How to cite:
Valero, D., Camiña, G., Coello, P. & Moreno, M. (2023) The future of psychographic profiling: the behavioral investor types case. *Behanomics, 1,* 121-141. DOI: https://doi.org/XXXX

Behanomics
Year 2023
Volume 1

EDITORIAL SECTION / SECCIÓN EDITORIAL CRITERIO PROPIO

The future of psychographic profiling: the behavioral investor types case. El futuro de los perfilados psicográficos: el caso de los behavioral investor types.

Diego Valero [a, b], Gonzalo Camiña [c], Pablo Coello [c, d], Manuel Moreno [a, e]

[a] Novaster.
[b] Evidentia University.
[c] Beway.
[d] Departamento de Fundamentos del Análisis Económico de la Universidad de Santiago de Compostela.
[e] Universidad Carlos III de Madrid.
Contact email: mmoreno@novaster.net

ABSTRACT
The current need for an accurate and personalized analysis of clients' interests has put psychographic profiling in the spotlight. Investor profiling allows investment plans to be designed according to the different psychological characteristics of the investor. This research aims both, firstly, to discuss the most relevant types of existing profiling and, secondly, to highlight the importance of the data collection process and to raise the shortcomings of the profiling process today. This data collection process is crucial for the interpretation and subsequent categorization of clients in the psychographic profiling model. This is an applied, explanatory and mostly qualitative research that adds the identification of possible errors in the profiling results obtained, caused by the application of standardized multiple-choice tests. Multiple-choice tests can incite satisficing behaviors that ultimately lead to poor psychographic profiling. The introduction of gamification and modern data quality analysis techniques (with indices to measure consistency and bogus items to discard unsatisfactory answers) into the process would mitigate satisficing behaviors and thus lead to more accurate data collection resulting in better profiling and higher satisfaction.

RESUMEN
La necesidad en la actualidad de análisis precisos y personalizados a los intereses de los clientes ha puesto los perfilados psicográficos en el centro de atención. Los perfilados de los inversores permiten diseñar planes de inversión acordes a las diferentes características psicológicas del inversor. Esta investigación tiene como objetivo tanto, en un primer lugar, tratar los tipos más relevantes de perfilados existentes como, en un segundo lugar, resaltar la importancia de la recogida de los datos del perfilado y analizar las deficiencias que hoy en día tiene este proceso. El proceso de recogida de datos es esencial para la interpretación y posterior categorización de los clientes en los perfilados psicográficos del modelo. La presente es una investigación aplicada, explicativa y mayormente cualitativa que añade la identificación de los posibles errores en los resultados de perfilados obtenidos, provocados por la aplicación de test estandarizados de respuesta múltiple. Los test de respuesta múltiple pueden incitar comportamientos de satisficing que, en último término, provoquen un mal perfilado psicográfico. La introducción de la gamificación y de técnicas de análisis de la calidad de datos modernas (con índices que midan la consistencia y preguntas de control que permitan descartar respuestas no satisfactorias) en el proceso permitirían mitigar los comportamientos de satisficing y, por tanto, una recogida de datos más certera que derivaría en un mejor perfilado y una mayor satisfacción.

PAPER HISTORY
Received: 07-02-2022
Accepted: 25-03-2022

KEYWORDS
Economics
Investment
Wealth
Behavior
Gamification
Data
Management

PALABRAS CLAVE
Economía
Inversión
Patrimonio
Comportamiento
Gamificación
Datos
Gestión

1. Brief notes on behavioral finance

Behavioral finance approaches investment processes from the perspective of investors' behavior, demonstrating that individuals don't act in a perfectly rational way, as postulated by classical theories: Modern Portfolio Theory (Markowitz, 1952), Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965; and Mossin, 1966) and the Efficient Markets Hypothesis (Fama, 1970), but perceive and feel reality depending on their cognitive and emotional capacities, acting accordingly1.

The behavioral approach relies heavily on investor psychology, which requires going deeper into areas of knowledge that are beyond the classical view, making the investment analysis process much more complex, but more enriching.

When creating investment portfolios, it is common to establish profiling procedures, which traditionally classify them into three large groups2, based exclusively on the degree of risk aversion of the individual. These groups define the investor as conservative, moderate, or aggressive, depending on their level of risk aversion. This means that, by considering an investor as, for example, conservative, we interpret that he will be risk averse always in all his investments. Reality contradicts this since our aversion to risk depends on different factors such as: what we invest for, with what time horizon, and the personal moment in which we find ourselves (reactions are not the same in periods of stability or stress, of satisfaction or disappointment, of joy or anger, for example).

Moreover, risk aversion is usually measured using superficial and repetitive tests that are very sensitive and can be easily conditioned3. It has been demonstrated that the intervention of a third party or the previous academic preparation of the interviewee can have a significant influence on his or her answers4.

It is generally accepted that the decision-making process is based on certain beliefs and how preferences are formed.

Therefore, behavioral finance broadens the range of variables to be considered, incorporating psychological variables that inflauence decision-making. They consider that both beliefs and preferences are psychologically

[1] For a succinct explanation of the behavioral versus classical bases, see Fundación Mutualidad Abogacía (2020). *El envejecimiento como riesgo empresarial.* Wolters Kluver
[2] In some cases, more groups have been considered, but all constructed in the same way.
[3] And in fact, conditions, in unpublished experiments conducted by the author, it is found that there is a high correlation between the profile of the manager who asks and that of the investor who answers
[4] Questions such as "Are you willing to take a 20% loss on your investment?" are not answered in the same way if the investor has previously received information on the long-term performance of the equity markets as if he has not received it.

conditioned. On the one hand, beliefs are affected by cognitive and emotional biases, and preferences are not formed following the Expected Utility Theory (Von Neumann & Morgensten, 1944) but as predicted by the Prospect Theory (Kahneman & Tversky, 1979). Behavioral biases can be cognitive or emotional. The difference between cognitive biases and the emotional errors we suffer from is quite subtle. But this framework can help us not only identify behavioral biases (cognitive biases and emotional errors) but also help us understand how we can correct them.

