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Maximizing versus Satisficing in the Digital Age:
Disjoint scales and the case for “construct consensus”

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Abstract

A question facing us today, in the new and rapidly evolving digital age, is whether searching for the best option – being a maximizer – leads to greater happiness and better outcomes than settling on the first good enough option found – or “satisficing.” Answers to this question inform behavioural insights to improve well-being and decision-making in policy and organizational settings. Yet, the answers to this fundamental question of measurement of the happiness of a maximizer versus a satisficer in the current psychological literature are: 1) conflicting; 2) anchored on the use of the first scale published to measure maximization as an individual-difference, and 3) unable to describe the search behaviour of decision makers navigating the digital world with tools of the 21st century - apps, smartphones or tablets, and most often all of them. We present, based on a review and analysis of the literature and scales, a call to stop the development of more maximization scales. Furthermore, we articulate the argument for a re-definition of maximizing that balances the face validity of the construct and the relevance to decision making in an age of digital tools so that future scales are useful for future choice architects and researchers.

Keywords: maximizing, satisficing, individual differences, decision making, scale anchoring bias, digital search tools.

Maximizing versus Satisficing in the Digital Age:

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1. Maximizing versus Satisficing: from models to humans

In the first definition of maximizing and satisficing (Simon, 1955; 1956), maximizing is not the trait of a human decision maker, but of a ‘model’, and represents the search for the very best solution among those that can be computed. As such, maximising is not to be found in the real world, and is a property of rational decision models (von Neumann & Morgenstern, 1944). On their own, humans (and non-human animals) do not, and cannot, maximize. Rather, they satisfice, seeking satisfactory, or good enough, solutions instead of optimal ones because of the complexity of the world, the limitations of human unaided information processing, and time pressure, to name a few reasons.

Simon’s seminal distinction between maximizing and satisficing happened at a time where faith in individual difference research and the ability of personality tests to predict behaviour reliably was at an historical low (Mischel, 2004). It is not surprising that it took almost half a century for this distinction to anthropomorphize and become accepted, and published, as an individual difference or trait (Schwartz et al. 2002).

Schwartz et al’s Maximization Scale (MS) is the first in the history of decision making research and is of fundamental importance. According to this scale, maximization is a human trait: there are maximizers and satisficers. Maximizers are those who consistently attempt to find the “best” solution (which demands an exhaustive search of the options), while satisficers consistently attempt to find a solution that is satisfactory or “good enough” (which can be met by a non-exhaustive search). For example, a

maximizer would look for a holiday resort by comparing all hotels available at a particular tourist destination, spending lots of time and effort trying to find the very best price, location, and room. A satisficer, on the other hand, would consider what is acceptable, and search only until he or she encounters the first one that exceeds this threshold of acceptability. This scale has 13 items, such as: “When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program.”, “I treat relationships like clothing: I expect to try a lot on before I get the perfect fit.”, “No matter what I do, I have the highest standards for myself.” Answers are on a seven-point scale, ranging from 1 (completely disagree) to 7 (completely agree). High scores on the measure reflect a tendency to maximize, while low scores reflect a tendency to satisfice. Thus, in Schwartz’s conceptualization, maximizing and satisficing are opposite ends of a continuum (Schwartz, 2004; Schwartz et al., 2002).

Findings based on the use of this scale have first established a relationship between the tendency to maximize (versus satisfice) and personal well-being with the conclusion that maximizers are less happy than satisficers. In particular, maximizers experience less life satisfaction, happiness, optimism, and self-esteem than satisficers. They also experience more regret, depression, and tendency towards perfectionism than satisficers (Schwartz et al., 2002). As Schwartz and colleagues put it, “happiness is a matter of choice.”

The negative connotation of being a maximizer and the notion that happiness is associated with satisficing stirred and attracted considerable subsequent research. Using the original MS, researchers found that maximizers are less satisfied with their decisions and with their lives in general than satisficers. They regret their choices more; they are

less happy, less optimistic and more depressed (e.g., Chang, Herringshaw, Sanna, Perera, & Marchenko, 2011; Dar-Nimrod, Rawn, Lehman, & Schwartz, 2009; Iyengar, Wells, & Schwartz, 2006; Purvis, Howell, & Iyer, 2011).

Based on this initial research, a “focus on satisficing” was recommended as a tool for choice architecture in an important review of behavioural insights to improve well-being and decision-making in policy and organizational settings (Johnson et al., 2012). Getting the construct and findings right is therefore of great theoretical, methodological and practical importance.

A few years after its publication, the Maximisation Scale started to be subject to thorough methodological scrutiny. It has now been replaced by many better scales, some developed with the contribution of the authors of the original scale itself. However, researchers seemed not to follow this methodological scrutiny, and, many scales later, the original conclusion (“satisficers are happier than maximizers”) has been confirmed and disconfirmed several times leading to substantial confusion among the results.

The proliferation of scales after the MS is due to a number of reasons (Lai, 2010; Turner, Rim, Betz, & Nygren, 2012), from desire to establish reliability and theoretical validity (Nenkov, Morrin, Ward, Schwartz, & Hulland, 2008) to the aim of encompassing the multi-dimensional nature of a maximizing decision behavior (Diab, Gillespie, & Highhouse, 2008). As a result, different dimensions of the scale have been suggested as key predictors of well-being, leading to conflicting empirical results and confusion as to what is the ‘right’ scale for capturing maximizing behaviour.

Next we provide a theoretical review of the maximizing scales available in the literature to date, with a view to make future researchers aware of the menu available, differences between the existing scales, and inconsistency between empirical results.

2. One concept, many scales

The table overleaf summarises the discrepancy and evolution of scales over the past 15 years. Nenkov et al. (2008) were the first to examine the factor structure of the Maximization Scale and found that the maximization construct in this scale is divided into three separate factors, or sub-constructs. One factor (labelled *alternative search*) reflects the tendency to explore a large number of options (e.g., “When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I am relatively satisfied with what I am listening to.”). Another factor (labelled *decision difficulty*) represents the difficulty associated with choosing and making decisions (e.g., “Renting videos is really difficult. I am always struggling to pick the best one.”).

