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Not All Variety is Created Equal: The Effects of Simultaneous and Sequential Choice Situations on the Value of Variety

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Abstract

College admissions, a process that thousands of students undergo each year, involves great administrative and human resources. This process has only been investigated in terms of affirmative action, discrimination, correlates for admissions, and the creation of linear systems for prediction. This research applies the decision making under uncertainty framework to this high-involvement, expert decision. Through simulating an actual college admissions process, studies uncover evidence of a variety seeking bias caused by the arbitrary bracketing based on geographic origin. Due to this need for variety, low quality candidates experience a boost in their rankings, relative to an unbracketed condition. A new dependant measure is used, namely the relative value placed upon variety as a characteristic of a candidate. Policy implications are discussed and areas of future research outlined.

Introduction

The world of college admissions is murky and confusing. Students applying to selective schools face a daunting task, and many highly-qualified candidates are left disappointed with the results. Intuitively, it seems a near-to-impossible task to manually differentiate and choose between hundreds of similar candidates. While this process affects thousands of people each year, we do not know what effect the human decision maker has upon the results. The psychological and cognitive processes behind this high-involvement, expert decision have not previously been studied.

Much media and academic attention has been recently been placed on the role of diversity in college admissions (Sireci 2003, Brown et al 2000). Though the implications of affirmative action and other such policies are beyond the scope of this paper, the importance of diversity, or variety, is relevant. The college admissions process highly values variety, looking for candidates that are unique and special. Decision makers attempt to admit one candidate from each state, assemble complete sports teams, and encompass all cultural backgrounds. But, apart from this explicit diversity seeking, does the process of college admissions introduce an element of variety that is implicit and perhaps undesirable?

The current methodology of the college admissions process includes bracketing candidates based on geographic origin. There is no explicit reason for the choice of this factor, and it is employed mainly for administrative purposes. This process of bracketing involves evaluation of candidates in each cluster as a group. Previous research has found systematic biases that occur because of the bracketing of a decision (Tversky and Kahneman 1981, Redelmeier and Tversky 1992, Read et all 1994). A result of

bracketing is that the bias to value variety of region is magnified. In particular, variety becomes such an important part of the situation that quality of the choices is sacrificed. If bracketing does make a difference in this process, amplifying a factor that is not explicitly desired, then it would lead to a set of candidates being chosen partially due to a bias that is left unaccounted for.

The idea of the impact of bracketing is already understood by those involved in the college admissions process. Intuitively, one knows that a superior student applying from a high school with less competitive candidates is believed to have a higher chance of admission than if he or she was graduating from an East Coast preparatory high school. Thus, it seems that being an exceptional student is not the only characteristic of a successful candidate. Because of the nature of the process, one must be compared to others in a bracket and "stand out" from among that particular group. Why should one candidate have a higher chance of admission simply because they went to a particular high school, or, more generally, if they belong to a particular, arbitrary bracket? Not only do already successful candidates suffer from this bracketing, but the variety seeking bias also seems to help underqualified candidates. With a special, variety seeking characteristic, can a lower quality candidate gain admission into a selective school simply due to the bracketing of the decision process? Why is variety valued differently?

This paper is driven by the need to research the college admissions process further. This important type of decision is complex and impacting, yet not well understood. Ideally this process should be fair, admitting candidates based on systematic and rational reasons. The choice set should be composed on the best possible candidates given the explicit factors that are regarded to be important. Because of the high quality

of many of these candidates, there is no one best global set, but a variety of sets that would be equally strong. Much of the previous research has focused on finding factors that predict college success to be used as explicit factors. As early as 1932, Bixler modeled college grade point averages with high school marks and aptitude test score. More recently, the use of standardized exams and general intelligence tests as accurate measures of candidate quality has been questioned (Wightman 2000, Ceci 2000, and Everson 2000). Variety based on these correlates is explicit and desired, but the question at hand is if variety based on region is also explicitly desired.