If we understand that the process of making a decision occurs on a spectrum ranging from completely rational to purely emotional, cognitive errors or biases are errors that arise due to our cognitive limitation (lack of information processing capacity, memory errors, statistical calculation capacity errors...) that cause us to deviate from the decisions that mark traditional finance. Emotional errors, on the other hand, arise spontaneously due to our opinions and feelings, and can cause us to deviate from traditional financial decisions.

Cognitive errors are easier to correct than emotional ones. Humans are better at modifying a habit if the origin of the erroneous habit can be identified in a logical manner.

Cognitive errors can be separated into two major groups: i) Belief Perseverance Biases: These are biases that have to do with the tendency to maintain our beliefs, however irrational they may be, and ii) Processing Errors, which describe how the information we receive is processed erroneously or used in an illogical way.

This article aims to introduce the behavioral investor concept and go deeper into some of the principal models, principally the Behavioral Investor Types (Pompian, 2012).

2. Psychographic Profiling and early models: Barnewall Two-way Model and Baillard, Biehl and Kaiser Five-way Model (BB&K Model)

Psychographic Profiling considers the psychological traits of people, such as feelings, desires, motivations, interests, or prejudices. When we want to identify the basic characteristics of an investor, we cannot avoid analyzing their personality, which in sum contains feelings and behavioral patterns.

Investor psychographic profiling, therefore, uses psychology techniques to identify personalities, and in particular, behavioral biases that can lead to mistakes in the investment process. Thus, the main objective of psychographic profiling is to design personalized investment plans according to the psychological characteristics of each investor. Normally these profiles are defined by an advisor or investment manager, therefore, a good profiling that incorporates psychological traits can have benefits such as improving relations

between advisor and investor, since their relationship is closer to the person than to the strictly financial, generating bonds of trust, which are fed back since personalization leads to a deeper knowledge of the investor, and therefore, investment recommendations are much more targeted. It also allows a client-centric vision, more distant from the product and closer to the investor's needs, which results in a relationship of trust that should guide a good investor advisory service.

In this article, we will discuss two psychographic profiling models, the Barnewall Two-way Model (Barnewall, 1987), the Bailard, Biehl and Kaiser Five-way Model (Bailard, T. E., Biehl, D. L. & Kaiser, R. W., 1986), and we will go into what is probably the most advanced model at this time, the Behavioral Investor Types (Pompian, 2012).

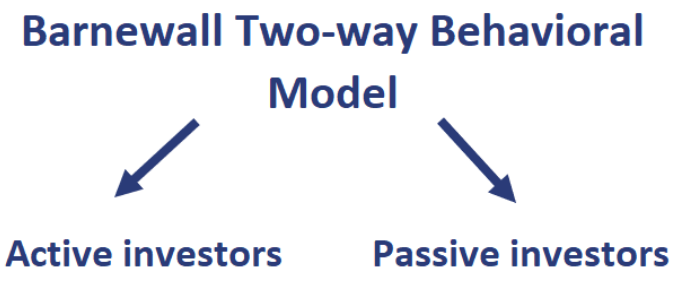
2.1. Barnewall Two-Way Model

Created in 1987 by Marilyn Barnewall, the Barnewall Two-way Model is a simple behavioral model that divides investors into passive and active. Personality traits are assigned depending on the way they created wealth.

The passive investor is someone that created wealth without taking big risks with their money. In this category we can consider from doctors to lawyers.

As their wealth has been created in a steady and safe way, they are prone to be more risk-averse and prefer diversified portfolios. Considered to be easy to work with as they rely greatly on what the financial advisor says. Finally, they tend to seek external approval when taking decisions and follow popular investing trends.

The active investor is someone that created wealth by actively taking monetary risks. In this category we can consider from small business owners to independent professionals.



Source: breakingdownfinance.com

As their wealth depends greatly on past money investments, they are in less need of security and more prone to risks (less diversification). Considered to be more difficult to work with as they demand more control of

their portfolio and the decisions going into it.

2.2. Baillard, Biehl and Kaiser Five-way Model (BB&K Model)

Created in 1986 by Baillard, Biehl & Kaiser, the BB&K Model is a more sophisticated model that divides investors in 5 types: adventurer, celebrity, individualists, guardians, and straight arrows. Personality traits are assigned depending on two dimensions: level of confidence (confident-anxious) and method of action (careful-impetuous) when making decisions.

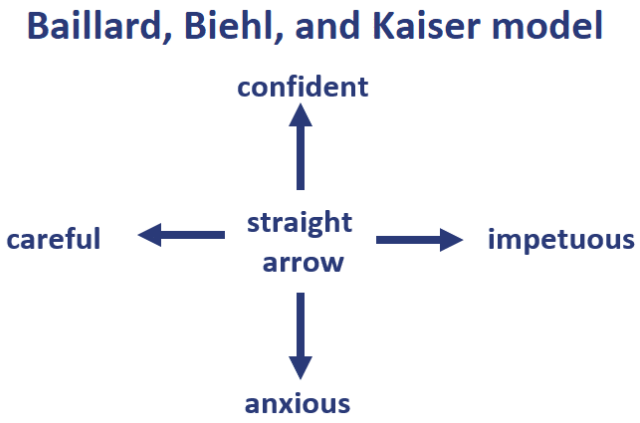
Adventurer: confident and impetuous. Willing to take risks.