(Insert Table 1 about here)

The third factor (labelled *high standards*) reflects the maximizers’ tendency to search for the best alternative, and hold high standards for themselves and things in general (e.g. “I never settle for second best.”). All three factors were positively correlated with regret. Furthermore, the decision difficulty and alternative search factors were negatively correlated with happiness and optimism, and positively correlated with depression. The high standards factor, instead, was not correlated to any of these three variables (see Table 2).

(Insert Table 2 about here)

Nenkov et al.'s (2008) analyses on the psychometric properties of the Maximization Scale revealed some problematic items, which were eliminated from the subsequent scale. A shortened 6-item version of the Maximization Scale was shown to have superior psychometric properties compared to the original 13-item scale, and was thus recommended by the authors for future use (MS-6).

In the same period of Nenkov et al.'s work (2008), Diab et al. (2008) proposed an alternative measure of the tendency to maximize versus the tendency to satisfice. Based on the assumption that the maximization behavior is one-dimensional, internally consistent and that 10 out of the 13 items of the Maximization Scale diverged from Simon's original conceptualization of maximizing as choice goal (general tendency to pursue the identification of the optimal alternative), the authors developed a nine-item Maximizing Tendency Scale (MTS) which consists of the three items of the "high standards" factor of the Maximization Scale (e.g., "No matter what I do, I have the highest standards for myself."), plus an additional six items that emphasize the decision makers' goal to maximize the outcomes of their decisions (e.g., "No matter what it takes, I always try to choose the best thing."). Thus, the MTS measured only one factor reflecting the conceptualization of maximizing as "the general tendency to pursue the identification of the optimal alternative" (Diab et al., 2008, p. 365). Findings by using this new, theory-based, measure showed that maximizers *are* happier than satisficers, and the tendency to maximize is not correlated with life dissatisfaction or with maladaptive style¹. The authors concluded that the interpretation of maximizers as less happy than

¹ Adaptive or maladaptive decision making styles were measured according to the Decision Making Style Inventory (Nygren, 2000; Nygren & White, 2002). An example of a person with an "adaptive decision making style" is one who, when shopping for a

satisficers is wrong, and due to poor measurement of the core construct (Diab et al., 2008).

Consistent with Diab et al.'s (2008) assumption that maximizing is the tendency to pursue the identification of the optimal alternative, a further mono-dimensional 5-item scale was introduced by Lai (2010, Modified Maximizing Scale - MMS). This measure consists of items that reflect the pursuit of the best possible solution by systematically comparing all the available options, and does not include any items for the decision difficulty factor. Some of the items are: "I am uncomfortable making decisions before I know all my options.", "Before making a choice, I consider many alternatives thoroughly." Findings using this modified scale showed that the maximizing tendency is positively correlated with optimism, need for cognition, desire for consistency, risk aversion, intrinsic motivation, self-efficacy and perceived workload. With this scale, maximizing tendency was found to be unrelated with regret. The author concluded that decision difficulty is the key factor that leads to negative correlations between the tendency to maximize and well-being, and thus it should be conceptualized as a separate dimension rather than as a facet of the maximizing construct.

A subsequent series of studies by Rim, Turner, Betz, and Nygren (2011) on the Maximization Scale (Schwartz et al., 2002) and the Maximizing Tendency Scale (Diab et al., 2008) revealed that both the decision difficulty and the alternative search factors are negatively correlated with well-being indices, such as procrastination and regret-based decision making style. The high standards factor, instead, was found to be strongly

branded product like a perfume, would switch to a substitute when the preferred brand is not available at a store, whereas the maladaptive would not.

positively correlated with indices of well-being (e.g., optimism and happiness), functioning (e.g., self-esteem and self-efficacy), and analytical decision making style. Because of its positive correlation with adaptive variables, Rim et al. concluded that the high standards items should be eliminated from the measurement of maximizing.

Building on Rim et al. (2011) series of studies, Turner et al. (2012) developed a new 34-item maximization measure (the Maximization Inventory - MI) which draws from the original Maximization Scale only the alternative search (12 items) and the decisional difficulty (12 items) factors. In the Maximization Inventory, however, the content of the items is more generic (e.g., “When shopping, I plan on spending a lot of time looking for something.”; “I often experience buyer’s remorse.”) to avoid that questions referred to a too specific context (e.g., “Renting videos is really difficult. I am always struggling to pick the best one.”) could impede the correct measurement of the construct because of a lack of personal experience of the respondent in that specific context. In addition to the alternative search and decisional difficulty items, the novelty of the Maximization Inventory is to include a separate scale developed to directly measure the satisficing construct (10 items, e.g., “I usually try to find a couple of good options and then choose between them.”). As Turner et al. (2012) pointed out, the previous maximizing scales’ items only measured the degree to which an individual tends to maximize. The satisficing behaviour was only indirectly measured, conceptualized as the opposite end of the maximizing continuum. Turner et al.’s (2012) measure was shown to have better psychometric properties than the original Maximization Scale. Importantly, when measured separately from the maximizing construct, the satisficing construct turned out to be *positively* correlated with most of the well-being and functioning indices (e.g.,

happiness, optimism, self-efficacy, self-regard), good mental health, as well as adaptive decision making. Decision difficulty was, again, negatively correlated with optimism, self-efficacy, and self-regard, and with adaptive decision making styles. The alternative search scale was uncorrelated with any of the well-being indices and negatively correlated with adaptive decision making style. Furthermore, a comparison of the Maximization Inventory with the major existing maximization scales showed that decisional difficulty and alternative search were positively correlated with similar previous constructs, while instead the satisficing scale was not inversely related with the Maximization Scale and was only weakly correlated with the Maximizing Tendency Scale. The authors concluded that satisficing is a separate, independent construct from the maximizing tendency.