Seeking to make the admissions process fairer, researchers have attempted to create normative decision aids through the use of linear programming. Edwards and Bader (1988) designed an expert system that modeled the decision of college admissions using several variables. With these mathematical tools, they were able to create a system that achieved up to 96% agreement with the actual decision of a trained admissions officer focusing only on quantitative variables. Finlay and King (1989) also developed an expert system for MBA admission, expanding upon the ideas of Edwards and Bader. They explain that "success in the admissions cases was achieved by developing a simple mathematical model to represent the experts' judgment" (634). While these systems seem to achieve a high level of validity, one is led to question if and how they take into account the impact of the human decision maker in the actual admissions process. More recently, researchers have looked at biases in admissions, but only in the context of gender and racial preference (Attiyeh 1996). The past forty years of decision research have proven that inherent biases occur throughout the human decision making process, and college admissions is one such process (Kahneman 1982, Kahneman and Tversky

2000 (Choices, Values, Frames and Heuristics and Biases under Uncertainty). Because of the implications of this decision, it is time to explore the college admissions process using the same scientific rigor as has been applied to other types of decisions.

The scope of this paper goes beyond that of exploring the college admissions process per se. More generally, it seeks to understand the variety seeking bias in high-involvement, expert decisions. Previous research has focused on variety seeking in low-involvment, novice situations, employing products in the entertainment and nondurables categories. It is valuable to apply the numerous findings of variety seeking to new contexts in order to better understand the bias itself. In addition, this paper uses a new dependant measure of variety, namely the relative value placed upon it. Previous research has focused on measuring the amount of variety, but this paper attempts to measure the value placed upon variety as a function of the decision situation. In this paper, I will seek to briefly discuss the major relevant findings of the variety seeking research, decompose the college admissions process, and empirically show that biases are in fact present in these decisions. I will begin by focusing on the connection between the variety seeking bias and the effects of the decision situation.

The Variety Seeking Bias

Variety Seeking was first defined as "a stable but unsystematic preference for sampling other stimuli before returning to a given stimulus" (Brickman and D'Amato 1975). Though the majority of the definition is still accepted to be the same, the word "unsystematic" has been questioned in the literature. McAlister and Pessemier expand on the "explicable," or systematic, reasons for varied behavior as opposed to the "inexplicable," or unsystematic (1982). Since then, the research has focused on an array

of systematic causes for this bias including satiation, future preference uncertainty, and the external situation (Kahn 1995).

This paper focuses on variety above and beyond that which is explicitly desired. Thus, once again, any variety such as that of affirmative action is not dealt with. It is important to also note that this is variety across situations but within individuals (Kahn 1995). Thus, while individual differences exist in the need for variety, this paper attempts to find a systematic variety seeking bias within each decision maker.

The Decision Situation

Simonson (1990) first explored the effects of the situation on the level of variety seeking. Sequential decisions are those in which consumption and choice occur together. To model this situation, Simonson asked subjects to purchase a meal for immediate consumption. Simultaneous choices, on the other hand, are those that involve making decisions in advance for multiple consumption situations. For this condition, consumers purchased all the meals for the entire week in one shopping trip. Purely as a result of the situation, Simonson found more variety seeking in the simultaneous choice condition. He attributed this variety seeking to uncertainty about future preferences and a desire to simplify the decision process. Simonson's framework of decision timing has been widely used in the literature, and its terminology will be used throughout this paper.

Read and Loewenstein (1995) further explored the differences between simultaneous and sequential decisions. They define the diversification bias as the increase in variety seeking due to making a combined choice as opposed to a separate choice. In their first paper, they attribute this diversification bias to two mechanisms: time contractions and choice bracketing. The first one, time contraction, is the bias to

"compress time intervals and treat long intervals as if they were short" (p. 34). The implications of this are overpredicting satiation and thus choosing more variety. Because college admission decisions do not involve predictions of future preferences, the time contraction mechanism is less relevant to this paper than the second mechanism, choice bracketing. This is defined as "the tendency to treat choices that are framed together differently than those that are framed apart" (p.34). In their Experiment 4, Read and Loewenstein manipulated the presentation of candy bars to children during Halloween. In the combined, or simultaneous, decision, they used two different candy bars piled on the same tray. In the separated, or sequential, decision, they placed one type of candy at one house and the second type of candy at the neighboring house. As hypothesized, the combined condition resulted in all children choosing one of each of the candy bars, while in the separated condition only 48% chose two different bars. Read and Loewenstein hypothesized that the natural choice tactic of a simultaneous decision is diversification, and the utility of the individual parts of the decision (local utility) is sacrificed for the utility of the entire decision (global utility). Decision makers overestimate the impact of variety on the global utility of their decision, thus choosing too much variety. In the sequential decision, the natural choice tactic is choosing one's most preferred item, thus maximizing local utility. Thus, this paper highlights the negative consequences of simultaneous choices, i.e. one chooses too much variety.