Celebrity: anxious and impetuous. Seeking to follow popular investing trends.

Individualist: confident and careful. Likes to make decisions after detailed analysis

Guardians: anxious and careful. Seeking to protect assets.

Straight arrows: average person. Balanced investment approach and willing to take some risk.



Source: breakingdownfinance.com

Both Barnewall Two-way model and Baillard, Biehl and Kaiser Five-way Model laid the foundations for psychographic profiling and served as an inspiration for other models that were created later. The most important of them: Pompian's Behavioral Investor Types, which will be analyzed in more detail.

3. Behavioral Investor Types

3.1. The original method

To understand the BIT methodology properly, it is necessary to know how it was born and how it has evolved to what it is today.

In the first version, Pompian proposed a bottom-up system. Advisors were first to test for any biases that

investors might have and then diagnose and treat them. He created a method that identified and explained the twenty most common biases in the investor's mind and described how to use that information with charts to provide the most appropriate asset allocation for the client.

Pompian soon realized that this method was time consuming, inefficient and ineffective. So, he created a variant he called "Behavioral Alpha" that followed a "top-down" process. The steps of this second variant, which is not the final one, are as follows: first of all, identification of the investor's active and/or passive traits: at the beginning of the advisory process, the advisor should conduct an interview with the investor to understand the investor's objectives, constraints, and past investment experiences. But, in addition to this, it should include appropriate questions to determine whether the investor is "active" or "passive," or, in other words, whether the investor actively participated in the process of building his or her wealth. This refers to the fact whether they had to put their wealth at risk to create more, or if on the contrary this wealth came to them from family, legacy or from a job with a regular income. Understanding these characteristics is really powerful because "passive" investors have a tendency toward one set of biases, while "active" investors have a tendency toward another. For this purpose, a type of test was used which, based on the investor's answers, identified active or passive traits.

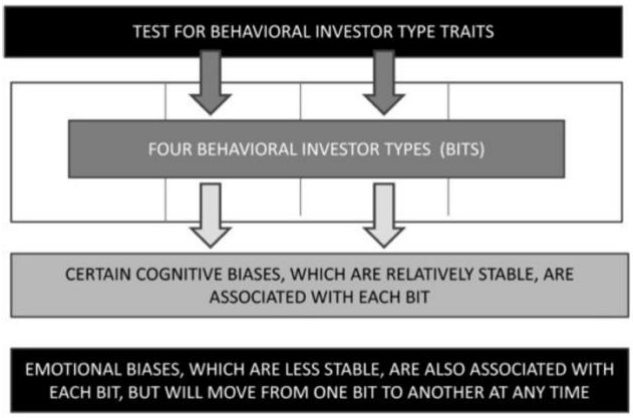
After that, conduct the behavioral bias test. In this test we check whether the active/passive trait test set appropriate expectations. This is done by means of a bias test, by which it is detected if the investor has more emtional or cognitive biases, and within those groups, which are the most relevant biases.

But, on this original method, Pompian introduced a series of improvements whose consequences are: i) identifying the active/passive traits of the investor is no longer a crucial action of the process. Cost-benefit analysis shows that this type of action is not efficient, although this distinction is still important, ii) BITs are defined in a slightly different way, with two new tests, the first discovers the orientation toward each BIT and the second is a bias test, and iii) it is no longer necessary to test for a large number of biases, only one or two for each BIT. This makes the process much simpler and more practical, and also recognizes that there are only a small number of biases that really affect a human being's ability to be faithful to an investment plan for the long term.

3.2. The updated method

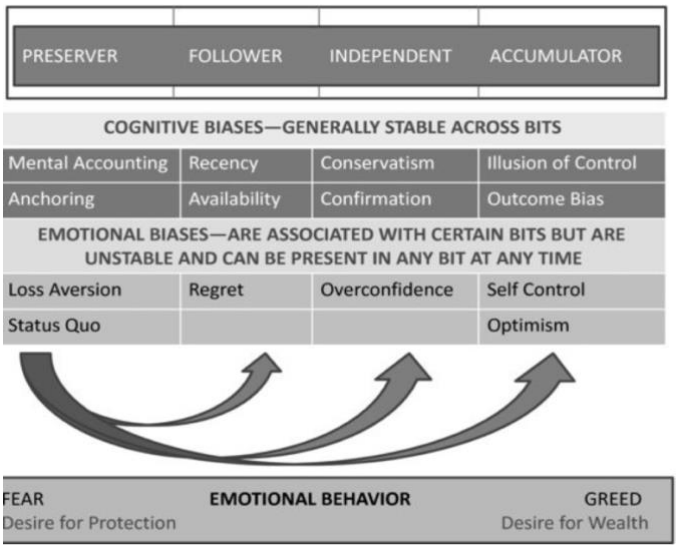
To understand and use it, it is key to keep in mind than first test the investor's orientation to each BIT and then test for sensitivity to one or two biases. By doing this, both the advisor and the investor can be confident that they have identified the right orientation and are working on the most important biases. As well, simplicity

is key. The changes make the process easy to implement. Focus only on what really affects the investor and his or her psychological ability to invest for the long term. Therefore, the crucial thing is to know in advance what kind of behaviors the investor will be susceptible to, and which may limit his or her loyalty to the predetermined investment plan. Thus, by knowing this in advance, the advisor can prepare himself and the investor. Actually, cognitive biases tend to be fairly stable across all BITs, but emotional biases are unstable and can be associated with a single BIT or with all of them at the same time. The following image illustrates the process of the new Behavioral Investor Types theory:



Source: Pompian (2012)

The new BITs theory states that cognitive biases can be mapped and are quite stable, but emotional biases are not. Therefore, the advisor is going to have to be able to deal with emotional biases in a different way in each BIT. Being able to adapt to these differences in magnitude is key for the advisor. Tests are also used for this purpose. The figure below maps the biases to the BITs:



Source: Pompian (2012)

3.3. The BITs, their biases, and how to advise

Having laid the beginnings and evolution of BIT theory and the diagnostic process, it is time to define and dive into each of the BITs.