In the same period as Turner et al.'s work, Weinhardt, Morse, Chimeli, and Fisher (2012) further investigated the construct validity of maximizing and the psychometric properties of both the Maximization Scale (Schwartz et al., 2002) and the Maximizing Tendency Scale (Diab et al., 2008). They found that Schwartz et al.'s original scale and Diab et al.'s scale measure two different constructs: the original Maximization Scale measures the difficulty and restlessness with the search for the best choice option, whereas the Maximizing Tendency Scale measures the tendency to search for the best alternative. According to Weinhardt and colleagues, high standards and searching for the best alternative is again a valid measure of maximization behaviour in line with Simon's original conceptualization of maximizing as an optimization goal (1955; 1956). We remind the reader that this conclusion contradicts Rim et al. (2011) who suggested for the high standards construct to be eliminated from the concept of maximization.

In order to improve the overall reliability and construct validity of both MS and MTS scales, Weinhardt and colleagues identified and removed six problematic items from the Maximization Scale (Revised MS) and three problematic items from the Maximizing Tendency Scale (Revised MTS). These items were considered problematic because they contained little information on the maximizing construct (e.g., “I treat relationships like clothing: I expect to try a lot on before I get the perfect fit.”). The revised MS measured only the high standards factor, whereas the Revised MTS measured high standards, decision difficulty, and alternative search. An examination of these two revised shorter scales in relation to other measures of well-being showed that maximizers are not generally unhappy, but they are distressed while making decisions. The authors consider their Revised MTS more consistent with the original definition of the maximizing concept (Simon, 1955; 1956) and they thus recommend its use for future research.

Mikkelsen and Pauley (2013) introduced for the first time a domain-specific maximizing scale (Relational MS), entirely focused on romantic relationships, and founded on one relational maximizing score, equivalent to the sum of the three sub-constructs of maximization embedded in the original MS (high standards, decision difficulty, and alternative search). Some of the items are: “I wonder if I would be happier in another relationship.” “I always try to keep my relational options open.”, “I don’t want to settle for a relationship that is good enough.”). By using this Scale of Relational Maximization the authors showed that the tendency to maximize in relationships was negatively related with satisfaction, commitment, and investment, whereas it was positively associated with quality of alternatives.

Richardson, Ye, Ege, Suh, and Rice (2014) developed a 10-item Refined Maximization Scale (Refined MS), which included 3 factors: *want the best* (e. g., “Even if I see a choice I really like, I have a hard time making the decision if I do not have a chance to check out other possible options.”), *regret* (e. g., “When I think about how I’m doing in life, I often assess opportunities I have passed up”), and *decision difficulty*. The first factor was positively correlated with happiness and life satisfaction, whereas it was negatively correlated with depression. The second one was positively associated with depression and negatively related with happiness and life satisfaction. The decision difficulty factor resulted to be uncorrelated with any of these three well-being measures. By using their scale, the authors showed that there is not gender difference in the tendency to maximize, contrary to other studies that showed a higher tendency for men, as compared to women (Iyengar, Wells, & Schwartz, 2006; Parker, Bruine de Bruin, & Fischhoff, 2007).

Dalal, Diab, Zhu, and Hwang (2015) compared the MS and the MTS, finding the latter more psychometrically valid than the former. The authors also proposed a reduced version of the MTS by retaining only 7 items from the original 9 item-MTS (MTS-7). All the items reflected the high standards factor. By using the MTS-7, maximizing resulted unrelated to negative indices of well-being.

More recently, Misuraca, Faraci, Gangemi, Carmeci, and Miceli, (2015) developed the Decision Making Tendency Inventory (DMTI). This scale consists of 29 items: 11 items measure the maximizing tendency (e.g., “In studying or working, I always set the highest targets.”); 8 items measure the satisficing tendency (e.g., “In every area, I try to achieve results that are satisfactory for me.”); 10 items measure the

minimizing tendency, a further decision making construct consisting in the tendency to minimize the amount of resources in order to get the minimum of the possible results (e.g., “I always set targets to be achieved with minimal effort.”). The above tendencies were explored across different decision making situations (professional, academic, and consumer) and resulted domain-independent, providing confirmation to the untested assumption in the literature according to which some individuals habitually adopt a maximizing behaviour whereas others habitually adopt a satisficing behaviour across a wide range of decision tasks (Schwartz et al., 2002). Compared to the previous scale, the most interesting contribution of the DMTI is the finding that the maximizing and the satisficing construct appeared to be broken in two independent facets. It seems that there are two distinct types of maximizers and two types of satisficers. Building on the characteristic associated to each of these facets, the authors labelled the maximizing facets as the *resolute maximizers* and the *fearful maximizers*. While the former seem to have a clear idea of which goals to achieve and meticulously process a large amount of information in order to achieve their goals with both persistence and tenacity, the latter tend to process a huge amount of information out of a need of meticulousness and desire for order, without necessarily having a clear idea of the goals to achieve. Furthermore, the facet ‘*resolute maximizers*’ resulted unrelated with regret, self-esteem, depression, optimism, and satisfaction with life suggesting that these maximizers are not associated with negative indices of well-being and that when they decide they do not regret their choices. On the contrary, the facet ‘*fearful maximizers*’ resulted associated with low levels of self-esteem, optimism, life satisfaction, and with high levels of depression, and regret. These maximizers, thus, seem to approach their decisions with a fear of making

wrong decisions and high expectations that lead them to regret their choices. Concerning the satisficing construct, its two independent facets were labelled as the *more ambitious satisficers* and the *less ambitious satisficers*. The first ones have higher standards compared to the second ones. The two satisficer types, thus, seem to adopt different stopping rules: while the first kind put more time and make more comparisons in order to find an option that satisfies their higher standards, the second kind tend to avoid putting too much time and resources into their search. None of these satisficing facets resulted correlated with indices of well-being, thus it is still unclear which of these two types is happier.

The latest scale proposed is an adaptation of the scale of relational maximization to the domain of friendships (Scale of Friendship Maximization, FMS, Newman, Schug, Yuki, Yamada, & Nezelek, 2017). This scale has 16 items, such as: “I often wonder if I would be happier spending time with other friends.”; “Finding friends is difficult because I want to choose the perfect friends for me.”; “I know what I want in friendships and I won’t compromise.” Although the most recent, it still revolves around the items and 3 sub-constructs of decision difficulty, alternative search and high standards which the above scales had dismissed or contested. By using this scale, the tendency to maximize outcomes in selecting friends was negatively related to well-being.