In addition to increasing the variety seeking bias, there are positive consequences to choosing in a simultaneous method. In sequential decisions, not enough variety may be chosen, one cannot make improving sequences, the ability to take risks is diminished, melioration effects are ignored, and trade-offs are unable to be made (Read, Loewenstein,

Rabin 1999). It thus becomes apparent that in simultaneous choice decisions, there is a tradeoff between being able to maximize globally and over-magnifying the variety seeking bias.

Global vs. Local Maximization

The ability to make decisions based on global maximization is a cognitively complex proposition. Being able to make the necessary trade-offs automatically and the complicated calculations in one's mind involves sophistication and effort. Ratner, Kahn, and Kahneman (1999) attempted to find evidence of global or local maximization in a song-choice situation. Interestingly, a discrepancy was found between real-time experience and mental memory representation. While in real-time, listening to less-preferred songs does not increase the enjoyment of more-preferred songs, sequences that incorporated variety were remembered as more enjoyable in retrospective memory. In this type of hedonic experience, it seems that people did in fact globally maximize in order to create more preferred memories. But, in order to do this, they were sacrificing actual utility in choosing less preferred songs over more preferred songs. Thus, there is not only a rational benefit to simultaneous choices, but also a hedonic planning benefit. It is important to note that both of these effects are a combination of conscious and unconscious processes, explicitly and implicitly choosing more variety in exchange for utility.

The College Admissions Process Map

The College Admissions process is complicated and consists of several layers. Each candidate is reviewed by an officer in charge of a specific geographic area who then creates a summary of the applicant featuring both quantitative and qualitative comments.

The current paper focuses on this particular level of the decision making process; an officer is rating candidates and choosing which to present to the rest of the committee. While evaluating the candidates, the officer brackets them by high school, in order to make the process easier cognitively and administratively. This bracketing causes an apparent bias in the evaluation of candidates, which is not accounted for in the admissions process. It may be arbitrary because there is nothing inherently obvious to bracketing by high school or region. In fact, it could also be based on a variety of other attributes such as sport played, instrument played, state residency, etc. If regional diversity was explicitly valued, then the bracketing would be beneficial. But, if the relative weight of region is altered by the introduction of the bracketing, then it is arbitrary and introduces a bias.

College Admissions and the Role of Bracketing

The introduction of this bracketing system creates a simultaneous choice situation within each bracket. Candidates within a bracket are evaluated as a whole group, as opposed to individually. The entire process, the combination of all the brackets, can be viewed as narrow bracketing as it encompasses several decisions made separately. Due to the processes explained above, the simultaneous bracketing leads to a magnification of the variety seeking bias, and this should be present in the admissions process.

> H1: There will be a systematic difference in the evaluation of candidates depending on whether the decision process is bracketed of unbracketed, driven by the fact that bracketing by high school is arbitrary.

This paper addresses the differences that emerge in candidate ratings based purely on seemingly arbitrary bracketing. The relative weighting of variety is hypothesized to

fluctuate as a function of the bracketing, and this systematic bias is not predicted to occur in the sequential choice condition.

> H2: The unbracketed decision process will be the closest approximation to unbiased rankings without systematic biases.

Research has shown that compared to sequential decisions, subjects in simultaneous conditions performed worse in gamble decisions, choosing too much variety and sacrificing expected value. (Read et al 2001). Thus, though not purely rational, outcomes from sequential decisions should be much closer to those predicted by an unbiased decision maker than outcomes from simultaneous decisions. In the process of college admissions, evaluating all candidates at once should yield the ratings that are the most appropriate for each candidate.

The findings from previous research also predict what the nature of the systematic difference between the two decision situations will be. Because of the positive value associated with variety, candidates who have special variety seeking characteristics would be favored. In particular, it is hypothesized that simply because of the bracketing, candidates who are less qualified quantitatively will be rated higher (or more preferred) because they happen to be the variety option of that bracket (Berlyne 1970). This should be especially true when they are bracketed with a group of people who do not have the special characteristic. Thus, a candidate who is low quantitatively should profit from being the only "variety seeking option" of that bracket more than if he is evaluated sequentially. Alternatively, if a candidate is paired with someone who also has the same special characteristic, but better quantitative scores, his rating should decrease relative to the sequential decision. Also, the rating of the higher quality candidate should increase. In that case, having variety in that bracket would actually hurt or help a potential

candidate due to contrast effects (Wedell 1995). Though previous research has focused on low-involvement tasks, the current paper attempts to replicate these findings in a high-involvement judgment task.