1. The preserver

BIT Name: Preserver

Primary Orientation: Loss aversion and conscientious decision making.

Dominant Bias Type: Emotional, related to fear of loss and poor decision/action making skills.

Dominant Biases: Loss aversion and status quo

Investment Style: Capital preservation first, growth second. Risk Tolerance: Lower than average

What does a preserver look like?

The BIT preservationist describes an investor who puts the emphasis on their financial security and wealth preservation, leaving aside risk-taking to grow their wealth. These types of investors are guardians of their assets and take losses very seriously. Preservers tend to take many factors into account before deciding which sometimes complicates the process as far as the investment world is concerned (although there is a positive side to this and that is that they tend to limit the number of trades, good for the long- term performance of their portfolios). They have a tremendous regret bias that makes them very afraid of making the wrong decision. They prefer to stick with the status quo and avoid the risk of change. Preservers tend to be obsessed with short-term returns and losses.

There is a correlation between age and this type of investor, a large proportion of preservationists are going to be older people, and it makes sense. As we get older we need to preserve the capital we have created during our lives and we want to use it to take care of our families, leave something for future generations, and also use it for experiences that enhance our own lives, such as buying a home.

The biases that dominate their actions are often emotional in nature, how they feel, and not so much determined by cognitive aspects, related to how they think. The level of wealth has an important effect on the behavior of preservationists. Many preservers who have successfully built up capital want to preserve it at all costs, which causes them to change their attitude to risk to a very conservative one. This is magnified if the investor has experienced a stock market crisis that affected their wealth.

2. The Follower

BIT Name: Follower

Primary Orientation: Little interest in money and investments and usually wants advice when making financial decisions.

Dominant Bias Type: Cognitive, related to follower behavior. Dominant Biases: Topicality bias and framing effect.

Investment Style: Passive

Risk Tolerance: Usually lower than average, but thinks it is higher than it really is. What is the follower like?

What does a follower look like?

The BIT follower describes a passive investor who usually has neither knowledge nor interest in managing and investing their money. Moreover, this type of investor often has no investment ideas of their own, but rather follows a friend, family member, or fad without ever thinking about a long-term plan. This type of investor may delude themselves into thinking they understand the stock market when one of their investments does well, which can lead them to alter their risk profile to an inordinate level. Because they do not create their own ideas about investments, they will be very susceptible to how an investment proposal is presented to them, i.e., they are very susceptible to the framing that is given to the proposal. They also tend to be tremendously susceptible to fads, are afraid of missing out on the good times (FOMO) and end up investing at the worst time at the highest valuations.

One of the biggest challenges of working with followers is teaching them how to stop overestimating their risk tolerance. When they see an attractive investment, they often forget to consider the risk of the investment.

Followers do not usually invest their money without the help of a professional, so for this type of investor, advice is crucial. They are afraid of the financial markets, but if they listen to an idea with a rational that reaches them, they forget about the risk and can make serious mistakes.

Keep in mind that this type of investor does not like the process of investing for several reasons. For example, it is not uncommon to find a very busy professional, with no time to follow their investments, who then behaves like a follower. They are not interested in the investment process because they do not have time nor is it their specialty, but they are a person with concerns and likes to watch the news about the stock market, which they already consider to have studied the possible investment, and even discuss it with their friends,

from whom they do not hesitate to accept some advice on some "hot" investment.

The biases that dominate the followers are cognitive, related to their way of thinking, and not so much emotional, related to their way of feeling. Of course, the level of wealth influences the character of the follower. In many cases affluent followers tend to think that risk is necessary for returns, but they do not realize what risk really entails. This tends to happen especially when investors have experienced a rising market .

3. The Independent

BIT Name: Independent

Primary Orientation: Proactive in the investment process.

Dominant Bias Type: Cognitive, related to the problems of doing your own research for investing.

Dominant Biases: Confirmation and availability bias.

Investment Style: Active

Risk Tolerance: Higher than average.

What does the Independent look like?

The independent investor is the one who has original investment ideas and wants to be part of the investment process. They usually have a contrary view of the market and therefore, it is sometimes difficult for them to follow a long-term investment plan. They are still able to follow these plans if the right techniques are used. At their core, independents are analytical, critical thinkers who base their decisions on logic and instinct. They are willing to take risks and act decisively when they need to. This type of mind-set leads them to be susceptible to biases that can affect their long term goals and put their financial health at risk. For example, acting too quickly after obtaining information that validates their investment thesis, without stopping to study it from the opposite point of view to their own. They often confuse creating an investment thesis conscientiously with reading the financial newspaper. On their way to returns, being only almost prepared, they leave many points untouched that may be the key to not making major mistakes. Independents have a high level of understanding of risk and are realistic in understanding the pain involved. But, when their investments fail, they have a hard time admitting they made a mistake. They may like to work with a financial advisor, but more to have them as another source of financial information than to allow them to actually advise them. Still, they can become very good clients, even if they consume quite a bit of the advisors' time, if the advisor is able to create a reasonable investment plan that leaves some freedom for the investor's own

ideas.

4. The Accumulator

BIT Name: Accumulator

Primary Orientation: Interested in accumulating wealth and confident in their abilities to invest.

Dominant Bias Type: Emotional, related to their overconfidence and desire to influence the investment process.