3. Tell me which scale you use and I tell you who’s happier and has best outcomes

There has been substantial psychological research comparing perceptions, feelings and outcomes of maximizers versus satisficers. The majority of this empirical work – even the most recent Newman et al. (2017) - has used or was inspired by the first MS, despite the fact that the very authors of the original MS have later revised it. The

purpose of this section is not to provide an exhaustive overview of this literature, but to relate the findings to the scale used. By and large studies using the MS, or any scale which includes Decision Difficulty as a sub-construct, find that satisficers have better outcomes than maximizers. Studies which instead use the MTS (which has no Decision Difficulty factor) find that maximizers are graced with better outcomes and well-being. For example, a body of research explored the relationship between maximizing (measured with MS) and the achievement of positive (versus negative) outcomes. In the context of job search, Iyengar, Wells, and Schwartz (2006) compared the outcomes of a group of maximizer college students during their final semester of school with the outcomes of the job search of a group of satisficers students. The results showed that maximizers were less happy than satisficers, but their decision making process yielded objectively better results than satisficers, selecting jobs with 20% higher salaries.

Other investigations using the original MS showed that maximizers perform worse than satisficers in some judgment decision making tasks. For example, Bruine de Bruin, Parker, and Fischhoff (2007) found that maximizers have lower scores than satisficers on the Adult Decision-Making Competence, which is a measure to assess how well individuals make decisions. Similarly, Parker, Bruine de Bruin, and Fishhoff (2007) showed that a higher tendency towards maximization, measured again by the Schwartz et al.'s scale (2002), is associated with a greater tendency to report maladaptive decision making styles, such as less behavioural coping, greater tendency to depend on others for their decisions, more avoidance of decision making, and more post-choice regret. Polman (2010) found that a higher tendency towards maximization (measured by the MS) is simultaneously positively associated with positive and negative outcomes. In this study,

maximizers seek and choose more positive options (good decks) as well as more negative options (bad decks) than satisficers when playing the Iowa Gambling Task (Bechara, Damasio, Damasio, & Anderson, 1994). The experience of more negative outcomes explains why maximizers are less happy than satisficers.

Other work investigated the propensity of maximizers to change their decisions, as a consequence of their strong regret and their desire to achieve the best of the possible results. Chowdhury, Ratneshwar, and Mohanty (2009) observed the maximizing behaviour (measured as MS) in a context of online gift purchases made under a time constraint. The authors found that maximizers changed their choices more often than satisficers, when given the opportunity to do so. Lai (2011) found that maximizers (measured by the same author's scale) were more prone than satisficers to switch between service providers (television providers). In other words, maximizers appeared to be less loyal than satisficers. In line with this result, Shiner (2015), by using the MS ~~scale~~, showed that maximizers are more satisfied after making a reversible decision, whereas satisficers are more satisfied after making a decision that cannot be changed.

Other studies explored the way in which maximizers evaluate and respond to feasibility and desirability information. Feasibility refers to the difficulty of obtaining an outcome, whereas desirability refers to the benefit derived from an outcome. For example, a trip to a very far beautiful destination is high in desirability but low in feasibility (Liberman & Trope, 1998). It has been shown that maximizers, measured by the original 13 item MS (Schwartz et al., 2002), focus more on desirability than feasibility aspects (Hsieh, Yalch, & Love, 2015) and thus prefer options that are highly

desirable even if they are low in feasibility. Consistently, maximizers are also persuaded more by advertisements highlighting the desirability of a product rather than its feasibility.

Authors such as Parker et al. (2007), Tanius Wood, Hanoch, and Rice (2009) and Bruine de Bruin, Parker, and Strough (2016), examined the relationship between maximizing and adult age by using Schwartz et al. (2002) 13 item MS. Some of these authors found no significant correlation (Parker et al., 2007), while others found lower maximizing tendencies in older adults compared to younger adults (Tanius et al., 2009; Bruine de Bruin et al. 2016). These latter results align well with studies showing a higher satisfaction of seniors compared to younger adults after choosing from an overabundance of options (see Misuraca, Teuscher, & Faraci, 2016).

A cross-cultural investigation of the effects of maximizing (as measured by MS) on well-being showed that maximizers report less well-being than satisficers in societies that place more emphasis on choice as the way to happiness, such as U.S. and Western Europe, but not in societies, such as China, where the exposure to choice abundance is less valued (Roets, Schwartz, & Guan, 2012). In these latter societies, indeed, maximizing resulted unrelated to well-being.

Another set of research investigated the tendency of maximizers towards social comparison, finding that maximizers (measured by the original MS by Schwartz et al., 2002) tend, more than satisficers, to engage in social comparison, especially upward (Schwartz et al., 2002; Polman 2010). In line with this result, by using the 13 item MS, Huang and Zeelenberg (2012) showed that maximizers are particularly regretful and unhappy when they find out that others chose better than them, even though the outcome of their own choices was better than expected. It seems also that maximizers (measured

with the 13 item MS) choose differently if their choices are public rather than private (Lin, 2015) and that their main motivation is not only to choose the best. They actually want to be the best! (Weaver, Daniloski, Schwarz, & Cottone, 2015). Using the MS-inspired scale of maximization in the domain of friendships, Newman et al. (2017) expectedly found that people who score higher on the maximization in friendships scale feel less satisfied, less positive, more regretful, and have less self-esteem, than those being less maximizer in friendships.

Recent research considers maximizing as a mind-set. In order to induce the maximizing mind-set the authors used self-produced techniques and a manipulation of the original scale by Schwartz et al. (2002). The common elements underlying these techniques were that they all induced the tendency to compare a large number of alternatives and to attempt to choose the best. Their findings showed that the maximizing mind-set amplifies regret and dissatisfaction across domains, and increases the probability of returning products. For example, Levav, Reinholz, and Lin (2012) demonstrated that smaller initial choice-sets (i.e., music selections) placed in increasing sequences induce the maximizing mind-set (i.e., more sampling and longer time to make a decision). Once activated, this mind-set has carryover effects in other, subsequent, unrelated tasks (see also Mogilner, Shiv, & Iyengar, 2013). Similarly, Ma and Roesse (2014) showed that the maximizing mind-set can be activated in one domain (i.e., a non-consumption domain) and produces carryover effects in another domain (i.e., a consumption domain).

