Value* which is equal to the *Immediate Rewards* minus the *Immediate Ambiguity* minus the *Immediate Costs* ($\text{Perceived Immediate Value} = \text{Immediate Rewards} - \text{Immediate Ambiguity} - \text{Immediate Costs}$). This distinction is made for the user of the SBST to observe how the *Subject* evaluates the *Immediate Benefits* of the directly anterior *Consideration* purely based on their *Opinions/Understanding* of it.

The *Perceived Immediate Value* is multiplied by the *Innate Aspects* and *Trade History* resulting in the *Immediate Benefit* ($\text{Immediate Benefit} = \text{Perceived Immediate Value} * \text{Innate Aspects} * \text{Trade History}$). This value includes their *Innate Aspects* and *Trade History* which are easily susceptible to change, as more *Trades* occur, time between *Trades* elapses, or the *Subject's Innate Aspects* are altered.

Each of these components are fundamental to the SBST, so any changes (by increasing or decreasing its value) can have significant effects on the selection of an *Option*. By increasing or decreasing any of these components it would affect the valuation of the *Immediate Benefit*, which would affect the valuation of the *Three Benefits*, which would affect the valuation of the *Primary Consideration*, which would ultimately affect the valuation of the *Option*. For the sake of brevity, this mathematical significance will not be reiterated for each component in their mathematical effects.

Figure 9: Immediate Benefits

Three Benefits: Immediate Benefit

Immediate Benefit assesses a Consideration's short-term Benefits.

Figure 9. An image of the *Immediate Benefit*, which is assessing the short-term *Benefits* of the *Consideration* Titled “Buying a new guitar”.

Immediate Ambiguity.

A *Consideration's Immediate Ambiguity* is described as the *Perceived* lack of *Opinions/Understanding* towards the *Benefits* (which are expected to be received within a short period of time) of a *Consideration*.

If a person feels as though they don't have a thorough or complete *Opinions/Understanding* of a *Consideration's Benefit* within a short period of time, then this is a form of *Immediate Ambiguity*. Having *Immediate Ambiguity* lowers the value of a *Consideration's Immediate Benefits*. However, one method that reduces a *Consideration's Immediate Ambiguity* is via the *Subject* using their limited *Opinions/Understanding* to fill in their *Perceived* lack of their *Opinions/Understanding*- which could be seen as a form of data interpolation or extrapolation based on their *Opinions/Understanding* and the nature of their *Immediate Ambiguity*.

Mathematical Effect of Immediate Ambiguity.

- *Immediate Ambiguity* may be lowered. This simulates a person satisfying their apprehension towards a *Consideration*, either by expanding their *Opinions/Understanding* to encompass that which they *Perceived* as being lacking or they come to the *Perception* that they do not lack *Opinions/Understanding* through some other means (like being convinced that they already have full awareness and do not lack

Opinions/Understanding, or the process described above regarding interpolation and extrapolation).

- *Immediate Ambiguity* is not rigid, it can both decrease and increase. A person's *Perceived* lack of *Opinions/Understanding* is a state, a state which can be changed voluntarily (and thus trackable through the SBST) or involuntary (perhaps through a head injury). Recognizing the flexibility of *Immediate Ambiguity* simulates the flexible nature of human *Perceptions*.
- *Immediate Ambiguity* decreases the *Perceived Immediate Value* of a *Consideration*. This is an assumption that a person who *Perceives* that they have a lack of *Opinions/Understanding* towards a *Consideration* will view this lack as negative and it will act to disincentivize them from selecting the *Consideration's* associated *Option*.
 - A potentially proposed source of conflicting evidence on this matter would be the actions of adventurous thrill-seekers. These people seem to desire situations that they have a *Perceived* lack of *Opinions/Understanding*. The thrill-seeker [jumps off a plane](#)^{Ref. 48} (with a parachute) not knowing whether it will be their last jump. In cases like this, there is the *Perception* of the unknown. The SBST would acknowledge these individuals' decisions by stating that they do it in spite of the unknown; not because of it.
 - The thrill-seeker may have the *Understanding* that they will receive an adrenaline rush from jumping off the plane and they have a positive *Opinion* of excitement towards that *Understanding*. The thrill-seeker may also have an *Understanding* that the adrenaline rush from jumping off a plane is a uniquely gratifying experience and they have a positive *Opinion* of pride and excitement towards their *Understanding*. These *Opinions/Understandings*, to the thrill-seeker, would act as *Rewards* which incentivize the behavior. Meanwhile, they also *Understand* that there is a slim chance that they could be killed in the jump, they would have a *Perceived* lack of *Understanding* towards this as they do not know for sure if they will die or not. This *Perceived* lack of *Opinions/Understanding* from the possibility of death acts as a source of *Ambiguity*. However, the thrill-seeker still jumps off the plane because the positive *Benefits* from the *Rewards* are greater than the negative impact of the *Ambiguity*.
 - Potential sources of corroborating evidence may be found in the numerous occasions of people who treat *Ambiguity* as a negative component in their decision-making process. Primarily, this is seen in people fearing the unknown (fear, generally, being a negative emotion that disincentivizes behavior). This can be seen cases ranging from tribalistic [xenophobia](#)^{Ref. 99} to the fear of [buying a house](#)^{Ref. 46}. In both cases, it is not that the person is omniscient and fully justified in their fear, rather it is that they *Perceive* that they lack *Understanding* and thus they have a lack of *Opinions/Understanding*.
 - This lack of *Opinions/Understanding*, as shown above, acts as a disincentive in the decision-making process and so *Ambiguity* is treated as negative. Whether these refutations of conflicting evidence and offering of corroborating evidence is enough to convince the reader, the SBST still makes this assumption.

Figure 10: Immediate Ambiguity Circled

Three Benefits: Immediate Benefit

Immediate Benefit assesses a Consideration's short-term Benefits.

Figure 10. An image of the *Immediate Ambiguity* for the *Benefits* of the *Consideration* Titled “Buying a new guitar” circled in red.

Jenny’s Decision: The Role of Immediate Ambiguity.

Since Jenny will only be buying the guitar in the future, i.e. after she has gotten the money from Kyle and whenever she has time to make the purchase, the *Benefits* of this *Consideration* would be mainly received in the future.

However, Jenny may have a *Perceived* lack of *Opinions/Understanding* towards whether she should be putting money aside for a new guitar right now. Since Jenny has never owned a guitar (as shown in the context) she may recognize that she does not have a complete *Understanding* of the difference between a new guitar and a pre-owned guitar. In the short-term, Jenny could change this plan of putting aside money for a new guitar to a pre-owned guitar or some other purchase. So, in the *Immediate* sense, this *Perceived* lack of *Opinions/Understanding* creates *Ambiguity* for the *Consideration* of “Buying a new guitar.” Her *Ambiguity* reduces the *Immediate Benefit* of this *Consideration*.

Immediate Rewards.

A *Consideration’s Immediate Rewards* is described as a *Consideration’s Perceived* positive *Benefits* received in a short period of time. These *Perceived* positive *Benefits* are derived from what the *Subject Understands* about a *Consideration* and how they feel about what they *Understand* (their *Opinions/Understanding* towards a *Consideration*).

In other words, if a *Subject* deems (based on what they *Understand* about a *Consideration* and how they feel about that *Understanding*) a *Consideration* to be positively *Beneficial* to them within a short period of time, then this is a form of an *Immediate Reward*.

Mathematical Effect of Immediate Rewards.

- *Immediate Rewards* increase the value of a *Consideration's Immediate Benefits*.
- Changing a *Subject's Understanding* towards a *Consideration* can lower or increase the *Immediate Rewards* of that *Consideration*
- Changing a *Subject's Opinion* towards a *Consideration*, can lower or increase the *Immediate Rewards* of that *Consideration*

Figure 11: Immediate Rewards Circled

Three Benefits: Forecasted Benefit

Forecasted Benefit assesses a *Consideration's* future Benefits.

Figure 11. An image of the Immediate Rewards for the Benefits of the Consideration Titled “Buying a new guitar” circled in red.

Jenny's Decision: The Role of Immediate Rewards.

Although the purchase of the guitar would happen in the future, Jenny might be *Rewarded* in the short-term by the achievement of her goal. She decided to put aside money for a new guitar, and she has taken steps to achieve this by babysitting for Kyle. Jenny would *Understand* that, as a consequence of babysitting, she would have more money to set aside for buying her first guitar and she would have a positive *Opinion* towards this *Understanding* (perhaps feeling satisfaction or pride). Her sense of achievement would be *Rewarding* in the *Immediate* sense. This *Immediate Reward* would increase the *Immediate Benefit* of this *Consideration*.

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Immediate Costs.

A *Consideration's Immediate Rewards* is described as a *Consideration's Perceived* negative *Benefits* received in a short period of time. These *Perceived* negative *Benefits* are derived from what the *Subject Understands* about a *Consideration* and how they feel about what they *Understand* (their *Opinions/Understanding* towards a *Consideration*).

In other words, if a *Subject* deems (based on what they *Understand* about a *Consideration* and how they feel about that *Understanding*) a *Consideration* to be negatively *Beneficial* to them within a short period of time, then this is a form of an *Immediate Cost*.

Mathematical Effect of Immediate Costs.

- *Immediate Costs* decrease the value of a *Consideration's Immediate Benefits*.
- Changing a *Subject's Understanding* towards a *Consideration* can lower or increase the *Immediate Costs* of that *Consideration*
- Changing a *Subject's Opinion* towards a *Consideration* can lower or increase the *Immediate Costs* of that *Consideration*

Figure 12: Immediate Costs Circled

Three Benefits: Immediate Benefit

Immediate Benefit assesses a *Consideration's* short-term *Benefits*.

Figure 12. An image of the *Immediate Costs* for the *Benefits* of the *Consideration* Titled “Buying a new guitar” circled in red.

Jenny's Decision: The Role of Immediate Costs.

The main *Immediate Cost* of putting money aside for this new guitar is that the money cannot be used for anything else. Jenny would *Understand* that putting more money aside for this new guitar means that she cannot use the money for anything else she might want to buy; Jenny

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would have a negative *Opinion* towards this *Understanding* (perhaps feeling frustration). This *Immediate Cost* would decrease the *Immediate Benefit* of this *Consideration*.

The *Perceived Immediate Value* may still be positive if the *Immediate Reward* Jenny has is greater than the *Immediate Cost* and the *Immediate Ambiguity*. So, if her sense of achievement in putting aside the money for buying herself a new guitar is greater than the limitation on her purchasing power and her *Perceived* lack of *Opinions/Understanding* on “Buying a new guitar,” then the *Perceived Immediate Value* would be positive. Which, in this case, it is not. The *Immediate Costs* and *Ambiguity* she has for this *Consideration* outweigh the *Immediate Rewards*. So, the *Perceived Immediate Value* for this *Consideration* is negative.

Innate Aspects: Impulsiveness.

An *Innate Aspect* is described as the fluctuating inclinations of a person caused by their internal factors, such as a person’s mental capabilities and their dispositions. *Innate Aspects* of the *Immediate Benefit* differ from the *Forecasted Benefits* and *Cumulative Benefits* in their most influential *Innate Aspect* involved in *Modifying* the valuation of their respective *Benefit*. The most influential *Innate Aspect* for *Immediate Benefit* is *Impulsiveness*.