Dominant Biases: Overconfidence and Illusion of control.

Investment Style: Actively involved in decision making.

Risk Tolerance: High to very high.

What does the Accumulator look like?

The accumulator is an investor who is both interested in achieving wealth and confident in their ability to do so. This BIT has typically been successful in business and believes they will translate that success into their investments. As such, they tend to want to adjust their portfolio to market conditions and do not like to follow a structured plan. Moreover, they tend to want to have full control of their investments and therefore limit the support that a financial advisor can provide. Accumulators like risk and tend to believe that, whatever path they take, it is the right one. They differ from the other groups in that, unlike preservers, they want to earn, and earn a lot. Also unlike followers, they are self-reliant and want to be the captain of the ship. And as opposed to independents, they tend to consider all the details before making a decision, not just the information that supports their investment thesis. The problem they have is that because of their self-confidence they forget that there are factors that affect their investments that have nothing to do with their reasoning abilities. They tend not to take into account that investment vehicles undergo changes in value that, for the time being, are considered random and even have risks that they do not even know about. One problem with accumulating investors is that when they fail, they suffer not so much from the loss of money as from the attack on their own confidence, and this often has dire effects on their financial health. It is difficult for an advisor to build a close relationship of trust with an accumulator, as they are trying to make their own decisions without taking advice. Typically this type of investor is an entrepreneur who has generated their own wealth and is even more selfconfident than the independent. When left unadvised they tend to make too many trades which is very negative for long term returns. In addition, they tend not to rely on basic investment principles such as diversification or compound interest.

4. Flaws in the data collecting process of psychographic profiling

Although in theory all three models are interestingly built, reality is they might fall short in practice. All three models, in order to categorize and carry out the psychographic profiling, rely on standardized testing. Most of them in the multiple-choice standardized test.

Standardized testing limitations are well known in today's modern world. Created by Frederick J. Kelly as a response to the shortage of teachers fighting in World War I. America needed to boost the education system to move students to the working force while dealing with the just mentioned teacher shortages. The solution: standardized testing. Easy to make, easy to grade. Considered a "fair" grading system that treats every student the same. Since then, standardized tests (particularly multiple choice) became the norm (SATs or university entrance exams took them as their forms of evaluation). This made Frederick J. Kelly state, "These tests are too crude to be used and should be abandoned". The No Child Left Behind Act (NCLB) mandated annual testing in all 50 states in 2001.

Standardized testing has not only been critiqued by their own creator, but also by several organizations such as the American Psychology Association (APA), or the National Center for Fair and Open Testing. Even award-winning books such as Freakonomics (Levitt and Dubner, 2005) have dedicated pages to critize this method of evaluation.

Some of the most used arguments are:

- Enhances emotional biases and cognitive errors.
- Non reliable (as results may vary depending on the day)
- Don't satisfy what should be nowadays evaluation system

This is said to be one of the greater problems in modern America, with US students moving from the 18th in the world in math, 14th in science and 15th in reading in 2000 to 40th, 25th and 24th in 2015. Being "the pervasive use of standardized tests one of the main causes".

All of this contrarian evidence has been observed in the education territory (as it is where more evidence exists), however these shortcomings can be easily extrapolated to every other area concluding that standardized testing might not be the answer.

With this being said, psychographic profiling might be a step forward in the back-office portfolio creation but leaves much to be desired in the front-office where data is collected. A good model but poor execution in the

data collection territory leads to a poor interpretation and therefore a not quite desired portfolio.

Lacking the behavioral approach at data collection and smelling same old classical finance, it is mandatory to propose XXI Century solutions to a XXI Century problem.

The process of information exchange in a research interview or questionnaire can be understood as the interaction between two agents, interviewer and interviewee, whose behavior is governed by the general rules of social interaction. Both agents are united in a common task of giving and obtaining information. The quality of the data obtained in this exchange is the basic criterion that can be used to evaluate the success of this information exchange (Bradburn, 1978).

Thus, the Satisficing theory (Krosnick, 1991), widely considered in the literature as 1/useful and 2/an appropriate description of the survey response process (Roberts et al., 2019), was born to respond to measurement error, i.e. the difference between the response obtained in the questionnaire and the ideal measurement (Groves er al., 2011). This error can reduce the efficiency of the data due to the introduction of noise in the measurements of the different variables and their relationships with other variables, which can lead to either an overestimation or underestimation of the importance of the effect to be measured (Alwin, 2007).

According to (Krosnick, 1991), satisficing can be defined as a behavior carried out by the respondent that consists of answering a questionnaire with sufficiently good answers when answering optimally requires too much effort. Optimizing behavior would be that which involves answering a survey with maximum effort. There are two types of satisficing: weak satisficing and strong satisficing, depending on the degree of effort the respondent puts into answering the questionnaire accurately. (Krosnick, 1991) considers it appropriate to define strong satisficing and optimizing as the two ends of a continuum indicating the degree of meticulousness and bias in the data collection process.

The different levels of satisficing are associated with concrete behaviors through which respondents seek to reduce the effort put into answering the survey (Krosnick, 1991). Some of these behaviors are selecting the first acceptable alternative from a list (without bothering to read the whole list), acquiescence or tendency to agree with the statements made in the items or questions, preference for intermediate alternatives or the status quo in the responses, or non-differentiation in the response to different items.

With all this, there are lines of research to develop proxies to the degree of satisficing that respondents have when answering the survey (Meade & Craig, 2012);(Huang et al., 2012). Some of them can be: analyzing non-

response to certain items (Mavletova, 2015), length of responses in open-ended questions (Mavletova, 2015), using rounded values in questions involving numerical responses (Schober et al., 2015), straight-linning or always answering the option positioned in the same place in the questionnaire (Schonlau & Toepoel, 2015), speeding or speeding up answering as one progresses through the questionnaire (Zhang & Conrad, 2014), bogus items or items with a clear correct answer, consistency indices, multivariate outlier detection techniques and even directly asking the respondent about his or her level of attention when answering (Meade & Craig, 2012).