Other research focussed on maximizers' time perception. A study by Misuraca and Teuscher (2013) showed that maximizers (measured by the MS) tend to under-

estimate time passing while choosing, probably as a consequence of their high cognitive workload. Also using the MS, Chowdhury et al. (2009) found that maximizers perceive significantly more decision time pressure than satisficers for the same time-constrained decision scenario. Still using the MS, Carrillat, Ladik, and Legoux (2011) demonstrated that maximizers do not learn lessons from their previous experiences since they would reconsider their regretful options again in a future decision scenario (the “Sisyphus effect”). Besharat, Ladik, and Carrillat (2014) found a negative association between maximizing and consideration of the future. Given their goal of making the best choice, maximizers are, indeed, totally immersed in present decisions. This focus in the present seems to hinder their ability to care for their future. The authors adopted for their study the shortened maximization scale from Nenkov et al. (2008).

However, direct contrary to this latter result, when maximizing was measured by the MTS, (Diab et al., 2008), Misuraca, Teuscher, and Carmeci (2015) found that maximizers are more future oriented, and also have higher numerical skills than satisficers. Maximizing (measured by MTS) was also significantly correlated to confidence in real-world predictions, such as the outcomes of the 2010 FIFA World Cup (Jain, Bearden, and Filipowicz, 2011), and correlated to eudaimonic well-being, that is the happiness derived from fulfilling one’s purpose and best potential (Kokkoris, 2016). In sum, when the maximizers’ happiness is measured with the MTS, they fare generally better than when measured by the MS.

4. A “First Scale Published” bias?

Although so much methodological research over the past 9 years (Nenkov et al., 2008, Diab et al., 2008, Lai, 2010, Rim et al., 2011, Turner et al., 2012, Weinhardt et al.,

2012, Richardson et al., 2014, Dalal et al., 2015, Misuraca et al., 2015) has clearly demonstrated that the original MS (Schwartz et al., 2002) is not adequate to measure the maximizing tendency and that other scales have better psychometric properties than the MS, the original 13 item MS for their investigations continues to be utilized heavily and even appears in the most recent publications.

Studies which are inspired by the MS but were published after the finding that the MS is not a good measure of maximizing was published include Chowdhury et al. (2009), Tanius et al. (2009), Polman (2010), Carrillat et al. (2011), Huang et al. (2012), Roets et al. (2012), Misuraca and Teuscher (2013), Ma and Roese (2014), Hsieh et al. (2015), Lin (2015), Shiner (2015), Weaver et al. (2015), Bruine de Bruin et al. (2016) and most recently, Newman et al. (2017). While it is understandable that studies published shortly after 2008 might report the MS because they began before the publication of alternative maximization scales, the use by later papers is more problematic, showing a disconnection between methodological advancement and empirical experimentation. This is unfortunate, as it weakens its potential to inform future research and reliable applications. A reason for the popularity of the first scale might be heuristic processing on the part of researchers: The MS was the first scale published and discussed in the media and research – a ‘default’ which is hard to dispense with.

5. What does a Maximizer scale measure?

The literature to date treating the impact on happiness and wellbeing of being a maximizer rather than a satisficer appears confused and fragmented. Different definitions of maximization have been adopted by different authors, different scales and subscales have been proposed to measure it, and different findings were subsequently observed.

The literature review here indicates both a need for conceptual clarity and a need to adopt caution when drawing conclusions about maximizing.

Concerning the conceptual clarity, the proliferation over time of several maximizing scales, instead of making the concept simpler, has made the construct of maximizing more and more confused. When examined closely, the items of each scale define the construct of maximization differently with the consequence that, after more than a decade of studies, it is unclear what it means to be a maximizer. Are maximizers decision makers who seek for high standards? Who experience decision difficulty? Who endlessly compare among alternatives? Are maximizers individuals who are high on just one of these dimensions or on all of them? Are they individuals who get bad outcomes, and have negative indices of well-being or are they individuals who obtain good outcomes, and are associated with positive functioning and well-being? Until a more precise and univocal conceptual definition is offered, all measurements and findings will be unclear and lack consistency.

The empirical research reviewed in this article highlights also the need to consider methodological issues when conducting or interpreting studies on maximizing. We make readers aware that any findings strongly depend on the specific scale used to measure maximizing. For instance, and not surprisingly, adding 'decision difficulty' to the maximizing construct tips the scale of happiness in favour of satisficers. Any conclusion, thus, about the maximizing construct needs to be drawn after a clear definition and measurement of the construct of interest.

6. The methodological solution proposed by Giacobelli et al. (2013): Multiple scales

Giacopelli, Simpson, Dalal, Randolph, and Holland (2013) were the first to extend research on maximizing to the organizational domain - and explored the usefulness of the maximizing construct as a predictor of job satisfaction, intentions to quit, in-role task performance, and annual income. Importantly, in conducting their research, the authors were sensitive to the fact that empirical findings significantly change as a function of the specific scale used to measure the maximizing construct. They thus used three different scales to measure participants' tendency towards maximization: Schwartz et al.'s (2002) original MS, Diab et al.'s (2008) MTS, and the 6-item short form of the MS recommended by Nenkov et al. (2008). As they expected, their findings showed different associations depending on the scale used to measure maximizing. In particular, when the original MS was used, maximizing was found to be negatively related to job satisfaction and in-role performance, and positively related to intentions to quit. When the MTS was used, maximizing was found to be positively related to job satisfaction and in-role performance, and negatively related to intentions to quit.