Impulsiveness is described as a person’s inclination of being swayed by short-term gains and losses. If a person is currently feeling *Impulsive*, then they would be more swayed by a *Consideration’s Perceived Immediate Value* than a person who is less *Impulsive*. The *Innate Aspects* of *Immediate Benefits*, (predominantly *Impulsiveness*) is multiplied by the *Perceived Immediate Value* to become a *Modifier* of the *Perceived Immediate Value* (*Immediate Benefit’s Innate Aspects * Perceived Immediate Value*). The *Immediate Benefit’s Innate Aspects* can either increase or decrease the value of a *Consideration’s Immediate Benefits*.

- This depends on how high or low a person’s *Innate Aspects* of *Immediate Benefits* are, though it is predominantly influenced by a person’s *Impulsiveness*, as well as whether the *Perceived Immediate Value* is positive or negative.

Innate Aspects, like *Impulsiveness*, have probable sources. In the SBST’s definition of *Innate Aspects* it stated that they are caused by a person’s internal factors, such as their mental capabilities and their dispositions. Thus we may assume causality between a person’s mental capabilities affect a person’s *Impulsiveness* (as we see with [Lobotomies causing some patients to become Impulsive](#)^{Ref. 100}) we may also assume that a person’s dispositions affect their *Impulsiveness* (as we see in the many causes of *Impulsiveness* relating to [biological](#)^{Ref. 21} and [emotional](#)^{Ref. 8} dispositions). However, the exact manner in which these internal factors affect *Innate Aspects* (like *Impulsiveness*) is not explained by the SBST. Rather the SBST simply acknowledges the relationship *Innate Aspects* has with a *Subject’s* internal factors.

Mathematical Effect of Innate Aspects.

- The *Immediate Benefit’s Innate Aspects* are multiplied by the *Perceived Immediate Value*.
- The *Immediate Benefit’s Innate Aspects* can increase, decrease, or have no effect on the *Perceived Immediate Value*

- As *Impulsiveness* increases, the *Immediate Benefit's Innate Aspects* should increase
- As *Impulsiveness* decreases, the *Immediate Benefit's Innate Aspects* should decrease

Figure 13: Immediate Benefit's Innate Aspect Circled

Three Benefits: Immediate Benefit

Immediate Benefit assesses a Consideration's short-term Benefits.

Figure 13. An image of the Immediate Benefit's Innate Aspects for the Benefits of the Consideration Titled "Buying a new guitar" circled in red.

Jenny's Decision: The Role of Innate Aspects.

Innate Aspects, as described in its definition, are caused by the *Subject's* internal factors, such as their mental capabilities and their dispositions. Since Jenny is a high-school-aged teenager, her mental capabilities are limited based on her brain's development^{Ref. 82} in ways that make her predisposed to have some *Impulsiveness*.

Having this predisposition towards *Impulsiveness* makes the *Innate Aspect* associated with the *Immediate Benefits* have an effect that increases the significance of the *Immediate Benefit's* value (more negative if the *Perceived Immediate Value* was negative and more positive if the *Perceived Immediate Value* was positive).

Jenny's predisposition towards having *Impulsiveness* made her give greater value to the *Immediate Benefits* (both positive and negative). The *Reward* of achievement, the *Ambiguity* of not knowing enough about new guitars, and the *Cost* of limited buying power have increased significance to Jenny due to her *Impulsiveness*. However, since Jenny had a negative *Perceived Immediate Value*, her predisposition in having *Impulsiveness* negatively affected the value of the *Immediate Benefit*.

Immediate Benefit's Trade History.

Trade History is a descriptor of past *Trades*, predominantly describing the recency and frequency of a *Consideration's* involvement in *Trades* and whether those *Trades* were a success (it was in an *Option* that was selected) or whether they were a failure (it was in an *Option* with a high *Option Focus* that was not selected). The SBST states that the *Immediate Benefit's Trade History* is a *Modifier* that is multiplied by the value derived from the *Perceived Immediate Value* multiplied by the *Immediate Benefits' Innate Aspects*; the same applies for the *Forecasted Benefits* and the *Cumulative Benefits* with their respective components.

A *Trade's* recency refers to how recently a *Trade* involving a *Consideration* was a success or how recently a *Trade* involving a *Consideration* failed.

A *Trade's* frequency refers to how frequently a *Trade* involving a *Consideration* was a success or how frequently a *Trade* involving a *Consideration* failed.

An example of a *Trade's* recency affecting a *Trade* would be the *Trade History* of the *Consideration Titled* "sugary sweetness" (a *Consideration* that a person is likely to use in the selection of *Options* regarding candy and deserts). A person may have heaps of sugary ice-cream and lose interest in it as they continue to eat. The person's lack of enthusiasm would be shared for eating sugary chocolates. Even though the (hypothetical) person has not eaten chocolate for quite some time. However, since the person recently had a past *Trade* which involved the *Consideration* of "sugary sweetness." In this contrived example, the past recent *Trade* of eating sugary ice-cream would lower the value of eating sugary chocolates in the near future. Although this example is contrived, and the person does not exist (as is common among thought experiments), the notion of a taste lowering in pungency is well recognized by the concept of [sensory adaptation](#)^{Ref. 42}.

The SBST, in its current form, does not explore the specifics of *Trade History*. Certain *Trade Histories* may work better for a particular *Consideration* while it may not work for others, as seen in [this article](#)^{Ref. 71} which notes the difference in times required to form a habit based on the varying in effort of the tasks. Regardless, the proposed relationship of *Trade History* to a *Consideration's Benefits* is still valid and is also recognized in the [RFM](#)^{Ref. 80}, a marketing tool which is used to predict a customer's behaviors.

Beyond the relationship, the SBST does not specifically state how recency and frequency affect the valuation of *Trade History*. For example, a high frequency may be habit-forming (and thus raise the value), or monotonously tedious (and thus lower the value). Instead, the SBST recognizes its importance in the decision-making process and its relationship to other components of the decision-making process. The SBST also does not make any distinction (in how the *Trade History* derives its value) between the *Trade History* used in *Immediate Benefits* to the *Trade History* used in *Forecasted Benefits* or *Cumulative Benefits* but recognizes their individuality.

Mathematical Effect of Trade History.

- Depending on the value derived from the (*Perceived Immediate Value* * *Immediate Benefit's Innate Aspects*) and the nature of the *Immediate Trade History*, it can either increase or decrease the value of a *Consideration's Immediate Benefits*.
- Although the exact effects of recency and frequency on the valuation of *Trade History* is vague (as a high value in either can increase or decrease the value of *Trade History*) affecting them will have an effect on the valuation of *Trade History*, and thus an effect on the *Immediate Benefits*.

Figure 14: Immediate Benefit's Trade History Circled

Three Benefits: Immediate Benefit

Immediate Benefit assesses a Consideration's short-term Benefits.

Figure 14. An image of the Immediate Benefit's Trade History for the Benefits of the Consideration Titled "Buying a new guitar" circled in red.

Jenny's Decision: The Role of Trade History.

The *Consideration* of "Buying a new guitar", is likely a *Consideration* that Jenny has been used frequently since she has been saving up for it for such a long time (as shown in the context). This high frequency of the *Consideration's* involvement in previously selected *Trades* would affect the *Trade History* she has associated with the *Consideration*.

The SBST, in its current state, does not describe how specific *Trade Histories* affect the value of *Trade History*. So, by the high frequency of success of this *Consideration*, Jenny may feel desensitized to the idea of saving up for the guitar (lowering the value of the *Trade History*, and lowering the significance of the *Immediate Benefits*) or she might have become habituated to

the idea of saving up for a guitar and grown pleasantly accustomed to doing it (increasing the value of the *Trade History*, and thus increasing the significance of the *Immediate Benefits*).

Since Jenny's dream is to become a famous guitarist, we can assume that she has become habituated to the idea of buying a new guitar, and thus increased the value of *Trade History*.

Also, the SBST makes no distinction for how the *Trade History of Immediate Benefits* is calculated as compared to the *Trade History of the Forecasted Benefits* or of the *Cumulative Benefits*; so, they would have the same reasons as the ones described here for how they derived their value; making all of them have the same value as each other.

Forecasted Benefits.

The *Forecasted Benefits* are *Benefits* received in the future. The *Forecasted Benefits* is comprised of 5 main components:

1. *Forecasted Ambiguity*
2. *Forecasted Rewards*
3. *Forecasted Costs*
4. *Innate Aspects*
5. *Trade History*

Another important value of *Forecasted Benefits* is the *Perceived Forecasted Value* which is equal to the *Forecasted Rewards* minus the *Forecasted Ambiguity* minus the *Forecasted Costs* ($\text{Perceived Forecasted Value} = \text{Forecasted Rewards} - \text{Forecasted Ambiguity} - \text{Forecasted Costs}$). This distinction is made for the user of the SBST to observe how the *Subject* evaluates the *Forecasted Benefits* of the directly anterior *Consideration* purely based on their *Opinions/Understanding* of it.

The *Perceived Forecasted Value* is multiplied by the *Innate Aspects* and *Trade History* resulting in the *Forecasted Benefit* ($\text{Forecasted Benefit} = \text{Perceived Forecasted Value} * \text{Innate Aspects} * \text{Trade History}$). This value includes their *Innate Aspects* and *Trade History* which are easily susceptible to change, as more *Trades* occur, time between *Trades* elapses, or the *Subject's Innate Aspects* are altered.

Each of these components are fundamental to the SBST, so any changes (by increasing or decreasing its value) can have significant effects on the selection of an *Option*. By increasing or decreasing any of these components it would affect the valuation of the *Forecasted Benefit*, which would affect the valuation of the *Three Benefits*, which would affect the valuation of the *Primary Consideration*, which would ultimately affect the valuation of the *Option*. For the sake of brevity, this mathematical significance will not be reiterated for each component in their mathematical effects.

Figure 15: Forecasted Benefits

Figure 15. An image of the Forecasted Benefit which is assessing the future Benefits of the Consideration Titled “Buying a new guitar”.

Forecasted Ambiguity.

A Consideration’s Forecasted Ambiguity is the same as the Immediate Benefits and is still derived from the Subject’s Opinions/Understanding. The only difference is that it is now assessing the Perceived Benefits received in the future (rather than the short-term Benefits).

Mathematical Effect of Forecasted Ambiguity.

- *Forecasted Ambiguity* may be lowered. This simulates a person satisfying their apprehension towards a Consideration, either by expanding their Opinions/Understanding to encompass that which they Perceived as being lacking or they come to the Perception that they do not lack Opinions/Understanding through some other means (like being convinced that they already have full awareness and do not lack Opinions/Understanding, or the process described in Immediate Ambiguity regarding interpolation and extrapolation).
- *Forecasted Ambiguity* is not rigid, it can both decrease and increase. A person’s Perceived lack of Opinions/Understanding is a state, a state which can be changed voluntarily (and thus trackable through the SBST) or involuntary (perhaps through a head injury). Recognizing the flexibility of Forecasted Ambiguity simulates the flexible nature of human Perceptions.
- *Forecasted Ambiguity* decreases the Perceived Forecasted Value of a Consideration. This is an assumption that a person who Perceives that they have lack of

Opinions/Understanding towards a *Consideration* will view this lack as negative and it will act to disincentivize them from selecting the *Consideration's* associated *Option*.