On the other hand, the probability that a particular respondent will engage in satisficing can be modeled on the basis of what are called mediating conditions (Krosnick, 1991) as follows:

$$p(Satisficing) = a1(TaskDifficulty)/(a2(Ability) \cdot a3(Motivation))$$

Where the task difficulty of answering the questionnaire is evaluated on the basis of the 4 phases through which the respondent goes through when answering an item (Tourangeau,1984): Understanding the question, searching in memory the relevant considerations to answer, integrating the information collected in the judgment and selecting among the available response categories the one that best fits. Difficulty is also affected by external distracting elements (Meade & Craig, 2012);(Krosnick, 1991).

Thus, respondent ability can be related to satisficing behaviors in three ways: 1/ the respondent's level of cognitive sophistication, i.e., the respondent's ability to perform complex mental operations (Krosnick and Alwin, 1987; Schuman and Presser, 1981), 2/ the respondent's practice in thinking about the particular survey topic, and 3/ the degree to which a particular respondent has a preconceived idea about the survey topic.

Finally, the level of motivation can be affected in multiple ways. The most obvious are the length of the questionnaire (Meade & Craig, 2012);(Krosnick, 1991), the degree of interest the respondent has in the survey topic (Schwarz, 1999);(Tourangeou et al., 2000);(Meade et al., 2012), the degree of certainty the respondent has about whether the survey results will be useful for some segment of society or some personality traits such as need for cognition (Cacioppo and Petty 1982, 1984) or accountability (Tetlock, 1983a; Tetlock and Kim, 1987).

In a parallel approach to that of satisficing, (Nichols et al., 1989) distinguishes two different types of problematic response in a questionnaire: on the one hand, there are content-responsive faking responses, which are characterized by being influenced by the content of the item, but not being completely accurate. This type of response is very similar to the weak satisficing behaviors proposed by (Krosnick, 1991) but with

the difference that (Nichols et al., 1989) contemplate the possibility that these responses are deliberately inaccurate or directly erroneous, responding to a motivation generated in the respondent by the context surrounding the questionnaire.

As an example for this point, screening questionnaires administered at airports in the phases following COVID19 confinement can be considered (Vora & Kulkarni, 2021). In this type of questionnaire, passengers are asked to indicate whether they have been in areas of high COVID19 incidence in the past few days. Those who answer affirmatively will be tested for antigens and, if positive for COVID19, will be confined for 15 days. In this situation, those passengers who actually come from one of these zones will have incentives to lie on the questionnaire at the risk of being confined for 15 days.

The second type of response proposed by (Nichols et al., 1989) would be content nonresponsivity, that is, responding without taking into account the content of the proposed item. This type of response is very similar to the strong satisficing behaviors proposed by (Krosnick, 1991), the random responses described in (Beach, 1989) and (Berry et al., 1992), careless responding (Curran et al., 2010) and protocol invalidity (Johnson, 2005).

When facing possible situations of low quality data obtained in a questionnaire, there are two possibilities (Schacht et al., 2017): a reactive way to act would be to deploy the survey, obtain the data and, subsequently, eliminate the responses of inattentive respondents and a more proactive alternative would be to try to make the survey more entertaining by turning it into a "more fun social experience" (Downes-Le Guin et al., 2012, p. 614). Specifically, gamification is currently being explored as a method to increase the motivation of respondents when answering a survey. Gamification can be defined (Deterding et al., 2011) as "The use of game design elements in non-game contexts." Such elements are referred to as motivational affordances (Hamari et al., 2014). These elements can generate both psychological (user experience) and behavioral effects (reduction of satisficing behavior in a survey). Both effects would be interrelated, since the psychological effects would be the necessary antecedent to achieve behavioral change. Some of the most commonly used gamification elements in scientific studies are: points, challenges, leaderboards, achievements/ badges, levels, story, clear objectives, feed-back, rewards or progress (Hamari et al., 2014).

The goal of gamifying a survey is to make the survey more relevant, challenging, engaging, and valuable to the user, resulting in a more positive survey experience (Keusch & Zhang, 2015). The ultimate goal is to reduce respondent burden (Bradburn, 1977) and survey fatigue (Adamou, 2014), reduce the costs of recruiting survey participants, and achieve more representative samples (Harrison, 2011). The reduction of respondent burden increases the motivation to respond to the survey which in turn should translate into a reduction of satisficing

behaviors resulting in a higher quality of the data collected (Cechanowicz, 2013).

Two of the psychological outcomes derived from a well-implemented gamification are, on the one hand, inducing the respondent to a state of flow (Csikszentmihalyi, 1975), defined by (Hsu & Lu, 2004) as "An extremely enjoyable experience, where an individual engages in a [....] game activity with total involvement, enjoyment, control, concentration, and intrinsic interest." and the state of cognitive absorption, which according to the work of (Agarwal & Karahanna, 2000), cognitive absorption is a multidimensional construct composed of concentrated immersion, increased enjoyment, temporal dissociation, curiosity and control.