> H3: In the bracketed decision process, rankings for candidates with lower quantitative variables will be affected by variety seeking characteristic.
>
> > H3a: If alone in a bracket, this will increase their rankings, relative to the unbracketed condition.
> >
> > H3b: If with another candidate with same VS characteristic, but higher quantitative variables, the candidate will experience a decrease in their rankings, relative to the unbracketed condition.
> >
> > H3c: If with another candidate with same VS characteristic, but lower quantitative variables, the candidate will experience an increase in their rankings, relative to the unbracketed condition.
> >
> > H3c: Because of the previous predictions, within the simultaneous condition, variety seeking candidates that are alone will be scored higher than the same candidates that happen to be bracketed with someone with a higher quantitative score but the same novel characteristic.

The final set of hypotheses is new to the field of research on variety seeking. Experts will be used to assess how important the variable of region is to a candidate's application, and thus if the bracketing is arbitrary. In addition, it is hypothesized that experts will not be able to avoid the emphasis on variety that arises from arbitrary bracketing. Can experts avoid the bias of placing a higher value on candidates who are different, yet have lower quantitative scores? The role of expertise is viewed as a possible moderator for the variety seeking bias. Because college admissions experts are trained to look for variety, it is predicted that they will also succumb to the systematic biases described in Hypotheses 1, 2, and 3. Thus, the following hypothesis arises from these predictions.

H4: These biases will be observed even with expert decision makers.

Using these hypotheses, two experiments were created. The first aimed at understanding Hypotheses 4 by using speak aloud protocol techniques, asking experts to make admissions decisions in both conditions. The second focused on Hypotheses 1, 2, and 3, with novices making admissions ratings in two conditions, bracketed and unbracketed.

This paper is different from pervious studies about the consequences of sequential and simultaneous decision bracketing in its dependent variable. Instead of measuring the amount of variety chosen, this paper measures the value placed upon that variety. Though variety is preferred in both conditions, it is predicted to be valued differently in the simultaneous condition.

Study 1

Study 1 was an exploratory research study conducted with expert decision makers. Four participants were confronted with the task of rating thirty (30) candidates for admission into the University of Pennsylvania and asked to qualify their decisions through protocol analyses. These participants were trained experts in admissions decisions. They were randomly assigned to one of two conditions. In the first, they evaluated the candidates in a random order, thus unbracketed. In the second, bracketed, condition they were told to evaluate candidates based on high school, yet without any other restrictions. The dependant measures taken were the ratings of candidates in the two lower levels of quantitative quality, but with variety seeking characteristics.

Participants

This experiment took approximately thirty minutes to complete, as participants were asked to speak aloud and discuss their decisions. Because of the small sample size, these protocol analyses were deemed as important in understanding the process behind the experts' decisions. There were two participants in each condition, and conditions were randomly assigned. The dependant measures were both the ratings given to candidates and the types of oral comments provided.

Method

Each participant was told that they were to simulate being an admissions officer for the University of Pennsylvania. Their task was described with the following introduction.

> You work for the University of Pennsylvania Admission's Office and are a Regional Director for the Midwest States, including Nebraska. After reviewing all of the potential candidates, you narrowed the list down to the following 30. You had minimum requirements for SAT score and GPA, and the each of these 30 candidates passed. For each of the following candidates, give them an overall rating of 1 for "definitely will not be admitted" and 10 for "definitely should be admitted."

Each participant was also told that there was no difference between the high schools from which the candidates originate. They were told to make judgments based on their previous knowledge of admissions and the community of students at the university. No questions were answered and no more information was given as to how to rate candidates.

Each participant received thirty (30) notecards serving as summary sheets for the candidates. Figure 1 is an example of one of these cards. Each candidate was given an SAT score, class rank, and unweighted GPA. In addition, ratings were given based on

the pool of candidates from Nebraska for academics, secondary school report, nonacademics, personal potential, personal statement, alumni interview and recommendations. Rankings and other quantitative scores were created based on the range of admitted candidates from the Class of 2007. Three general levels of candidates were formed, Level 1 (L1), Level 2 (L2), and Level 3 (L3), with Level 1 being the highest. The differences were not very great within levels, but were marked between levels. This was done not only to replicate the actual pool of candidates, but also to more easily approximate the normative rating for each candidate. Finally, each candidate was given a qualitative comment, ranging from uninteresting to variety seeking characteristics. The characteristics used are found in Figure 2.