Maximizing and annual income were found to be unrelated when the MS was used, and positively related when the MTS was used. Regarding the Nenkov et al.'s scale, the authors found that decision difficulty and (to a lesser extent) alternative-search operated similarly to the MS. Both dimensions were indeed negatively correlated with job satisfaction and in-role performance, whereas they were positively associated with intentions to quit. Both dimensions resulted to be uncorrelated with annual income. High standards, instead, was found to operate in a similar way to the MTS. It was, indeed, positively correlated with job satisfaction, in-role performance and annual income,

whereas it was negatively correlated with intentions to quit. The authors found that maximizing was not a strong predictor of satisfaction and performance, compared to other constructs commonly used in organizational settings, such as core self-evaluations (CSE, Judge & Bono, 2001) and conscientiousness (Judge, Heller, & Mount, 2002).

6.1. Evaluation of Giacopelli et al.'s (2013) solution

Giacopelli et al. (2013) drew a pessimistic conclusion from their research: maximizing is not a key predictor of happiness compared to other criteria such as core self-evaluations and conscientiousness – and thus how maximization is measured is not so important, or as important as other scales.

This pessimistic conclusion might be true for the organizational setting Giacopelli et al. (2013) considered; however, we have greater faith than Giacopelli et al. (2013) in the ability to measure differences in search behaviour and use them to improve decision makers' well-being. To solve the confusion we propose that a theoretical solution is necessary.

7. The theoretical solution proposed by Cheek and Schwartz (2016): Two-component model.

Cheek and Schwartz (2016) highlighted the same need for clarity in a recent review paper. Just like us, the authors pointed out that research on maximizing is becoming extremely confused because of the proliferation of too many scales, each measuring a different concept of maximizing. To provide clarity, Cheek and Schwartz (2016) proposed a new conceptualization of maximizing and satisficing.

With regard to maximizing, they propose a two-component model, according to which maximization consists in the *goal* of choosing the *best* option by using the *strategy*

of alternative search. According to the authors, only two components of maximization exist: The *goal* (to choose the best) and the *strategy* (alternative search). All the other previously considered dimensions of the maximizing construct, such as regret and decision difficulty, are just outcomes or antecedents, rather than components, and consequently, they should not be included in the measurement of maximizing. Based on their model, Cheek and Schwartz suggest to use the MTS-7 (Dalal et al., 2015) as measurement of the maximization goal, and the alternative search scale of the MI (Turner et al., 2012) for the measurement of the maximization strategy. However, as Cheek and Schwartz pointed out, this latter scale contains at least three items that do not reflect the alternative search behaviour (e.g., “When I see something that I want, I always try to find the best deal before purchasing it”; “I usually continue to search for an item until it reaches my expectations”; “I just won’t make a decision until I am comfortable with the process”). Cheek and Schwartz thus conclude calling for future research on the measurement of the alternative search strategy.

With regard to satisficing, Cheek and Schwartz suggest to use the DMTI’s less ambitious satisficing scale (Misuraca et al., 2015) because it well reflects the tendency to select the first option that meets one’s standards. Here, too, the authors conclude by calling for future research to better define and measure the satisficing construct.

7.1. Evaluation of Cheek & Schwartz’ solution.

Although remarkable as an attempt to summarize and provide a framework for the confused literature and future research, Cheek and Schwartz’ proposal highlights yet more unresolved issues, rather than offering a conclusive solution.

With regard to maximizing, the questions that their review poses have to do with the concepts of alternative search, high standards, and stopping rule.

Firstly, the designation of alternative search strategy as the only strategy of a maximizer seems unrealistic for the digital era we live in. Nine out of ten American adults use the Internet and social media daily (e.g., Pew Research Centre, 2015). With such high use, choice of the best option available could follow a very different search strategy, like observing choices that experts or others with similar views have made (Lamberton et al., 2012), or consulting online *Consumer Reports*. They could also base their decision on online ranks (i.e., searching for an hotel, someone could decide to pick the best ranked hotel of a vacation destination). These are only a few examples of potential ways to seek the best without consuming cognitive and time resources in an endless comparison of every single option. As indicated by Misuraca et al. (2015) this type of search is consistent with a facet of maximizers - the fearful maximizer. However, strictly applying the model of Cheek and Schwartz, a decision-maker who chooses the best after consulting a consumer report would not be considered a maximizer at all.

Secondly, according to Cheek and Schwartz the key distinction between a maximizer and a satisficer is no longer high standards², but the stopping rule: “satisficers will stop searching once their standards –however high they may be- are met, whereas maximizers may continue searching for a better option even after they have found one that would potentially meet their standards” (Cheek & Schwartz, 2016, p.136). It is not entirely clear if according to their definition, maximizers or satisficers are more likely to

² This is in conflict with the original MS (Schwartz et al., 2002) and with the Shortned Maximization Scale (Nenkov et al., 2008), developed by Schwartz, where High Standards was a component of maximizing, with Decision Difficulty, and Alternative Search.

accept a sub-optimal option, nor who is expected to have higher standards. As the authors stated, indeed, “... *it may often be impossible for maximizers to identify, much less choose, the best option ..., but we emphasize that they have the goal of choosing the best, even if this is impossible and they eventually choose a sub-optimal alternative.*” (Cheek & Schwartz, 2016, p. 136, note 7). Concerning high standards, the authors stated: “... *a satisficer could have higher standards than a maximizer. Suppose the satisficer wants to get at least \$500,000 for the house whereas the maximizer wants the highest (i.e., best) offer. The best offer that comes in is for \$475,000. The maximizer sells the house and the satisficer takes it off the market*” (Cheek & Schwartz, 2016, pp. 135-136).

If a satisficer sets a higher acceptability threshold than a maximizer, and stops only when s/he encounters an option that meets this threshold, satisficing would, according to Cheek and Schwartz, require more time and effort than the search of a “maximizer” who evaluates all options available and then picks the highest one, according to lower standards. The fact that high standards are not a requisite for maximization and that satisficers can have higher standards than maximizers, appear in contrast with the theoretical conceptualization originally proposed by Simon, according to which maximizers’ goal is the absolute best. Furthermore, this example of a satisficer who attains a better outcome than a maximizer (imagine both want to sell a \$500,000 house, a satisficer finding a buyer who pays \$500,000 and a maximizer receiving the highest offer of \$350,000), creates confusion and contradicts findings showing that maximizers get better outcomes than satisficers (see for example, Iyengar, Wells, & Schwartz, 2006). In agreement with Simon’s original definition, and previous literature, we propose that pursuit of the highest standards is a key factor that characterises maximizers. Maximizers

do not have ‘thresholds’ and satisficer’s standards can be high and ambitious but their thresholds are not higher than those of a maximizer (see also Misuraca et al., 2015).