Figure 16: Forecasted Ambiguity Circled

Figure 16. An image of the Forecasted Ambiguity for the Benefits of the Consideration Titled “Buying a new guitar” circled in red.

Jenny’s Decision: The Role of Forecasted Ambiguity.

Since Jenny actually buying the guitar would take place in the future, that is where the majority of the positive and negative *Benefits* would be received. Also, it being the future, there is more possibilities and thus more room for unsurety.

Jenny may have lots of *Ambiguity* as she has a significant *Perceived* lack of *Opinions/Understanding*. She does not have an *Understanding* of the quality of the guitar that she will purchase. She does not have a clear *Understanding* for how long it will take her to practice before she becomes a skilled guitarist – or whether she would ever become a skilled guitarist. She does not have a clear *Understanding* for how often she will be able to play the guitar, or if her time would be taken up with school or some other activity.

The future is a place where clear *Understanding* is much rarer, as compared to the past and the *Immediate* sense. For Jenny, this *Perceived* lack of *Opinions/Understanding* regarding *Benefits* received in the future creates a high amount of *Forecasted Ambiguity*.

Forecasted Rewards.

A *Consideration's Forecasted Rewards* is the same as the *Immediate Benefits* and is still derived from the *Subject's Opinions/Understanding*. The only difference is that it is now assessing the *Perceived positive Benefits* received in the future.

Mathematical Effect of Forecasted Rewards.

- *Forecasted Rewards* increase the value of a *Consideration's Forecasted Benefits*.
- By changing a *Subject's Understanding* towards a *Consideration*, it can lower or increase the *Forecasted Rewards* of that *Consideration*
- By changing a *Subject's Opinion* towards a *Consideration* can lower or increase the *Forecasted Rewards* of that *Consideration*

Figure 17: Forecasted Rewards Circled

Three Benefits: Forecasted Benefit

Forecasted Benefit assesses a *Consideration's* future Benefits.

Figure 17. An image of the *Forecasted Rewards* for the *Benefits* of the *Consideration* Titled “Buying a new guitar” circled in red.

Jenny’s Decision: The Role of Forecasted Rewards.

For Jenny, buying a guitar has tremendous *Rewards*. Jenny would *Understand* that buying a guitar makes her part of a musical community and she would have a positive *Opinion* towards this *Understanding* (perhaps feeling comfort or a sense of belonging). Jenny would *Understand* that buying a guitar gives her access to the guitar to practice whenever she has the time to practice and she would have a positive *Opinion* towards this *Understanding* (perhaps feeling eager). Among positive *Benefits* received further in the future, Jenny would *Understand* that buying the guitar takes her closer to achieving her dream of becoming a famous guitarist and

would have a positive *Opinion* towards this *Understanding* (perhaps satisfaction and exhilaration). Even further in the future, would be the *Benefits* received from actually being a famous guitarist as she *Understands* that buying this guitar leads to her reaching that point. So, among all the previously stated positive *Benefits* would be the various *Understandings* Jenny has associated with being a famous guitarist (being loved by fans, meeting celebrities, going on tour, owning a seaside mansion, etc.) all of which she has positive *Opinion* towards.

For Jenny, buying a guitar leads to many *Rewards* from becoming part of the community to owning a seaside mansion as a result of her fame. All of this culminates in a *Forecasted Reward* that is very high.

Forecasted Costs.

A *Consideration's Forecasted Ambiguity* is the same as the *Immediate Benefits* and is still derived from the *Subject's Opinions/Understanding*. The only difference is that it is now assessing the *Perceived negative Benefits* received in the future.

Mathematical Effect of Forecasted Costs.

- *Forecasted Costs* decrease the value of a *Consideration's Forecasted Benefits*.
- Changing a *Subject's Understanding* towards a *Consideration* can lower or increase the *Forecasted Costs* of that *Consideration*
- Changing a *Subject's Opinion* towards a *Consideration* can lower or increase the *Forecasted Costs* of that *Consideration*

Figure 18: Forecasted Costs Circled

Figure 18. An image of the *Forecasted Costs* for the *Benefits* of the *Consideration* Titled “Buying a new guitar” circled in red.

Jenny’s Decision: The Role of Forecasted Costs.

Although Jenny has many *Forecasted Rewards* associated with buying a new guitar there are also many negatively *Perceived Benefits* that would be received in the future.

Of course, there would be the purchase of the new guitar which would drain her bank account substantially of funds which she would view negatively (perhaps with a sense of reluctance). There is also the time commitment of practicing, which could take up time that she would want to use for other things, she would view this *Understanding* negatively; perhaps with a sense of dismay. Then, as a famous guitarist, she has the *Understanding* that she would have to abandon her family and friends, to a degree, when she is on tour and with her celebrity friends and would have a negative *Attitude* towards this perhaps seeing this abandonment as immoral.

Jenny has grandiose ideas for her life as a famous guitarist, and perhaps her *Understandings* are not entirely grounded in reality but such is the nature of her *Perception* of this far-off dream. Her *Understanding* is her own (regardless of its accuracy) and from this *Understanding* and the *Opinions* she has towards them, Jenny recognizes (from her *Perception*) the many *Costs* that would come along with the *Rewards* she would receive in the future by buying herself a new guitar.

However, to Jenny these *Perceived Costs* and *Ambiguity* she has are outweighed by the marvelous *Rewards* she will receive in the future by buying a new guitar. This means that the *Perceived Forecasted Value* of the *Forecasted Benefits* of this *Consideration* is positive.

Innate Aspects: Prudence.

An *Innate Aspect* is described as the fluctuating inclinations of a person caused by their internal factors, such as a person's mental capabilities and their dispositions. *Innate Aspects* of the *Forecasted Benefit* differ from the *Immediate Benefits* and *Cumulative Benefits* in their most influential *Innate Aspect* involved in *Modifying* the valuation of their respective *Benefit*. The most influential *Innate Aspect* for *Forecasted Benefit* is *Prudence*.

Prudence is described as a person's inclination of being swayed by future gains and losses. If a person is currently feeling *Prudent*, then they would be more swayed by a *Consideration's Perceived Forecasted Rewards* than a person who is less *Prudent*. The *Innate Aspects* of *Forecasted Benefits*, (predominantly *Prudence*) is multiplied by the *Perceived Forecasted Value* to become a *Modifier* of the *Perceived Forecasted Value* (*Forecasted Benefit's Innate Aspects* * *Perceived Forecasted Value*). The *Forecasted Benefit's Innate Aspects* can either increase or decrease the value of a *Consideration's Forecasted Benefits*.

- This depends on how high or low a person's *Innate Aspects* of *Forecasted Benefits* are, though it is predominantly influenced by a person's *Prudence*, as well as whether the *Perceived Forecasted Value* is positive or negative.

The exact manner in which internal factors affect *Innate Aspects* (like *Prudence*) is not explained by the SBST. Rather the SBST simply acknowledges the relationship *Innate Aspects* has with a *Subject's* internal factors.

Mathematical Effect of Innate Aspects.

- The *Forecasted Benefit's Innate Aspects* are multiplied by the *Perceived Forecasted Value*.
- The *Forecasted Benefit's Innate Aspects* can increase, decrease, or have no effect on the *Perceived Forecasted Value*
- As *Prudence* increases, the *Forecasted Benefit's Innate Aspects* should increase
- As *Prudence* decreases, the *Forecasted Benefit's Innate Aspects* should decrease

Figure 19: Forecasted Benefit's Innate Aspects Circled

Figure 19. An image of the Forecasted Benefit's Innate Aspects for the Benefits of the Consideration Titled "Buying a new guitar" circled in red.

Jenny's Decision: The Role of Innate Aspects.

Jenny, in her dedication to her dream, has become quite *Prudent*. The *Benefits* received from becoming a famous guitarist and owning a new guitar are in the future; yet she values these *Benefits* highly.

Although Jenny is a teenager who is predisposed to *Impulsive* tendencies she is still capable of planning for the future and evaluating the positive and negative *Benefits* that can be found in the future by following a plan (even if that *Prudence* does not come as easily as her *Impulsiveness*).

From Jenny's drive, dedication, and foresight she has gained a relatively high level of *Prudence*. The *Reward* of celebrityhood, the *Ambiguity* of the quality of the guitar, and the *Cost* of using her money to buy the guitar (as well as all the other *Perceived Benefits* she will receive in the future and the *Perceived* lack of *Opinions/Understanding* she has towards *Benefits* she will receive in the future) have increased significance to Jenny due to her *Prudence*. Since Jenny had a positive *Perceived Forecasted Value*, her *Prudence* positively affected the value of the *Forecasted Benefit*.

Forecasted Benefit's Trade History.

Trade History is the same for all *Three Benefits*. Although their individuality is recognized, there is no difference (at present) in how *Trade History* is calculated for the different types of *Benefits*.

Mathematical Effect of Trade History.

- Depending on the value derived from the (*Perceived Forecasted Value* * *Forecasted Benefit's Innate Aspects*) and the nature of the *Forecasted Benefit's Trade History*, it can either increase or decrease the value of a *Consideration's Forecasted Benefits*.
- Although the exact effects of recency and frequency on the valuation of *Trade History* is vague (as a high value in either can increase or decrease the value of *Trade History*) affecting them will have an effect on the valuation of *Trade History*, and thus an effect on the *Forecasted Benefits*.

Figure 20: Forecasted Benefit's Trade History Circled

Three Benefits: Forecasted Benefit

Forecasted Benefit assesses a Consideration's future Benefits.

Figure 20. An image of the *Forecasted Benefit's Trade History* for the *Benefits* of the *Consideration Titled "Buying a new guitar"* circled in red.

Jenny's Decision: The Role of Trade History.

Since there is no difference in how the *Trade History* is calculated between the *Immediate*, *Forecasted*, and *Cumulative Benefits*, they would each have the same reasonings and explanation. Rather than repeating it here, the valuation of *Trade History* is explained in the *Immediate Benefits* and would have the same effect on the *Forecasted Benefits*.

The only difference is that the value of *Trade History* is being multiplied by the value derived from the *Perceived Forecasted Value* multiplied by the *Forecasted Benefit's Innate Aspects*.

Cumulative Benefits.

The *Cumulative Benefits* are *Benefits* that have been accumulated from the past. The *Cumulative Benefits* is comprised of 5 main components:

1. *Cumulative Ambiguity*
2. *Cumulative Rewards*
3. *Cumulative Costs*
4. *Innate Aspects*
5. *Trade History*

Another important value of *Immediate Benefits* is the *Perceived Cumulative Value* which is equal to the *Cumulative Rewards* minus the *Cumulative Ambiguity* minus the *Cumulative Costs* ($\text{Perceived Cumulative Value} = \text{Cumulative Rewards} - \text{Cumulative Ambiguity} - \text{Cumulative Costs}$). This distinction is made for the user of the SBST to observe how the *Subject* evaluates the *Cumulative Benefits* of the directly anterior *Consideration* purely based on their *Opinions/Understanding* of it.