Candidate #: 4
High School Name: Arapahoe High School
High School Location: Holdrege, NE

Academics		*Non Academics*		*Application*	
Overall Academic Rating	8	Overall Nonacademic Rating	9	Personal Statement	9
Secondary School Report	8	Personal Potential	8	Alumni Interview	8
				Recommendation	8

* The Ratings on the chart range from 1-10 with 10 being impressive.
They are ranked from the original pool of candidates from Nebraska.

SAT: 1450
Class Rank: top 5%
GPA unweighted: 3.7

Comments: Great participation in school activities.

Figure 1

L3- 5 Participated in the National Speech Team competition for Extemporaneous Speaking
L2- 5 (together-L3) National Speech Team participant in Impromptu Speaking
L3- 8 (alone-L3) National Speech Team for Dramatic Duet Acting

L3- 9 Basketball team co-captain
L2-19 (together-L3) Basketball player, team co-captain
L3- 3 (alone-L3) Team co-captain, Basketball player

L3- 1 Great tuba player, won several state-level competitions
L2- 1 (together-L3) Tuba player, placed first at state-level championships
L3-4 (alone-L3) Tuba champion on a state-level

Figure 2

Condition 1 was the bracketed, simultaneous choice situation, replicating the actual admissions process. Six total brackets were formed by combining all five candidates from a certain high school. Participants were asked to first group the notecards by high school, and then rate each candidate within his bracket. Special emphasis was placed to make the bracketing as subtle as possible, setting no other restrictions on the rating process. Participants were allowed to revise their decision after evaluating subsequent schools, and several did take advantage of this option. Because of the negative consequences of restricting freedom to change decisions, choice was not restricted in this manner (Frey et al 1984).

Each high school consisted of one L1 candidate, three L2 candidates, and one L3 candidate. Once again, this was done to ensure a proper distribution of candidates to high school bracket. Two types of high schools were created. The first type had one L3 with a variety characteristic (alone-L3) and four other candidates with no such characteristic. The second had one L3 (together-L3) and one L2 (L2) with the same variety characteristic, though worded slightly differently. Alone-L3 and together-L3 were exactly the same candidate quantitatively and had the same variety seeking characteristic. Figure 4 is an illustration of the conditions.

The unbracketed, sequential condition was used as a control and is represented in Figure 3 as Condition 2. In this condition, participants were asked to evaluate candidates sequentially, with no bracketing. The notecards were shuffled so as to eliminate any order effects. The same exact candidates were used in both conditions.