8. What about searching with tools?

Another important issue with the maximizing construct discussed and measured to date is its anachronism. There seems to be a mismatch between the search tools that are assumed to be used by decision makers and those that are actually used by decision makers today. Simon was a visionary and a polymath, but lived 70 years ago. His conceptualization was developed when decision-making was not influenced by technology. Over the last fifty years, technology has deeply and permanently changed the way we get information and make decisions. While in the past decision-makers typically spent a huge amount of time to get information about potential options and their characteristics, physically going to see and touch the choice options, nowadays, given the overabundance of options and information, it became unrealistic to experience everything before deciding. We, instead, choose holiday destinations, dates, and education based on social media and online searches. Optimal decisions can happen in a *micro-moment* simply by accessing the right app (e.g., Facebook). It has been estimated that users access their smartphones about 150 times a day, for a total of 3 hours and 15 minutes per day, of which the majority is on apps (eMarketer, 2017). During these hundreds of tiny moments, users make any kind of informed decision, faster than ever before. Considering the technological changes and new characteristics of our decision environments, prior theories on maximization need to be revised in order to reflect this evolution. Currently, the scales available are unable to describe the search behaviour of decision makers

navigating the digital world with tools of the 21st century. None of the existent scales includes items that refer to digital search strategies and tools. Even the most recent review on maximizing (Cheek and Schwartz, 2016) does not mention at all the need to include in a new conceptualization of the construct the use of modern online search tools to achieve the best.

Designing a maximizing scale around search with the reliance on online tools or other modern search strategies is fundamental to increase the relevance of the construct. In the last section we advocate for a revision of the components of maximizing and satisficing such that they become useful in measuring search in the current digital information age.

We propose, as a core new component of maximization, the *use of decision tools* (e.g., apps, websites, online calculators, decision tables, reviews from other users or experts, online product demonstrations, feature comparison charts, and so on) as strategy to achieve the goal of choosing the best (e.g., Anderson & Misuraca, 2017). As Simonson and Rosen (2014) stated, thanks to these tools, today's decision makers make better decisions and act more rationally than when they started their career. For example, it has been observed that consumers relying on online consumer reviews, feature comparison charts, and other online tools, are no longer biased in favour of the middle option, making the well known compromise effect disappear (Simonson & Rosen, 2014). As for the compromise effect, many other irrational effects do not replicate when consumers use online search tools. This is because online tools give easy access to nearly perfect information about the quality of the products and services to choose from and makes it easier to select the best. Compared to search tools that existed previously (such as printed

versions of Consumer Reports), online search tools not only improve the probability to find a detailed answer to one's question, but also considerably reduce the amount of time spent to get that answer (see Chen, Jeon, & Kim, 2013). Just like in the pre-app era (Edwards & Fasolo, 2001), some of the apps and tools currently available are designed to facilitate a compensatory maximising-type of search (e.g., the Tinder app for relationships) rather than more of a satisficer-type of search (e.g., Coffee and Bagels, again for relationships).

The value of apps like Tinder is to boost and stimulate maximizing behaviour even in people with lower memory, pressed for time, and freeing from the difficulty of holding the comparison of the alternatives in one's mind. The use of these tools needs to be incorporated in the maximizing strategies identified in previous literature.

9. Stop the proliferation, and agree on the meaning

While the two-component model by Cheek and Schwartz (2016) provides indication about which scales are more appropriate to use so far and calls for new scales to better measure maximizing according to their new definition of maximizing, we here propose a different solution: stop the proliferation of new scales and agree first on the meaning. It is really important that we stop the proliferation of new scales, and focus instead first on a jointly shared meaning of maximization. Until this is done, new scales will only further increase the confusion of the findings and of the core construct. With this aim, the 'best choice' might be a research contest, or a workshop, where all the minds which have contributed to the methodological advancement revise and accept a single definition of maximization.

We sketch an agenda for such workshop, with possible directions towards a better definition and, thus, measures of maximizing. Firstly, we encourage a discussion about the meaning of ‘seeking for the best’. What exactly is ‘the best’? Is the best only something objectively measurable (i.e., the most lucrative financial investment, the highest offer for a house) or it is also something subjectively evaluated (i.e., the best dress to wear at the Christmas party, the best partner to pick from a dating website)? In other words, is maximizing referred only to contexts where an ‘objective best’ exists, or it extends also to decision situations where ‘subjective evaluations’ are viable? In this latter case, a more precise distinction between maximizing and satisficing is also required. Secondly, we encourage the discussion on the potential pathways through which an individual can reach the best. The literature seems to assume that maximizers use a compensatory approach, based on the systematic comparison of all the available options based on description. However, (i) this claim is not accompanied by evidence; (ii) other ways of optimization can be hypothesized. Decision makers who seek for the best could, indeed, ask people (i.e., their closest friends, their family members) who made the same decision or to an expert or to Google. They could also base their decision on simple ranks provided by others (i.e., moving in a new city, someone could decide to enrol his/her kids in the best ranked elementary school of the city without engaging in the complex process of engineering how the rank was computed). There are a multitude of search strategies who could be adopted by “maximizers” searching for the best, waiting to be researched. In particular, we encourage to modernize and to adjust the construct and the following measurement, to our digital Era. When modernizing the construct of maximizing (and satisficing) it is important also to ponder about how maximizers and

satisficers differ in their use of digital tools to make decisions. In our previous example, a maximizer using an online ranking, picks school number one, while a satisficer using the same online ranking, picks a satisfying school considering his/her specific needs, even though the school is not number one in the list. This view would reflect the idea that maximizers and satisficers differ in their goal. However, another scenario can be hypothesized: a satisficer could just pick school number one in the list while a maximizer might still look at other information in an endless comparison among alternatives. This view would reflect the definition that maximizers and satisficers differ in their search strategy. These two plausible scenarios about which one would be a maximizer versus a satisficer reflect well the confusion in the literature and the need to better define these decision behaviors in specific online contexts.