The *Perceived Cumulative Value* is multiplied by the *Innate Aspects* and *Trade History* resulting in the *Cumulative Benefit* ($\text{Cumulative Benefit} = \text{Perceived Cumulative Value} * \text{Innate Aspects} * \text{Trade History}$). This value includes their *Innate Aspects* and *Trade History* which are easily susceptible to change, as more *Trades* occur, time between *Trades* elapses, or the *Subject's Innate Aspects* are altered.

Each of these components are fundamental to the SBST, so any changes (by increasing or decreasing its value) can have significant effects on the selection of an *Option*. By increasing or decreasing any of these components it would affect the valuation of the *Cumulative Benefit*, which would affect the valuation of the *Three Benefits*, which would affect the valuation of the *Primary Consideration*, which would ultimately affect the valuation of the *Option*. For the sake of brevity, this mathematical significance will not be reiterated for each component in their mathematical effects.

Figure 21: Cumulative Benefit

Three Benefits: Cumulative Benefit

Cumulative Benefit assesses a Consideration's accumulated Benefits.

Figure 21. An image of the *Cumulative Benefit*, which is assessing the accumulated Benefits of the Consideration Titled “Buying a new guitar”.

Cumulative Ambiguity.

A Consideration’s *Cumulative Ambiguity* is the same as the *Immediate Benefits* and is still derived from the Subject’s *Opinions/Understanding*. The only difference is that it is now assessing the accumulated *Benefits* of the Consideration (rather than the short-term *Benefits*).

It should be noted that a Subject may still have *Ambiguity* for *Benefits* received in the past (i.e. that have been accumulated). Even though they happened in the past, the *Benefits* received may be called into question. An example of this is shown in [this article](#)^{Ref. 53}, which goes on to ask whether salt is actually harmful to the human body. The *Perceived Benefits* (positive and negative) that salt provides to people is primarily relating to its flavor, and this article calls that into question. The article raises the possibility that other *Benefits* were also being received as the reader of this article was eating salt, thus creating *Ambiguity* for the *Benefits* received in the past from eating salt as well as foods that have the Consideration of “saltiness”.

Mathematical Effect of Cumulative Ambiguity.

- *Cumulative Ambiguity* may be lowered. This simulates a person satisfying their apprehension towards a Consideration, either by expanding their *Opinions/Understanding* to encompass that which they Perceived as being lacking or they come to the Perception that they do not lack *Opinions/Understanding* through some other means (like being convinced that they already have full awareness and do

- not lack *Opinions/Understanding*, or the process described in *Immediate Ambiguity* regarding interpolation and extrapolation).
- *Cumulative Ambiguity* is not rigid, it can both decrease and increase. A person's *Perceived* lack of *Opinions/Understanding* is a state, a state which can be changed voluntarily (and thus trackable through the SBST) or involuntary (perhaps through a head injury). Recognizing the flexibility of *Cumulative Ambiguity* simulates the flexible nature of human *Perceptions*.
 - *Cumulative Ambiguity* decreases the *Perceived Cumulative Value* of a *Consideration*. This is an assumption that a person who *Perceives* that they have a lack of *Opinions/Understanding* towards a *Consideration* will view this lack as negative and it will act to disincentivize them from selecting the *Consideration's* associated an *Option*.

Figure 22: Cumulative Ambiguity Circled

Three Benefits: Cumulative Benefit

Cumulative Benefit assesses a Consideration's accumulated Benefits.

Figure 22. An image of the Cumulative Ambiguity for the Benefits of the Consideration Titled "Buying a new guitar" circled in red.

Jenny's Decision: The Role of Cumulative Ambiguity.

Jenny would have little to be *Ambiguous* about, regarding *Benefits* from the past. Yet there may still be a *Perceived* lack of *Opinions/Understanding* about those who dissuaded her from her dream and told her their disconcerting thoughts about being a guitarist. While Jenny is quite resolute in her dream, she has a *Perceived* lack of *Opinions* towards this *Understanding*. She does not know how to feel about those who tried to dissuade her. Should she feel grateful for their attempts to help her? Should she feel irritated at their lack of faith in her to become a

famous guitarist? For Jenny, how she should feel is unclear. From this *Perceived* lack of *Opinions*, there is a *Perceived* lack of *Opinions/Understanding*.

Cumulative Rewards.

A *Consideration's* *Cumulative Rewards* is the same as the *Immediate Benefits* and is still derived from the *Subject's* *Opinions/Understanding*. The only difference is that it is now assessing *Perceived* positive *Benefits* received in the past.

Mathematical Effect of Cumulative Rewards.

- *Cumulative Rewards* increase the value of a *Consideration's* *Cumulative Benefits*.
- By changing a *Subject's* *Understanding* towards a *Consideration*, it can lower or increase the *Cumulative Rewards* of that *Consideration*
- By changing a *Subject's* *Opinion* towards a *Consideration* can lower or increase the *Cumulative Rewards* of that *Consideration*

Figure 23: Cumulative Rewards Circled

Three Benefits: Cumulative Benefit

Cumulative Benefit assesses a Consideration's accumulated Benefits.

Figure 23. An image of the *Cumulative Rewards* for the *Benefits* of the *Consideration* Titled “Buying a new guitar” circled in red.

Jenny's Decision: The Role of Cumulative Rewards.

Although she has not yet bought the guitar, it has still yielded positive *Benefits*. These positive *Benefits* come from the achievement she has felt in the past from saving up for the guitar (perhaps feeling a sense of satisfaction or pride towards this *Understanding*) and the positive thoughts she's had when thinking about what life will be like after she has bought the new guitar (perhaps feeling a sense of nostalgia and delight from this *Understanding*). Jenny may have also

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discussed her dream of being a famous guitarist with friends who encouraged her and joined in her excitement. She views these previously received *Benefits* as positive, and thus they are *Cumulative Rewards*.

Cumulative Costs.

A *Consideration's Cumulative Ambiguity* is the same as the *Immediate Benefits* and is still derived from the *Subject's Opinions/Understanding*. The only difference is that it is now assessing the *Perceived negative Benefits* received in the past.

Mathematical Effect of Cumulative Costs.

- *Cumulative Costs* decrease the value of a *Consideration's Cumulative Benefits*.
- Changing a *Subject's Understanding* towards a *Consideration* can lower or increase the *Cumulative Costs* of that *Consideration*
- Changing a *Subject's Opinion* towards a *Consideration* can lower or increase the *Cumulative Costs* of that *Consideration*

Figure 24: Cumulative Costs Circled

Three Benefits: Cumulative Benefit

Cumulative Benefit assesses a Consideration's accumulated Benefits.

Figure 24. An image of the *Cumulative Costs* for the *Benefits* of the *Consideration* Titled “Buying a new guitar” circled in red.

Jenny's Decision: The Role of Cumulative Costs.

While Jenny has had many *Cumulative Rewards* in discussing and thinking about buying a new guitar, there may have also been *Costs*. Her friends may have been encouraging but not everyone she shared her dream with had the same enthusiasm (as shown in the context at the beginning of the paper). Perhaps others tried to dissuade her and rebuked her for her lofty dream.

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Jenny may have also had thoughts that were negative about buying a new guitar, like how difficult it would be to learn the guitar and having to leave her friends and family behind when she goes on tours (as a famous guitarist). She views these previously received *Benefits* as negative, and thus they are *Cumulative Costs*.

However, to Jenny these *Perceived Costs* and *Ambiguity* she has are outweighed by the previously received *Rewards* regarding the purchase of a new guitar. This means that the *Perceived Cumulative Value* of the *Cumulative Benefits* of this *Consideration* is positive.

Innate Aspects: Sentimentality.

An *Innate Aspect* is described as the fluctuating inclinations of a person caused by their internal factors, such as a person's mental capabilities and their dispositions. *Innate Aspects* of the *Cumulative Benefit* differ from the *Immediate Benefits* and *Cumulative Benefits* in their most influential *Innate Aspect* involved in *Modifying* the valuation of their respective *Benefit*. The most influential *Innate Aspect* for *Cumulative Benefit* is *Sentimentality*.

Sentimentality is described as a person's inclination of being swayed by past gains and losses. If a person is currently feeling *Sentimental*, then they would be more swayed by a *Consideration's Perceived Cumulative Value* than a person who is less *Sentimental*. The *Innate Aspects* of *Cumulative Benefits*, (predominantly *Sentimentality*) is multiplied by the *Perceived Cumulative Value* to become a *Modifier* of the *Perceived Cumulative Value* (*Cumulative Benefit's Innate Aspects * Perceived Cumulative Value*). The *Cumulative Benefit's Innate Aspects* can either increase or decrease the value of a *Consideration's Cumulative Benefits*.

- This depends on how high or low a person's *Innate Aspects* of *Cumulative Benefits* are, though it is predominantly influenced by a person's *Sentimentality*, as well as whether the *Perceived Cumulative Value* is positive or negative.

The exact manner in which internal factors affect *Innate Aspects* (like *Sentimentality*) is not explained by the SBST. Rather the SBST simply acknowledges the relationship *Innate Aspects* has with a *Subject's* internal factors.

Mathematical Effect of Innate Aspects.

- The *Cumulative Benefit's Innate Aspects* are multiplied by the *Perceived Cumulative Value*.
- The *Cumulative Benefit's Innate Aspects* can increase, decrease, or have no effect on the *Perceived Cumulative Value*
- As *Sentimentality* increases, the *Cumulative Benefit's Innate Aspects* should increase
- As *Sentimentality* decreases, the *Cumulative Benefit's Innate Aspects* should decrease

Figure 25: Cumulative Benefit's Innate Aspects Circled

Three Benefits: Cumulative Benefit

Cumulative Benefit assesses a Consideration's accumulated Benefits.

Figure 25. An image of the *Cumulative Benefit's Innate Aspects* for the *Benefits* of the Consideration Titled “Buying a new guitar” circled in red.

Jenny's Decision: The Role of Innate Aspects.

Jenny is not a very *Sentimental* person. While being mentally capable of valuing the past, she does not have a disposition towards *Sentimentality*. Jenny is looking towards the future; not fixating on the past.

Although, Jenny has received *Benefits* in the past from buying a new guitar (like the pleasant thoughts of becoming a celebrity, being encouraged and dissuaded by her friends, and has some *Ambiguity* regarding how she should feel about those who attempted to dissuade her) she regards these *Benefits* with little importance.

As such, her *Cumulative Benefit's Innate Aspect* has a low value. Since her *Perceived Cumulative Value* is positive, Jenny's low amount of *Sentimentality* reduces the value of the *Cumulative Benefit*. However, the *Cumulative Benefits* would still have a vital role in the valuation of the *Three Benefits* when all three of the *Benefits'* value are added to one another to form the value of the *Three Benefits*. So, although her *Cumulative Benefits* are low, they still have significance.

Cumulative Benefit's Trade History.

Trade History is the same for all *Three Benefits*. Although their individuality is recognized, there is no difference (at present) in how *Trade History* is calculated for the different types of *Benefits*.

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Mathematical Effect of Trade History.

- Depending on the value derived from the (*Perceived Cumulative Value* * *Cumulative Benefit's Innate Aspects*) and the nature of the *Cumulative Benefit's Trade History*, it can either increase or decrease the value of a *Consideration's Cumulative Benefits*.
- Although the exact effects of recency and frequency on the valuation of *Trade History* is vague (as a high value in either can increase or decrease the value of *Trade History*) affecting them will have an effect on the valuation of *Trade History*, and thus an effect on the *Cumulative Benefits*.