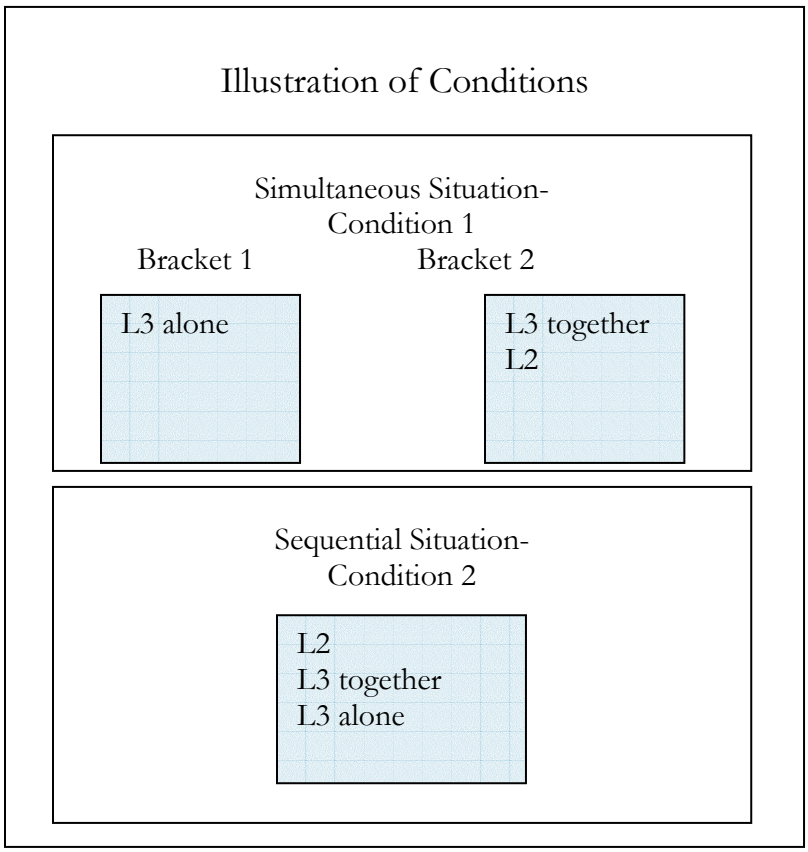

Figure 3

Results and Discussion

Preliminary analysis showed an interaction effect as a function of characteristic for the tuba player ratings. Tuba may be a characteristic that is explicitly valued, as all L3 tuba candidates were ranked higher than other L3 candidates. In addition, there was no main effect of condition on the tuba player rankings. This is an important insight because it illustrates the difference between explicit variety (musical ability) and implicit variety (high school). Because of this interaction between characteristic and condition, the tuba player ratings were dropped from the analysis, while the rest of the data was collapsed across this variety seeking characteristic. The data was then analyzed for order

effects, and because of the small sample, several instances were found and subsequently removed from the analysis.

A significant difference in candidate ratings was obtained from for the L2 candidates. Instead of receiving an 8, as they did in the sequential condition, L2 candidates were rated as 9s or 10s in the simultaneous condition ($F=27$, $p<.01$). When order effects were removed, all of the L2-candidates were ranked as best from their school, despite their lower quantitative scores. In the sequential condition, no L2 candidates received perfect scores.

Part of the hypothesized result was also obtained for the L3 candidates. Every L3 candidate was ranked equally in the sequential condition. There was one instance in the simultaneous condition where the alone-L3 candidate was ranked higher by one point. Further analyzing the data for rankings, as opposed to ratings, yields that all alone-L3 candidates were ranked as fourth, while the together-L3 candidates were ranked fifth from their particular school. Thus, bracketing effects increased the value of variety for alone-L3 candidates but did not change the value for together-L3 candidates. This is different than the hypothesized result of together-L3 candidates loosing ratings in the simultaneous choice condition. This provides insight into the process by ruling out contrast effects as a reason behind the results. Had contrast effects played a role in the ratings, together-L3 candidates should have suffered due to the bracketing.

Data from the protocol analysis yielded similar results. Table 1 summarizes the relevant reasons admissions experts cited for the ratings that they gave. Variety seeking candidates in the simultaneous condition were compared to others in their bracket, while the same candidates in the sequential condition were also compared to other candidates

with the same characteristics across schools. Thus, the simultaneous bracketing introduces too much emphasis on seeking variety within a particular school, and not enough on maximizing the total utility of each candidate. It is therefore apparent that bracketing based on high school or region is arbitrary, as it increases the value of region as a variable. Two very different mechanisms yield the results in each condition. In the simultaneous choice situation, candidates are not values intrinsically, but instead compared to their heterogeneous bracket. In the sequential choice condition, candidates are valued through a combination of intrinsic characteristics and comparison to others who are similar to them.

Condition	Comments on L2	Comments on L3-together	Comments on L3-alone	Summary
Simultaneous	"fun little impromptu speaking is very cool" go before person with higher grades "something that stands out" "comments are most important" get ranked first "that's different, we haven't see this yet"	Compare two B-ball players, give one higher and one lower score cannot take both tuba players from same school "poor little tuba player just got the shaft" academic quality lowest- other speech team	Lowest academic quality and already have a speech team person Tuba player weakest in school, go last "go with basketball player even though lower scores" "that's different"	Compare candidates that have variety in each school Focus on the "other" tuba player but not the case when alone in a school Too much emphasis is based on school
Sequential	Compare to other L2 1 variety "sucker for music" compare to other athlete, team helps 1 variety, but lower scores better GPA than athlete, so higher score athlete looks similar as before speech team	Compare to B-ball player, lower scores Tuba again- order effects Too "whatever" Because of sport, same scores as other Tuba player- looks whatever Speech team-compared to pool	1 variety compared to other L3 1 variety but not added component of teamwork compare to other tuba player, but lower scores athlete but GPA lower, takes time average scores, but speech team musician but not as good as other one	Focus on comparing candidates with same VS across schools No emphasis on HS diversity Compared across all pool Variety still important, but not treated differently depending on artificial bracketing Individual differences

Table 3

Study 2

Undergraduates were confronted with the same task as Study 1; they were asked to rate thirty (30) candidates for admission into the University of Pennsylvania. They were randomly assigned to one of two conditions. In the first, they evaluated the

candidates in a random order, thus unbracketed. In the second, bracketed, condition they were told to evaluate candidates based on high school, yet without any other restrictions. The dependant measures taken were the ratings of candidates in the lower levels of quantitative quality, but with variety seeking characteristics.