Thirdly, it is important to acknowledge the goals motivating a person to maximize. For example, are maximizers strongly motivated by the goal to choose the best (i.e., approaching behaviour) or by a fear to make wrong decisions and feel inferior to others (i.e., avoidance behaviour)? The two are similar processes but with different goals and would very likely be correlated with different thinking, feelings and perceptions.

We, also, call for a “balanced” approach in defining the construct, developing scales and conducting research on maximizing. It seems that there is a general anti-maximizer bias in most of the available literature – results are framed in terms of the “vices” of maximizing (e.g., high decision difficulty, regret, and dissatisfaction) rather than or more than the “virtues” (e.g., ample feedback after extensive option search). The flipside of this is a spotlight on the virtues of satisficing (e.g., quick search, greater

individual well-being and happiness) over its vices (e.g., little opportunity to learn from feedback). Maximizers would not engage in that behaviour if they had no pay-offs, and a search of these payoffs is an interesting future direction.

Lastly, we encourage to lift the focus of research from small consumer choices to more consequential choices. As satisficing has been advocated as a tool of choice architecture, it is important that such a recommendation is based on research comparing maximizers and satisficers making decisions that have implications for societal well-being and decisions involving others, e.g. retirement, or personal health. As behavioural science is becoming more and more employed in policy and managerial contexts, so our scales need to support this use, with more consequential and complex choice domains, like those of medical, education or financial choice. We expect new important, and perhaps counter-intuitive, findings as we delve into these new research territories.

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Scales	Authors	Number of Items	Number of constructs for Max Construct	N constructs for Sat Construct	Satisficers, as measured by this scale, have better outcomes
MS	Schwartz et al. (2002)	13	1	0, Sat is opposite of Max	1
MS-6	Nenkov et al. (2008)	6	3	0	1
MTS	Diab et al. (2008)	9	1	0	0
MMS	Lai (2010)	5	1	0	0
MI	Turner et al. (2012)	34	2	1	1
Revised MS	Weinhardt et al. (2012)	8	3	0	1
Revised-MTS	Weinhardt et al. (2012)	6	1	0	1
Relational MS	Mikkelsen & Pauley (2013)	15	1	0	1
Refined MS	Richardson et al. (2014)	10	3	0	1
MTS-7	Dalal et al. (2015)	7	1	0	1
DMTI	Misuraca et al. (2015)	29	2	2	?
FMS	Newman et al. (2017)	16	3	0	1

Table 1 – Summary of Maximizing-Satisficing scales evolved in the last 15 years.

Scales	Authors	Findings
MS	Schwartz et al. (2002)	Maximizers experience less life satisfaction, happiness, optimism, and self-esteem than satisficers. They experience more regret, depression, and tendency towards perfectionism than satisficers. Men have a higher tendency to maximize than women.
MS-6	Nenkov et al. (2008)	Alternative search, decision difficulty and high standards are positively correlated with regret. Decision difficulty and alternative search are negatively correlated with happiness and optimism, and positively correlated with depression. The high standard factor is not correlated to any of these three variables.
MTS	Diab et al. (2008)	Maximizers are happier than satisficers. Maximizing is not correlated with life dissatisfaction or with maladaptive style. It is positively related to regret.
MMS	Lai (2010)	Maximizing is positively correlated with optimism, need for cognition, desire for consistency, risk aversion, intrinsic motivation, self-efficacy and perceived workload. It is unrelated with regret.
MI	Turner et al. (2012)	Decision difficulty is negatively correlated with optimism, self-efficacy, and self-regard, and with adaptive decision making styles. Alternative search is uncorrelated with any of the well-being indices and negatively correlated with adaptive decision making style. Satisficing is positively correlated with most of the well-being and functioning indices (e.g., happiness, optimism, self-efficacy, self-regard), good mental health, as well as adaptive decision making.
Revised MS	Weinhardt et al. (2012)	AS is positively related with neuroticism, avoidance, regret, and indecisiveness. It is negatively related with need for cognition. It is unrelated with happiness, optimism, satisfaction, and depression. DD is positively related with neuroticism, regret, depression, avoidance, and indecisiveness, whereas it is negatively related with happiness, satisfaction, optimism, and need for cognition. HS is positively related with happiness, optimism, life satisfaction, and need for cognition, whereas it is negatively related to neuroticism, depression, indecisiveness, and avoidance. It is unrelated to regret.
Revised MTS	Weinhardt et al. (2012)	The MTS is negatively related to neuroticism, depression, indecisiveness, and avoidance, while it is unrelated to regret. Maximizers are not unhappy. They are distressed while making decisions.
Relationa l MS	Mikkelsen & Pauley (2013)	Maximizing is positively associated with quality of alternatives and negatively related with satisfaction, commitment, and investment.

Refined MS	Richardson et al. (2014)	Want the best is positively correlated with happiness and life satisfaction, whereas it is negatively correlated with depression. Regret is positively associated with depression and negatively related with happiness and life satisfaction. Decision difficulty is uncorrelated with any of these three well-being measures. There is not gender difference in the tendency to maximize.
MTS-7	Dalal et al. (2015)	Maximizing is unrelated with negative indices of well-being.
DMTI	Misuraca et al. (2015)	The facet ' <i>resolute maximizers</i> ' is unrelated with regret, self-esteem, depression, optimism, and satisfaction with life. The facet ' <i>fearful maximizers</i> ' is positively correlated with low levels of self-esteem, optimism, life satisfaction, and with high levels of depression, and regret. Satisficing is unrelated with the above indices of well-being.
FMS	Newman et al. (2017)	Alternative Search and Decision Difficulty are negatively correlated with satisfaction with life, self-esteem, and positive affect. They are positively correlated with regret and negative affect. High Standards is positively correlated with satisfaction with life and positive affect, whereas it is unrelated to regret, self-esteem, and negative affect.

Table 2 – Conflicting results among scales.