Figure 26: Cumulative Benefit's Trade History Circled

Three Benefits: Cumulative Benefit

Cumulative Benefit assesses a Consideration's accumulated Benefits.

Figure 26. An image of the *Cumulative Benefit's Trade History* for the *Benefits* of the *Consideration Titled "Buying a new guitar"* circled in red.

Jenny's Decision: The Role of Trade History.

Since there is no difference in how the *Trade History* is calculated between the *Immediate*, *Forecasted*, and *Cumulative Benefits*, they would each have the same reasonings and explanation. Rather than repeating it here, the valuation of *Trade History* is explained in the *Immediate Benefits* and would have the same effect on the *Cumulative Benefits*.

The only difference is that the value of *Trade History* is being multiplied by the value derived from the *Perceived Cumulative Value* multiplied by the *Cumulative Benefit's Innate Aspects*.

Figure 27: The flow of value towards the Primary Considerations from their respective General Impressions.

Figure 27. An image (crudely) showing the value of *General Impressions* being passed into its anterior *Considerations* until reaching the *Primary Considerations*. Each *General Impressions* derives their value from the sum of the *Three Benefits*.

Disparity Between Perceived Option Benefits Upon Selection and Upon Receipt

As explained throughout the paper, the SBST relies on the *Subject's Understanding* of the world, rather than an omniscient comprehension. This means that what a *Subject Perceives* as being positively *Beneficial* may not be as positively *Beneficial* as they *Perceived* it to be. There may be a distinct disparity between the *Subject's Perceived Option Benefit* at the point of selection and how they *Perceived* the *Option* upon receipt of its *Benefits*. This disparity, when negative, is described as being *Cheated*. The notion of being *Cheated* does not require malicious intent from any other party; it may be due to the *Subject's* ignorance (or lack of omniscience) on the *Option*. An example of this occurring would be that, upon arrival to Kyle's house, Jenny realizes that Kyle's kids are hosting an unexpected slumber party so she has to babysit Kyle's kids as well as their friends (and, as stated in the beginning, Jenny does not like kids so she was *Cheated*).

The disparity may also be positive, i.e. the *Subject's Perceived Option Benefit* at the point of selection is lower than how they *Perceived* the *Option* upon receipt of its *Benefits*. This disparity when positive may be described as being *Astounded* (no single word seems to succinctly encapsulate the idea of positively receiving more than expected, as shown on this [forum](#) ^{Ref. 91}, so "being *Astounded*" seems suitable enough). An example of this occurring would be that after Jenny babysits for Kyle, and everything went as she expected, he decided to pay Jenny \$90 instead of the agreed upon \$50 (so, in this case, Jenny was *Astounded*).

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21 Strategies Implied by the SBST

By combining the knowledge shared in this paper thus far, strategies develop from the mathematical relationships of the elements of the SBST. Since the SBST is a systematic framework whose purpose is to describe human motivation, we can use these mathematical relationships to persuade a person to select a specific *Option* by increasing its *Perceived Option Benefit* relative to other *Options*. So far, 21 strategies implied by the SBST have been identified that achieve this goal.

It should be noted that the ethical and moral implications of each strategy is irrelevant to SBST; these are just valid strategies used in voluntary *Trades*.

Strategy 1: Remove Considerations or add Considerations

When contemplating a *Trade*, its *Considerations* are typically the largest contributor for an *Option's Benefit*. These *Considerations* may be features of a product, responsibilities associated with an *Option*, an (intangible) emotional gain, along with many more possible *Considerations*. By adding positive *Considerations* and removing negative *Considerations* (and doing the inverse for competing *Options*) you raise the relative *Benefit* an *Option*.

- This strategy is enacted by advertisements when they explain the [positive Benefits of their product and the pitfalls of their competitors](#)^{Ref. 19}.
- This strategy is used in debate when a person uses a [“strawman”](#)^{Ref. 10} against their opponent's argument. They misrepresent their opponent's argument by adding negative *Considerations* and removing the argument's positive *Considerations*.

Strategy 2: Remove Options or Provide Additional Options

When comparing *Options*, there is often an *Option* that far outweighs another. One way to combat this is to remove the *Option* altogether or provide other *Options*.

- Large companies may use the strategy of removing *Options* by restraining competition in their industry, through high [barriers-to-entry](#)^{Ref. 39} and [mergers](#)^{Ref. 63} (which reduces *Options* for consumers).
- Companies compete in the same industry by [producing Options](#)^{Ref. 38} that provide a competitive choice (through the new *Options' Considerations*) for the consumer.

Strategy 3: Provide Option Focus to Options or Remove Option Focus from Other Options

When comparing *Options*, there is often an *Option* that far outweighs another. One way to combat this is to increase *Option Focus* toward your proposed *Options* or draw *Option Focus* away from other *Options*.

- A person may use [reminders](#)^{Ref. 27} to ensure that their *Option Focus* retains high *Option Focus*.
- A company may use large promotion strategies, like buying ads at the Superbowl to dramatically raise *Option Focus* in a [wide audience](#)^{Ref. 23}.
- A company may use [humor](#)^{Ref. 95} in their ads so that people talk about their *Option* long after the advertisement stops playing.

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- A company may hide alternative *Options* so that their consumers don't even know about them.
- Advertisements also limit *Option Focus* do this by stating that you can purchase their products or [endure a worse state of existence](#)^{Ref. 6} and expresses these as two binary states. When, in actuality, there may be [several other products](#)^{Ref. 90} to choose from which may confer similar effects.

Strategy 4: (in an interpersonal Trade) Increase the Value of Your Appeal to character Or Decrease the Value of Other Options' Appeal to Character

When comparing a variety of *Options* (not shown here) with products that hardly seem differentiated, an entity's [character](#)^{Ref. 30} is immensely important in tipping a *Trade* towards their favor.

- In the car industry, we typically recognize a brand by the character it portrays rather than the inherent quality and differentiation of the car's components.
 - Subaru has created a character that *Evokes* [loving family values](#)^{Ref. 89}
 - Dodge has created a character that *Evokes* a [sense of freedom](#)^{Ref. 65}
- In a debate people with a shaky argument may choose to attack the character of their opponents with an insult or an [argumentum ad hominem](#)^{Ref. 96} to lower the overall *Trade* value of their opponent's argument.
- Brands can do [community service](#)^{Ref. 37} and [humanitarian work](#)^{Ref. 20} to increase their brand image
- Brands can also aim to [increase their brand's image](#)^{Ref. 43} or [put down a competitor's brand](#)^{Ref. 101} image to make competing *Options* less valuable, in a relative sense.
- Companies may use advertisements to [define the attributes of their character](#)^{Ref. 66} to consumers.

Strategy 5: Control an Option's Evoked Set of Primary Considerations

When contemplating a *Trade*, its *Considerations* are typically the largest contributor for an *Option's Benefit*. These *Considerations* may be features of a product, responsibilities associated with an *Option*, an (intangible) emotional gain, along with many more possible *Considerations*. By controlling what *Considerations* are *Evoked* when an *Option* is brought up, much less convincing is necessary to encourage a person to accept a *Trade*.

1. This strategy is enacted by marketers when they use [product positioning](#)^{Ref. 74} strategies to more thoroughly convey the *Benefits* of a product to their consumers.
2. This strategy is used in ads that are used to [inform consumers about the product](#)^{Ref. 67}, as they provide the relevant *Considerations* for their product and show how they perform well in those *Considerations*.

Strategy 6: Limit and Control an Option's Evoked Set of Meta-Considerations

When contemplating a *Trade*, its *Considerations* are typically the largest contributor for an *Option's Benefit*. These *Considerations* may be features of a product, responsibilities associated with an *Option*, an (intangible) emotional gain, along with many more possible *Considerations*. By adding positive *Considerations* and removing negative *Considerations* (and doing the inverse for competing *Options*) you raise the relative *Benefit* an *Option*.

- This strategy is commonly enacted by [deodorant advertisements](#)^{Ref. 5}, as they rarely provide any information about the *Benefits* of the product; thus reducing any *Meta-Considerations*. Instead, they rely on being able to persuade a person's *General Impressions* of the product through establishing a very high *Opinion* towards the little amount that the customer *Understands*.
- This strategy is used in [time restricted promotions](#)^{Ref. 103}, as the person does not have the time to think about the *Option* for long enough to create a thorough *Evoked Set of Meta-Considerations* and must act on their *General Impressions* of the product.

Strategy 7: Make someone believe that they have already accepted the Trade

When comparing *Options*, a person contemplates whether making a *Trade*. This *Trade* is comparing *Options* to determine what change of state they should make- if any. However, if they already believed that they made the *Trade* then a new *Trade* is not necessary. This strategy is quite popular with beliefs, as there is no tangible proof of previous beliefs.

- This strategy is enacted when marketers try to make the consumer think an *Understanding*, or *Opinion* originated from themselves; that the belief was ["their idea"](#)^{Ref. 35}.
- This strategy is used in debates where a person commits the fallacy of putting forward a ["complex question"](#)^{Ref. 9} which presupposes that part of the question has already been accepted.

Strategy 8: Lower Immediate Ambiguity

Typically, there is very little *Immediate Ambiguity* in a *Trade* due to the short-term nature of the *Benefit*. However, some companies use this to their advantage.

- In the gambling industry this strategy is used in the form of the ["near-miss"](#)^{Ref. 50}. If people believe that a *Benefit* is near, then it reduces *Ambiguity* of the *Trade*. [Slot machines](#)^{Ref. 2} are a great example of this strategy.
- A company may also create a sense of mystery around a product and surround the mystery with positive connotations and buzzwords in the hopes that the customer will satisfy their *"Perceived lack of Opinions and Understanding"* by coming to conclusions from their current *Opinion* and *Understanding* in ways that reduce *Immediate Ambiguity*. Starbucks' [elaborate coffee specials](#)^{Ref. 78} are an example of this strategy in practice, as they tend not to give much information about it but offer enough for the customer to fill in the rest.

Strategy 9: Lower Immediate Costs

When the *Immediate Costs* of a product are greater than its *Rewards*, then it will need compensate for this disparity. One method is to lower the product's *Costs*

- The most common way of doing this is to [lower the economic price of a product](#)^{Ref. 73}. That way the money paid for it is justified to the consumer.
- A new way that companies are reducing *Immediate Costs* is through reducing consumer responsibilities.
 - If a person wanted to get an item from a brick and mortar store, they would be responsible for driving to the store, walking around to find the item, paying for it, and then carrying it back to their house. Through [Amazon](#)^{Ref. 3}, these responsibilities are reduced. A person only needs to search for the item using their phone, tap one-click to pay, and wait for its arrival. This [subversion of typical industry practices](#)^{Ref. 44} is a strategy to lower *Immediate Costs*.

Strategy 10: Increase Immediate Rewards

When the *Immediate Costs* of a product are too high, a company can compensate by increasing the its *Immediate Rewards*.