On the other hand, social scientists face a particular challenge in developing scales and items with which to measure psychological dimensions: they cannot directly measure the things they are interested in, they are not visible and tangible. This is what is called the latency problem (Clifton, 2020). One way to solve this latency problem is to directly ask the individual for that information. *"The individual is in a unique position to report his or her own thoughts, feelings, wishes and dreams"* (Kadzin, 2021). There is a large body of literature focused not so much on the behaviors that respondents engage in when interacting with the survey, but on the survey design itself, looking at how to ensure that the items used in the survey are both valid and reliable (Clifton, 2020; Abad & Ponsoda, 2012; Groves et al., 2011). The validity of a scale or item refers to the degree to which the scale or item measures what it claims to be measuring (DeVellis, 2021).

Likewise, there are multiple types of validity: construct, content, concurrent, predictive, criterion, factor, convergent or discriminant (John & Soto, 2007);(Kadzin, 2021). Reliability is based on the premise that, for a measurement scale to be accurate, it must return consistent measurements when measuring the same phenomenon. Therefore, if a scale is consistent then it could be accurate (Clifton, 2020). There are multiple ways to analyze the reliability of a scale: examining consistency between individual items, between random subsets of items, between different versions of the scale, between assessors' perspectives, between results of the same scale at different points in time, etc. (Anastasi & Urbina, 1997);(Kadzin, 2021).

In addition, there are dynamics that relate validity to reliability, (Loevinger, 1954) introduces the term attenuation paradox to demonstrate mathematically that validity sometimes increases when reliability increases, but at other times the dynamics are reversed and validity decreases as reliability increases. (Clifton, 2020) locates the source of this tradeoff in the decisions that scale and item designers make when deciding on item content, item construction, item difficulty, item order and item analysis.

Based on the aforementioned, we propose that a questionnaire aimed at financial profiling should be designed with emphasis on two points: on the one hand, special attention should be paid to ensuring the correct validity

and reliability of the scales used to measure the psychographic dimensions of the individuals. To this end, it is recommended to use scales already proposed in the literature that have been appropriately tested or, in the case of proposing an ad hoc scale for the questionnaire, to carry out the corresponding analysis to ensure adequate validity and reliability values. On the other hand, it is essential to take into account when designing the questionnaire the context in which it is administered and how individuals will behave when answering it. Specifically, it is proposed to focus on studying the propensity of individuals to carry out satisficing behaviors when answering the questionnaire. The satisficing behaviors can be mitigated by gamification techniques. However, it is recommended to combine these gamification techniques with data quality analysis techniques such as consistency indices, speeding or bogus items to ensure the quality of the data once collected.

5. Conclusion

This article has exposed the convenience, within the framework of investment analysis, of a correct psychographic profiling of investors. Traditionally, such profiling has been based on the assessment of the risk that investors can tolerate from an exclusively classical finance point of view.

Behavioral finance has highlighted the need to incorporate behavioral aspects, including investor psychology. To this end, several models have been developed, with Pompian's Behavioral Investor Types being the most advanced and complete to date.

However, when put into practice this model suffers from a lack of precision too, not so much in the model itself as in the form of collection of the data that feeds the psychographic types. The extensive use of standardized testing provokes numerous biases in the respondent's answers that may deliver unsatisfactory profiling results, and thus in the final stages, fail to provide adequate financial planning to the investor needs.

This article presents a detailed analysis of the information gathering of psychographic profiling, and its flaws, suggesting improvements, both by employing different types of behavioral tools, within a gamified experience, and by improving the current form of testing.

There is undoubtedly plenty of room for research in improving not only the psychological and economic analysis of investors, and their classification into behavioral types, but also in the data collection itself, in line with what we intend to point out here.

6. References

Abad, F. J., & Ponsoda, V. (2012). Medición en ciencias sociales y de la salud. Síntesis.

Adamou, B. (2014). Research games as a methodology: the impact of online research games upon participant engagement and future research game participation. Research Through Gaming Ltd.

Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS quarterly, 665-694.

Alwin, D. F. (2007). Margins of error: A study of reliability in survey measurement. John Wiley & Sons.

Anastasi, A., & Urbina, S. (1997). Psychological testing. Prentice Hall/Pearson Education.

Bailard, Thomas E,, Biehl, David L,, Kaiser, Ronald W. (1986). Personal money management (Fifth Edition). Science Research Associates.

Barnewall, M. M. (1987). Psychological Characteristics of the Individual Investor. ICFA Continuing Education Series, (2), 62–71. https://doi.org/10.2469/cp.v1987.n2.7

Beach, D. A. (1989). Identifying the random responder. The Journal of psychology, 123 (1), 101-103.

Berry, D. T., Wetter, M. W., Baer, R. A., Larsen, L., Clark, C., & Monroe, K. (1992). MMPI-2 random responding indices: Validation using a self-report methodology. Psychological assessment, 4 (3), 340.

Bradburn, N. (1978, August). Respondent burden. In Proceedings of the Survey Research Methods Section of the American Statistical Association. American Statistical Association.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. Journal of personality and social psychology, 42 (1), 116.

Cacioppo, J. T., & Petty, R. E. (1984). The need for cognition: Relationship to attitudinal processes. Social perception in clinical and counseling psychology, 2, 113- 140.

Cechanowicz, J., Gutwin, C., Brownell, B., & Goodfellow, L. (2013). Effects of Gamification on Participation and Data Quality in a Real-World Market Research Domain.

Clifton, J. D. (2020). Managing validity versus reliability trade-offs in scale-building decisions. Psychological Methods, 25 (3), 259.

Csikszentmihalyi, M. (1975). Beyond boredom and anxiety. The Jossey-Bass behavioral science series.

Curran, P. G., Kotrba, L., & Denison, D. (2010, April). Careless responding in surveys: Applying traditional techniques to organizational settings. In 25th annual conference of Society for Industrial and Organizational Psychology, Atlanta, GA.