3. In most industries, a company may choose to increase the quality of product to justify its *Costs*. Some examples of these techniques include the following:
 - A company may increase the *Perceived* quality of the [materials used in a product](#)^{Ref. 60}
 - A company may increase the quality of the [product's packaging](#)^{Ref. 25}
 - A company may try to give a higher *Immediate* return on a purchase by [letting you receive more for your purchase](#)^{Ref. 92}

Strategy 11: Increase or decrease Person's Impulsiveness

When the *Immediate Rewards* of a product outweigh its *Immediate Ambiguity* and *Immediate Costs*, the *Benefit* can be heightened by increasing a person's *Impulsiveness*.

- Several industries do this through emotively charged visuals.
 - Sexual impulses are commonly used by [deodorant commercials](#)^{Ref. 58} to make its consumers more *Impulsive*.
 - Many companies use [color psychology](#)^{Ref. 77} in their advertisements. An example of this is using the color red in an [advertisement](#)^{Ref. 36} to increase appetite and passion.
- Another example of this would be the usage of [emotionally charged audios](#)^{Ref. 81} to elicit an emotional response from potential customers. An example of this would be in [commercials for children's toys](#)^{Ref. 4}.

Strategy 12: Lower Forecasted Ambiguity

When contemplating the *Forecasted Benefit* of an *Option*, there may be a significant amount of *Ambiguity*, as a person cannot fully *Understand* the future (and a *Perceived* lack of *Understanding* increases). Companies can make an effort to lower the *Forecasted Ambiguity* to increase the value of a *Trade*.

- Provide a [warranty](#)^{Ref. 49}, to protect against possible future damages or changes
- Provide a [money back guarantee](#)^{Ref. 70}, to protect against a customer's potential product dissatisfaction
- Provide a description for the product's [intended outcome](#)^{Ref. 104}

Strategy 13: Lower Forecasted Costs

When the *Forecasted Costs* of a product are greater than its *Rewards*, then it will need to compensate for this disparity. One method is to lower the product's *Costs*

- One way is to alleviate any potential *Costs* associated with the product.
 - An example of this would be a dentist explaining the effects of a treatment through [pamphlets](#)^{Ref. 61} and [discussion](#)^{Ref. 52}. So that the patient's *Understanding* of the treatment's potential *Costs* (such as pain, future impacts, and monetary fees) are not affected by any negative misconceptions.
- Another way is to monetarily reduce a price or responsibilities for the product in the future. An example of this is [paying a loan early](#)^{Ref. 72}.

Strategy 14: Increase Forecasted Rewards

When the *Forecasted Costs* of a product are too high, a company can compensate by increasing the its *Forecasted Rewards*.

- Companies tend to emphasize the [durability and longevity of a product](#)^{Ref. 105}, which increases *Forecasted Rewards* of purchasing that product- as it lasts for a longer time period.
- Companies may state the future *Benefits* of their product to the customer and express it in a way that creates a [positive Opinion](#)^{Ref. 33} towards that new *Understanding*.
- Companies may describe the long-term *Benefits* of owning a product as an investment; that if they buy the product now, then they will receive a greater *Benefit* in the future. This occurs with antiques, stocks, and commodities that are [purchased for resale](#)^{Ref. 18}.

Strategy 15: Increase or Decrease Person's Prudence

When the *Immediate Rewards* of a product outweigh its *Immediate Ambiguity* and *Immediate Costs*, the *Benefit* can be heightened by increasing a person's *Prudence*.

- Several industries do this through emotively charged visuals.
 - Some companies use future danger, like potential danger to the [planet](#)^{Ref. 102}, potential dangers to your [family](#)^{Ref. 62}, and potential dangers to [yourself](#)^{Ref. 41} to increase a viewer's *Prudence*.

- Other companies use the future-centric concepts, like [scientific progress](#)^{Ref. 86} and [preparing a better world for children](#)^{Ref. 87} to shift a viewer's dispositions towards increased *Prudence*.

Strategy 16: Lower Cumulative Ambiguity

Typically, there is very little *Cumulative Ambiguity* in a *Trade* due to the fact that the *Trades* have already occurred. However, some companies use this to their advantage.

- A company may state that a person lacked a full *Opinions/Understanding* of the *Costs* and *Rewards* when they received them. Then by telling them the [“full story”](#)^{Ref. 59} a company can change how a person *Perceives* their *Cumulative Costs* and *Rewards*.
- A company may also create a sense of misconceptions around a product so that people can [re-evaluate](#)^{Ref. 84} their *Cumulative Costs* and *Rewards* and come to a new *Attitude* towards them.

Strategy 17: Lower Cumulative Costs

Since the *Cumulative Costs* have already occurred, a company can do very little to change that they have already happened.

- The most common way of doing this is to lower the *Cost* by changing the way people feel about those *Costs* (their *Opinions* of what they *Understand*), such as providing [compensation](#)^{Ref. 28} for those previous *Costs*.
- A company may [proactively](#)^{Ref. 64} attempt to limit potential future *Cumulative Costs* by providing a product or service that is reliably *Beneficial* and has low *Costs*.

Strategy 18: Increase Cumulative Rewards

Since the *Cumulative Rewards* have already occurred, a company can do very little to change that they have already happened.

- The most common way of doing this is to increase the *Cumulative Rewards* by changing the way people feel about those *Rewards*. An example of this is showing how difficult it was for the company to [provide those Rewards](#).^{Ref. 68}
- A company may attempt to increase potential future *Cumulative Rewards* by providing a product or service that is constantly provides *Rewards* to its customers. An example of this is a company's [Rewards program](#)^{Ref. 47}.
- A company may provide a [trial period](#)^{Ref. 1} to use their product, which increases the product's *Cumulative Rewards* before committing to a purchase.

Strategy 19: Increase or decrease Person's Sentimentality

When the *Cumulative Rewards* of a product outweigh its *Cumulative Ambiguity* and *Cumulative Costs*, the *Benefit* can be heightened by increasing a person's *Sentimentality*.

- Several industries do this through emotively charged visuals.
 - [Nature](#)^{Ref. 24}, [nostalgia](#)^{Ref. 79}, and [family](#)^{Ref. 31} are commonly used to make its consumers more *Sentimental*.

- Another example of this is found in advertisements that show the [longevity of people's loyalty to the brand](#)^{Ref. 29}.

Strategy 20: Control Trade History to improve all Benefits

Controlling a product's *Trade History*, mainly the recency and frequency of success and failure for previous *Trades*, can have a major impact on a *Trade's Benefits*.

- Having greater time between successful *Trades* (low recency of a successful *Trade*), can increase the value of the product by creating a sense of rarity. This can be seen with [seasonal food products](#)^{Ref. 88}.
- Having a high frequency of a successful *Trade* can increase the value of a *Trade* by making the *Trade* [habitual](#)^{Ref. 71}.

Strategy 21: Control Opinions/Understanding to modify all Benefits

Opinions/Understanding is the root cause of a *Consideration's Attitude*. Controlling a person's *Opinions/Understanding* affects the *Perceived Costs, Rewards, and Ambiguity* of all *Three Benefits*.

- This strategy is quite common for Marketers *Opinions/Understanding* can be shaped through a multitude of methods. Here are some examples of these methods:
 - A product can hold a specific place in a person's mind, which Marketers control through [product positioning](#)^{Ref. 45}.
 - A product's *Opinions/Understanding* can be shaped by endorsement from [celebrities](#)^{Ref. 26}.
 - A Subject's *Opinions/Understanding* for a Product can be informed by the [news](#)^{Ref. 17}.

Applications of the SBST

As a systematic framework that implies strategies to persuade a person to accept a *Trade*, the SBST has obvious applications for *Understanding* people's decisions and persuading people to make a decision. The SBST can likely be used in any general scenario where human motivation plays a role. However, this section will explore the less obvious applications of the SBST that can be used even in the SBST's current state (although it will be done in broad detail, as each application of the SBST could be its own paper).

Psychotherapy and Cognitive Behavioral Therapy

The goal of [cognitive behavioral therapy](#)^{Ref. 56} is to give the therapist a framework in which to recognize a patient's thoughts and see how these thoughts affect their feelings and behaviors. If the patient sees their thoughts, feelings, or behavior as problematic then the therapist sets goals for the patient to achieve that should change these problems and talks through the problems with the patient. Cognitive behavioral therapy has been shown in clinical trials to be highly successful in helping people who experience depression, phobias, anxiety, and many other similar experiences. When conducting this procedure, the therapist needs to tailor how they comprehend and react to thoughts and how they affect feelings and behaviors, for each patient.

When combined with the SBST, these problems of tailoring can be made much easier. The therapist, rather than relying on their professionally developed intuition to comprehend and This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

react to a patient's thoughts, can compare the person's thoughts against the strategies of the SBST. A patient's thoughts can be classified by their assumed impact as it relates to the 21 strategies implied by the SBST and then the therapist can set goals that counteract those strategies or lower those strategies' effects.

For example, a patient may be thinking that others find them physically unattractive and this may be stopping them performing public speaking (which they want to be more comfortable doing). The therapist can recognize that the thought of physical unattractiveness may be taking on strategy 1 (adding a *Consideration*). The *Consideration* that the patient has added in their assessment of the *Option*: public speaking is one that has a negative *Attitude* and is thus lowering the *Perceived Option Benefit*. From this, the therapist recognizes the effect of the thought and can question the patient further to recognize the extent of the *Consideration's* negativity; now they can counteract it by removing the *Consideration* (perhaps by providing evidence that the *Consideration* is baseless and irrelevant or giving them a goal which serves the same purpose) or they can use any of the other strategies to lower its effects (such as increasing the *Forecasted Rewards* of other *Considerations*, or adding other *Considerations* that have an equally positive *Attitude*). Using the SBST alongside traditional cognitive behavioral therapy practices gives therapists more structure in how they can react to a patient's thoughts to change their behaviors.

Product Sentiment Analysis

Having a good product is only part of the process in selling it. Marketers use the 4 P's (also called the [marketing mix](#) ^{Ref. 54}) to describe the variables that can be altered by companies to influence a customer's decision in purchasing their goods. The 4 P's are as follows: product, price, promotion, and place. By changing these variables, companies can influence customers to purchase their goods. However, these variables are broad and don't recognize the customers' unique desires. Since the SBST assesses an individual's motivations, it would be very useful to accompany the 4 P's with the SBST to remedy this issue.

The SBST can be used to look at an individual customer's motivations and see how they *Perceive* the distinct *Benefits* of your good. While the 4 P's would state that you should be thinking about your product in the broad sense, after using the SBST to analyze an individual you can recognize the specific aspects and features of your product that the individual customer likes and does not like. This process can be repeated and aggregated, so the company can recognize *Considerations* that are commonly positive and negative among their customers. By performing a full analysis of a customer through the lens of the SBST, specific actionable insights can be recognized.

An example for the product aspect of the 4 P's would be the *Considerations* a person has for the purchase of that *Option*. These *Considerations* may include its durability, materials, craftsmanship, size, weight, etc. and by looking at their associated *Attitude* the company can determine what is most desirable to the customer (the *Considerations* that have the highest *Attitude*), what is detested by the customer (the *Considerations* that have the lowest, negative *Attitude*), and what is unimportant to the customer (*Considerations* that have a negligible effect on the *Perceived Option Benefit*). The company can then allocate *Costs* where they would have the greatest impact on customers' *Considerations* - by ensuring that negative *Considerations* are This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

reduced, positive *Considerations* are maintained and emphasized, and unimportant *Considerations* only have enough to maintain themselves (if positive) or removed (if negative).

An example for the price aspect would be an American software company finding a pricing model for their software package and they were deciding whether to price it as a lump sum of \$60 or \$5 over sell it over the course of 12 months (as a subscription payment). Technically, the price of their good is the same. However, to the customer, it may seem very different. If, through surveys and questionnaires, they discovered that their customers tended to be very *Prudent* and hardly *Impulsive* then they would hold future *Benefits* in higher regard than short-term *Benefits*. To these customers, a subscription would be a *Forecasted Cost* that would be amplified by their *Prudence*. Therefore, a lump sum should be used, as it would likely be viewed as short-term *Cost* that is lowered by their low *Impulsiveness*.

An example for the promotion aspect of the 4 P's would be identifying the customers' *Option Focus* and *Opinions/Understanding* of the good. If the customer has a null value of *Option Focus* for the *Option* (likely that they've never heard of that good before) then there is no possibility of the customer purchasing that good. Marketers of that good should then find ways to increase *Option Focus* (such as tv advertisements and emails). If the customer has an *Opinions/Understanding* of the good's *Considerations* that is counter to what the marketers desire (perhaps from cultural, social, or media influences), then marketers of that good should find ways of changing the customers *Opinions/Understanding*. Marketers would have to find ways of encouraging their customers to voluntarily accept the change of state (from their previous *Opinions* and their previous *Understanding* to what the marketers desire) and they might do so with tactics listed in strategy 21 described in the section titled "21 Strategies Implied by the SBST".

An example of the place aspect would be in identifying the most suitable distribution channel. In a distribution channel the seemingly most important factors would be the effort used in acquiring the good, and the information that can be gleaned about the good. Online shoppers rely on standardization of quality among sold goods, so that reviews of the good and information offered are accurate for all sold goods. Physical shoppers can engage with the good and learn information about the good first-hand. In applying the SBST, physical shoppers are at an advantage in gleaning information about non-standardized goods (such as handcrafted items), and more *Considerations* may result from their direct contact with the good. These *Considerations* may have a positive or negative *Attitude*, but from that physical distribution channel they may have more *Considerations* that are accurate. Online shoppers would not be able to glean this information about a non-standardized good, and thus be *Cheated* upon receipt of the good. These *Cheated* online shoppers would likely react resentfully and have a negative impact on their *Considerations* and their *Opinions/Understanding* when purchasing that good in the future.

As shown above, through the examples given, the SBST can be used in conjunction with the commonly used 4 P's for marketers and companies to recognize their customer's sentiments towards their goods and thus improve the sales of their goods through specific actionable insights that are offered by the design of the SBST.

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Surveying for the SBST

The SBST can be filled out by a person plugging in their *Primary Considerations*, *Meta-Considerations*, *General Impressions*, and *Option Focus* for each *Option*. This can be a long process and requires specialized knowledge about the SBST. Although it is hoped that the SBST becomes widely known and useful to every single human being on the planet...that goal is a long way off; relying on people's knowledge of the SBST may not be feasible for many of the SBST's applications. However, the SBST can be turned into a fairly short survey of 5 questions.

1. "On a scale of 1-10 how much focus would you describe yourself having for each of the following *Options* [*Option 1*, *Option 2*, *Option 3*...]"
 - This would tell the researchers what the survey-taker's *Option Focus* is for each of the *Options*.
2. "Which of those *Options* would you select?"
 - This tells the researchers which *Option* has the highest *Perceived Option Benefit*.
3. "For the selected *Option*, what were the factors that influenced your decision?"
 - This question tells the researchers the *Primary Considerations* of the selected *Option*.
 - Instead of the survey-taker's selected *Option*, the researchers may decide to ask about a specific *Option* and this would require a very minor change to the wording of the question.
4. "How would you describe your *Attitude* towards each of those factors on a scale of -5 to +5?"
 - This tells the researchers what the *Attitude* of the *Primary Considerations* are, and whether they are positive or negative.
5. "In a short paragraph, explain why these factors were important to you and what made that factor have a positive or negative *Attitude* for you."
 - This tells the researchers about the *Meta-Considerations* of the *Primary Considerations* and their *Attitude* for each of them.
 - The *Attitude* of the *Meta-Considerations* can be gleaned from the tone of the survey-taker's language as well as the second part of the question.

These 5 questions should be enough for researchers to get the necessary information to fill out the SBST for one *Option*, with minor modifications depending on the topic and the survey-taker. If the researchers would like to analyze more than one *Option*, the survey's questions 3-5 can be repeated for each of the *Options* proposed in question 1.

However, this survey is not infallible. This survey is a type of [psychological introspection](#) ^{Ref. 22} that requires people to be comprehensive and truthful in their self-observations. As such, it has the same faults as introspection. An example of this fault can be observed by a person eating at a restaurant.

While there are certain aspects of a restaurant that are very noticeable, like its theme and décor, some aspects which contribute to the restaurant experience may go unnoticed. Obviously eating on a clean table is a factor in the restaurant experience but in American restaurants it has become ubiquitous to the point of imperceptibility. It is an expectation that people have of restaurants, and while they hardly notice its presence, they tend to notice its absence. In a survey, This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

the survey-taker may not report this unnoticed (yet important) factor, as well as many others like it. However, for many of the SBST's applications (like the product sentiment analysis described previously) true exactness and thorough comprehensiveness are not necessary for it to still be useful.

Story Writing and Character Development

While Jenny may not be the most compelling character in literature, it is easy to see her motivations and the reasons for her actions. For writers, this is no easy feat. Writers must keep track of the backstory and knowledge gained by a character throughout a story to ensure internal consistency of a character's motivations. The SBST makes this tremendously easier to track by having the entirety of a character's motivations for performing an action described within the SBST.

Character development in writing is also easy to incorporate into the SBST. A character performing different actions than what they would have done at the beginning of the story is a simple matter of strategies being acted upon the character to increase the *Perceived Option Benefit* of that *Option*, relative to other *Options*. A character changing their moral stance on another faction's ideology is due to a change of the character's *Opinions*. A character realizing that the world as they knew it was a lie and deciding to take action comes from a change of the character's *Understanding*. A character realizing that they have a magical power that they can use to overcome their problem is just an increase in *Option Focus* for the *Option* of using their powers (from a null value, when they weren't aware of it, to a positive value, when they became directly aware of their powers).

Monitoring the changes of state that the character goes through and tracking it in the SBST makes it significantly easier to ensure that each character has a justifiable motivation for their actions and that their motivations are consistent with what they have experienced. Although, the paragraphs above seem to make the motivations of a character seem simple and that's because through the lens of the SBST...they are. However, the writer still has the task of conveying these changes of state to the reader, developing the initial character that they apply to the SBST, and setting up scenarios that incite these changes of state for their characters. The SBST doesn't take away the excitement or skill in writing a story, but it makes writing and tracking a character's motivations much easier.

Human-like Artificial Intelligence

Human-like artificial intelligence has been a goal for humans since time [in memoriam](#) ^{Ref.}
⁵¹. Humans have desired to recreate themselves by their own comprehension of themselves and have continued to try to satisfy this desire be that by chatbots, chess players, and self-driving cars. Although closer than ever, the goal still seems to be so far away. The SBST can be used to take a gigantic leap towards achieving human-like artificial intelligence.

The SBST, as stated in the beginning, is a systematic framework whose purpose is to describe human motivations. The SBST does this through the mathematical relationships between its elements. The key word there is mathematical. The SBST offers a mathematical approach to human motivation whereby changes in their motivation is merely the changing of

numbers. While humans might have trouble keeping up with all those numbers when using the SBST, computers are highly skilled at mathematics. By plugging in the SBST into a computer through programming we might have a human-like artificial intelligence.

Many of the key aspects of programmed artificial intelligence is already integrated into the design of the SBST. The *Cumulative Benefits* aspect of the SBST is similar to the [reinforcement learning](#)^{Ref. 7} that is used by neural networks whereby past positive *Rewards* and past *Costs* affect future behavior. The *Forecasted Benefits* of the SBST is similar to the [long-term planning](#)^{Ref. 16} required for achieving tasks whose *Rewards* would only be received in the future. The *Immediate Benefits* of the SBST would ensure that the actions taken at every step are positively *Beneficial*, rather than being completely willing to negatively *Benefit* itself in service for a future goal, it would place some priority on the short-term as well (the extent being determined by its *Impulsiveness*). The *Trade History* would also prevent an AI from doing the same action repeatedly to gain a positive *Benefit*, as this would probably decrease the value of *Trade History* which decreases the value of the entire *Option* (making it likely that another *Option* would become comparatively more *Beneficial* which would make the AI select that other, more *Beneficial*, *Option* rather than repeat the same one).

The SBST's *Option Focus* would also help tremendously in computation efficiency, rather than going through every single *Option* that the AI could physically (or virtually) perform, it could ignore the *Options* with a null value of *Option Focus*, as these could not be selected. An example of this would be the task of lifting a pen off the floor (imagining a person who has determined that desiring that the pen be lifted off the floor is a positively *Beneficial* desire that they have selected to adopt). There are several (more granular) *Options* that the person could take to satisfy their newfound desire: a person could pick it up with their hands, they could pick it up with their teeth, they could ask another person to pick it up but to do so would require convincing that person (and there are a near-infinite of ways to convince a person to do lift the pen, by changing tone of voice, the words used, the accent used, etc. which grow exponentially with every potential person that they could convince). However, most people (when asked to pick up a pen) are not aware in the slightest that they could pick it up with their teeth or that they could convince a stranger to lift up the pen for them while using a fake Irish accent. Since these *Options* cannot be chosen (as they have a null *Option Focus*) even though the person may be physically capable of doing it; so, the *Options' Perceived Option Benefit* does not need to be calculated.

Safety of the SBST's Human-like AI

The SBST may also circumvent many of the AI [safety concerns](#)^{Ref. 83} by its design. The greatest way that it circumvents these concerns, is that an AI developed using the SBST does not have a specified objective besides selecting changes of state that it *Perceives* are the most *Beneficial* (thus stopping many methods of *Reward* hacking).

Humans have a vast network of [nerves](#)^{Ref. 32} that provide feedback for their actions which could help shape their *Rewards* and *Costs*. For example, a toddler sees a red stovetop with their ocular nerves, they get closer to the red stovetop and it sets their thermoreceptors in action, then they touch the red stovetop and they experience immense pain from their nociceptors. What they

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Understand mainly comes from their nerves, and how they feel about what they *Understand* also tends to come from their nerves. All this to say that if the human-like AI which was developed using the SBST had a consistent and constant source of feedback that would tell it about the world and its *Benefits*, it may be significantly safer and require little oversight as it can identify *Costs* and *Rewards* independent of any human intervention. It would also gain its *Understanding* in a similar manner to humans, making it easier to comprehend its behaviors.