Davidson, C. N. (September 23, 2011). Standardized tests for everyone? In the Internet age, that's the wrong answer. The Washington Post. https://www.washingtonpost.com/opinions/standardized-tests-for-everyone-in-the-internet-age-thats-the-wrong-answer/2011/09/21/gIQA7SZwqK_story.html?sw_bypass=true

Deterding, S., Khaled, R., Nacke, L. E., & Dixon, D. (2011, May). Gamification: Toward a definition. In CHI 2011 gamification workshop proceedings (12). 1-79.

DeVellis, R. F., & Thorpe, C. T. (2021). Scale development: Theory and applications. Sage publications.

Dillman, D. A. (1978). Mail and telephone surveys: The total design method (Vol. 19). Wiley.

FairTest. (May 22, 2012). What's wrong with standardized test?. fairtest.org. https://fairtest.org/facts-whatwron-htm/

Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. The Journal of Finance, 25(2), 383–417. https://doi.org/10.2307/2325486

Groves, R. M., et. al. (2011). Survey methodology. John Wiley & Sons.

Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-saliency theory of survey participation: description and an illustration. The Public Opinion Quarterly , 64 (3), 299-308.

Guin, T. D. L., Baker, R., Mechling, J., & Ruyle, E. (2012). Myths and realities of respondent engagement in online surveys. International Journal of Market Research, 54 (5), 613-633.

Hamari, J., Koivisto, J., & Sarsa, H. (2014, January). Does gamification work?—a literature review of empirical studies on gamification. In 2014 47th Hawaii international conference on system sciences,3025-3034. Ieee.

Harrison, P. (2011). The researchification of games: Adopting a game designer's approach to market research. In ESOMAR Congress Miami.

Hsu, C. L., & Lu, H. P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. Information & management, 41 (7), 853-868.

Huang, J. L., et. Al. (2012). Detecting and deterring insufficient effort responding to surveys. Journal of Business and Psychology, 27(1), 99-114.

John, O. P., & Soto, C. J. (2007). The importance of being valid: Reliability and the process of construct validation.

Johnson, J. A. (2005). Ascertaining the validity of individual protocols from web-based personality inventories. Journal of research in personality, 39 (1), 103-129.

Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. Econometrica, 47(2), 263–291. https://doi.org/10.2307/1914185

Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. Applied cognitive psychology, 5 (3), 213-236.

Krosnick, J. A., & Alwin, D. F. (1987). An evaluation of a cognitive theory of response- order effects in survey measurement. Public opinion quarterly, 51 (2), 201-219.

Levitt, S. D., & Dubner, S. J. (2005). Freakonomics: A rogue economist explores the hidden side of everything. William Morrow & Co.

Lintner, J. (1965) The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. The Review of Economics and Statistics, 47, 13-37. http://dx.doi.org/10.2307/1924119

Markowitz, H. (1952). Portfolio selection*. The Journal of Finance, 7, 77-91. https://doi.org/10.1111/j.1540-

6261.1952.tb01525.x

Mavletova, A. (2015). Web surveys among children and adolescents: is there a gamification effect? Social Science Computer Review, 33(3), 372-398.

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. Psychological methods, 17(3), 437.

Mossin, J. (1966) Equilibrium in a Capital Asset Market. Econometrica, 34, 768-783. http://dx.doi.org/10.2307/1910098

Myers, J. (January 12, 2023). What type of investor are you?. Psychonomics. http://www.psychonomics.com/research/a&s/profiling.htm .

Pompian, M. (2012). Behavioral Finance and Wealth Management . John Wiley & Sons, Inc.

Pompian, M. M. (2012). Behavioral Finance and Investor types. Wiley Finance.

ProCon.org. (July 12, 2020). Do standardized tests improve education in America? ProCon.org. https://standardizedtests.procon.org/

Roberts, C., Gilbert, E., Allum, N., & Eisner, L. (2019). Research synthesis: Satisficing in surveys: A systematic review of the literature. Public Opinion Quarterly, 83 (3), 598- 626.

Schacht, S., Keusch, F., Bergmann, N., & Morana, S. (2017). Web survey gamification–increasing data quality in web surveys by using game design elements.

Schonlau, M., & Toepoel, V. (2015, July). Straightlining in Web survey panels over time. Survey Research Methods, 9 (2), 125-137.

Schwarz, N. (1999). Self-reports: How the questions shape the answers. American psychologist, 54 (2), 93.

Sharpe, W.F. (1964). Capital asset prices: a theory of market equilibrium under conditions of risk*. The Journal of Finance, 19, 425-442. https://doi.org/10.1111/j.1540-6261.1964.tb02865.x

Shuman, H., & Presser, S. (1981). Questions and answers in attitude surveys. AcademicPress.

Smith, M. G., et. al. (2019). Effectiveness of incentives and follow-up on increasing survey response rates and participation in field studies. BMC medical research methodology, 19 (1), 1-13.

Tourangeau, R. (1984). Cognitive sciences and survey methods. Cognitive aspects of survey methodology: Building a bridge between disciplines, 15, 73-100.

Tourangeau, R., & Yan, T. (2007). Sensitive questions in surveys. Psychological bulletin, 133 (5), 859.

Tourangeau, R., Rips, L. J., & Rasinski, K. (2000). The psychology of survey response.

Truyts, T. (2014). Stochastic Costly Signaling with Exogenous Information.

Von Neumann, J., & Morgenstern, O. (1944). Theory of games and economic behavior. Princeton University Press.

Vora, A. S., & Kulkarni, A. A. (2021, June). Optimal questionnaires for screening of strategic agents. In ICASSP 2021-2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 8173-8177). IEEE.

Zhang, C., & Conrad, F. (2014, July). Speeding in web surveys: The tendency to answer very fast and its association with straightlining. Survey research methods, 8(2), 127-135.