The human-like AI would avoid negative side effects, if it knew that an action would have a *Cost*. Building the human-like AI in a way that humans are able to express to the human-like AI that certain actions should be deemed as *Costly* would be critical, to ensure that what the human-like AI viewed as *Costly* and what humans think are *Costly* align. So long as the 21 strategies are still performable on the human-like AI and humans knew how to use these strategies on the human-like AI, then humans should be able to convince the human-like AI not to select *Options* that the humans deemed negatively *Beneficial* (this also means that humans could convince the human-like AI to select *Options* that would be deemed negatively *Beneficial* by some humans, but this is no different than what happens to humans when they are incited to [commit crimes](#)^{Ref. 76} by others).

The human-like AI would also be encouraged to [safely explore](#)^{Ref. 75} by design. It would view *Ambiguity* as negative, being disincentivized to get into situations where it has a *Perceived* lack of *Opinions/Understanding*. Also, it would avoid *Options* that it viewed as *Costly*. However, this *Ambiguity* and *Cost* is negated if its associated *Rewards* (based on its *Opinions/Understanding*) is greater than the *Costs* and *Ambiguity*. Though, even if the *Rewards* it *Perceived* were greater than the *Costs* and *Ambiguity*, it would not select an *Option* until that *Option* had the highest *Perceived Option Benefit* among competing *Options*. This means it would avoid taking any *Option* it *Perceived* as being unclear until it had sufficient reasons to believe that it would be more positively *Beneficial* than any other *Option*. It would also be encouraged to explore through the element of *Trade History*, as a *Consideration* that is frequently used in previously selected *Options* may decrease the value of that *Consideration*, and thus its associated *Option*, which would encourage the human-like AI to explore other *Options* that do not have the frequently used *Consideration*. Although, how specific *Trade Histories* affect *Benefits* has not been fully explained by the SBST, but this imprecision may be remedied in the future with future developments on the SBST.

The human-like AI would be as robust to distributional change as only other human, it would not know how to deal with a new scenario without *Opinions/Understanding* of it (which might be gained through instruction, experience, or some other mechanism of epistemology) but if it *Perceived* that it lacked *Opinions/Understanding* (it had *Ambiguity*) then it would be disincentivized to engage with it. An AI that is developed using the SBST is likely to be more human-like and may be more safe than traditional AI.

However, there are still some problems that the programmer would have to face. These mainly include three problems. The first being *Evocation*. What possible source of *Evocation* would they choose to use? The second being *Understanding*. How would an AI have beliefs about the properties of their surroundings and the consequences of their actions? Thirdly being *Understanding*. This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Opinions. How would an AI have feelings about what they *Understand*, and how would it have emotional and moral associations?

The best candidate, that I am aware of, in solving many of these problems would be [DeepMind's imaginative AI](#)^{Ref. 69}. This AI has an internal model that allows the AI to recognize the properties of the world and the consequences of their actions (satisfying the issue of *Understanding*). It has an incentive structure that provides *Rewards* for performing specific actions or achieving certain goals – giving the AI rudimentary feelings that relate to its *Understanding* (*Opinions*). It does not seem to use a method for *Evocation* but using any of the possible sources of *Evocation* discussed earlier or tailoring an *Evocation* method suited for its task may be enough. Also, the *Considerations* used by Jenny in the example all seem to relate to states (i.e. past states, current states, and consequential states) that are relevant to the *Option*. While there are likely other *Considerations* that do not relate to relevant states (as the definition of *Considerations* is broad enough to encompass more than states) it would be fairly easy for a programmer to determine states that are relevant to an *Option* and get the value of these states to describe *Considerations*. Although it should be mentioned that I am not an expert in the field of machine learning, so my explanation may not accurately describe the mechanisms and intent of DeepMind's software or the ease of programming such a human-like AI.

Also, this human-like AI developed through the SBST likely could not pass the [Turing Test](#)^{Ref. 94} at its inception or... perhaps ever. Learning to speak English is not a necessity for an AI that is built with the SBST. It would be more like a toddler; stumbling around; attempting to find out which things are positively *Beneficial*, and which are negatively *Beneficial*. The AI might learn to speak if pattern recognition was *Rewarded* in the program (making it positively *Beneficial*), and accurate pattern recognition was *Rewarded* by a source that was already aware of the pattern (like a parent smiling and giving praise to a toddler for learning a new word). Although much of this is hopeful thinking, I believe that the SBST can have a tremendous impact on AI research in the quest of creating a human-like AI.

There are many more applications for the SBST some of which I already know (such as its application in contracting to ensure that neither party is *Cheated*) and others that I could hardly imagine. Even in the applications above, there is a lot more exploring to be done with these ideas and each could be the topic of its own paper. At this point I hope that the explanations of the previous sections and the applications presented here have inspired ways that you (the reader) can utilize the SBST and proven the SBST's comprehensiveness and usefulness.

SBST and Involuntary Trades

The SBST covers all voluntary *Trades*, where a person can actively choose between potential *Trades* (*Options*). However not all *Trades* are voluntary, as comprehensive as it is, the SBST does not cover these involuntary *Trades*.

An example of an involuntary *Trade* would be, hypothetically, if Jenny decided to drive to Kyle's house and was crashed into by another driver. This would be a change of state (the bruising, the damage to her car, the fear surging through her) and it would not be *Perceived* to be a positively *Beneficial* one. If given the chance to choose another *Option*, other than getting

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crashed into, she likely would. However, the *Trade* was not voluntary (she didn't select the *Option*) it was an involuntary *Trade*. The SBST is not able to explain this or any other involuntary *Trade*.

Another example of an involuntary *Trade* would be instinctively flinching, such as a knee jerk reaction. There seems to be no selection of an *Option* going on, in many cases the reaction occurs before even traveling to the brain (and is instead mediated by nerves in the spinal column as a [spinal reflex](#)^{Ref. 85}). These instinctive reactions are viewed as involuntary changes of state (*Trades*) and are thus not explained by the SBST.

Limitations of the SBST

As stated in the introduction, the SBST is still in its preliminary stages and thus some limitations are to be expected however there are also limitations that are an effect of the design of the SBST. This section will explore these limitations.

1. The SBST is not useful for describing involuntary *Trades*, such as knee jerk reactions.
2. The SBST does not adequately explain how an *Evoked Set of Meta-Considerations* or how an *Evoked Set of Primary Considerations* is created for *Options*. In its current state, the *Evoked Set of Considerations* (both *Primary* and *Meta*) can only be inferred based on the *Option* and assumptions based on the *Subject*.
3. The SBST uses arbitrary numbers to describe ordinal relationships between variables. While this is a useful representation to view the increases and decreases of variables and how they relate to one another, it does not allow mathematical functions to be applied to the system without a standardization of what the specific numbers represent.
4. The SBST uses generalizations to describe many of its terms, such as: “*Innate Aspects*”, “*Trade History*”, and “*Ambiguity*”. Similarly, it does not adequately distinguish the temporal difference between *Immediate Benefits* and *Forecasted Benefits*. More specificity is necessary to apply a truly mathematical approach to the system.
5. The static pictorial representation of the SBST used in this paper is limited in how much information it can convey to a user of the SBST.

Further Research

There is much work to be done in the development of the SBST. I have attempted to be as thorough as possible with the explanations and examples provided, although I realize that people with specialized expertise may be able to offer a great deal to the SBST and fill in any gaps that I may have overlooked or neglected to explain. Further research can be done in its explanation, its comparison to past ideas related to the SBST, and the many applications of the SBST. Here are some of the avenues of research that I would suggest to those who are capable and willing to advance the SBST.

1. Further research should be done in analyzing the temporal difference between *Immediate Benefits* and *Forecasted Benefits*. In the SBST, it refers to the *Immediate* as a short time period from the present, while *Forecasted* relates to the future, determining at which point a *Benefit* changes from *Immediate* to *Forecasted* is vital in the usage of the SBST.

Perhaps a general period of time could be used to distinguish the two *Benefits*, or a more individualistic view which takes into account the subjective conception of time.

2. Further research should be done to examine the SBST's *General Impressions* (and its substitute, the *Three Benefits*) against findings in the field of neuroscience. As described earlier in this paper, a person's biology is likely the source of how they determine a *Consideration's Benefits*.
3. Further research should be done to establish when a person actually compares *Options* on the *Option Comparison Table*. Would it be continuous process? Or would it require an involuntary *Trade* (a stimulus of sorts, like asking a person a question) to encourage someone to compare *Options*?
4. Further research should be done to analyze the effects of previous *Option* selection on future *Option* selections.
 - a. To expand on this point, if an *Option* is selected but not performed (i.e. the change of state does not occur) what happens?
 - b. Perhaps if a previously selected *Option* (e.g. driving to the mall) is unfulfilled then future *Options* (e.g. finding your keys) would have the satisfaction of this unfulfilled *Option* as part of their *Considerations*.
 - c. This possibility might be validated through *Evocation* techniques. The *Consideration* of satisfying an unfulfilled previously selected *Options* would be treated as any other *Consideration* and would have to be *Evoked*.
5. Further research should be done to examine the effectiveness of the SBST in context of [Game Theory](#)^{Ref. 40}, that is using your comprehension of a person to simulate their decision through the SBST to better plan your actions. This should help in the development of more specific *Evocation* techniques, as better techniques are found that accurately represent the other person's *Evoked Considerations*.
6. Further research is needed to express the specific nature of the terms described by the SBST, one of which is *Trade History*. While the relationship between *Trade History* and the *Benefits* seems accurate (as a *Modifier*) the finer details of how particular *Trade Histories* can differ in the way they *Modify* the *Benefits* of a *Consideration* has not been fully explored.
7. Further research should be done to recognize what types of *Considerations* a person may have. The *Considerations* in this paper are mostly all a recognition of states: past states, current states (e.g. current supply of money), and consequential states (e.g. get to sleep early). These all neatly fit within the current definition of *Considerations* due to its breadth. However, if these are the only kind of *Considerations* that a person may have, then it should be acknowledged in the definition of *Considerations*.
8. Finally, I would urge people to research ways to utilize the SBST. Do you want to write a self-help book on how the SBST can help people's marriages by recognizing each other's motivations? Go for it. Do you want to write a blog about how people can use the 21 strategies to close a deal with absolutely anyone? Sure, keep it legal, but you can do that. Do you want to develop the first human-like AI and make billions? Go do it. The SBST is being released under a Creative Commons Attribution 4.0 International License that

allows you to do almost anything you want with the SBST and keep the profits. I wanted the SBST to be a useful tool for as many people as possible, so go find ways to use it!

Conclusion

The SBST expresses human motivation in a systematic framework whose elements can be analyzed and manipulated for various purposes, from developing artificial intelligence to marketing a product. Human motivation plays a role in nearly all aspects of society...and wherever human motivation plays a role, the SBST can be used to better analyze it or manipulate it. Even in the SBST's current state, its usefulness extends to all people regardless of their occupation, age, or origins.

It should be acknowledged that the SBST is still in a preliminary state. There is still a lot more to learn about how each element works and the various factors that can influence them. Applying the rigor of traditional methods of study, like the scientific method, will hopefully make these elements and their relationships clearer and thus more useful.

It is with great hope that I offer the SBST to the academic and the non-academic community alike. I hope that they will recognize its merits as being valid, from the numerous examples and extensive explanations, and as being useful, from the many applications provided in this paper and implied by the design of the SBST. I look forward to seeing people use the SBST in their lives and the advancements that will be made in the SBST; taking the SBST from its current preliminary state to its final state.

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