Participants

Twenty-eight undergraduate students at the University of Pennsylvania were approached in the course of two weeks to participate the study. The experiment was the same as in Study 1, but took approximately twenty minutes to complete. Participants were rewarded with chocolate candy bars upon completion. They were randomly assigned to condition, with fourteen (14) in the unbracketed condition and thirteen (13) in the bracketed condition.

Preliminary Analysis

The central hypotheses of this study related to the differences between the simultaneous and sequential choice conditions in the rating of candidates. Each participant was asked to evaluate candidates with three different variety seeking characteristics. Similar to Study 1, the data showed an interaction effect as a function of characteristic for the tuba player ratings. Tuba once again seemed to be a characteristic that is explicitly valued, as all L3 tuba candidates were ranked higher than other L3 candidates. Because of this interaction between characteristic and condition, the tuba player ratings were dropped from the analysis, while the rest of the data was collapsed across this variety seeking characteristic. The data was then analyzed for order effects, and none were found.

Results

The independent variable in this analysis was whether the decision situation was simultaneous or sequential. The dependent variable was the rating of candidates that had a variety seeking characteristic. As predicted in Hypothesis 1, there was a systematic difference in the ratings of candidates in the two conditions. Table 1 summarizes these results.

Mean Rating of Candidates

Raw Data

	Tuba Player			Speech Team			Basketball Player		
	L2-1	**L3-1**	**L3-4**	**L2-5**	**L3-5**	**L3-8**	**L2-19**	**L3-9**	**L3-3**
Simultaneous	8.46	7.15	7	8.08	6.31	6.85	8	6.23	6.54
Sequential	8	6.21	6.39	7.07	5.96	6.10	7.35	5.5	5.5

Table 1

As a manipulation check, the higher quality candidates' ratings were compared to the lower quality candidate ratings. L2 candidates were rated as significantly better than together-L3 candidates in both conditions ($F_{seq}(1,54)= 13.8$, $p<.01$; $F_{sim}(1,52)= 39.06$, $p<.01$). The same was true between L2 candidates and alone-L3 candidates in both conditions ($F_{seq}(1,54)= 11.58$, $p<.01$; $F_{sim}(1,52)= 18.85$, $p<.01$).

Hypothesis 2 stated that the sequential condition will yield candidate ratings as most reasonable. In order to test this hypothesis, together-L3 together candidates were compared to alone-L3 candidates. There was no significant difference between the two ratings, meaning that the same candidates were evaluated similarly ($F=.03$, $p=.88$). This leads to the conclusion that variety was rated equally across candidates in this condition.

Hypothesis 3 concerns the difference between the rankings in the sequential and simultaneous conditions. Table 2 summarizes the ANOVA results between the two conditions. L2 candidates were rated as more qualified to be admitted in the

simultaneous condition. It is apparent that variety is weighted more when it is bracketed with other candidates that also have variety characteristic, but lower qualitative scores (Hypothesis 3c). In addition to the increase in ratings for well-qualified candidates, variety in the simultaneous condition also helped lower-qualified candidates that were bracketed alone (Hypothesis 3a). Thus, being the only variety seeking option candidate in a particular bracket increases the rating, but only in the simultaneous condition. Unlike Hypothesis 3b, together-L3 candidates did not have a significant decrease in their rating. Thus, contrast effects as a driver of the results can eliminated as bracketing did not affect them.

Candidate	Sequential Mean	Simultaneous Mean	ANOVA result
L2	7.20	8.03	$F = 7.01$ $p < .05$
L3 together	5.73	6.26	$F = 2.04$ $p = .16$
L3 alone	5.80	6.72	$F = 4.66$ $p < .05$

Table 2

Hypothesis 3d regarded the difference in ratings of alone-L3 and together-L3 in the simultaneous condition. When analyzing the raw data, it seemed that no significant difference emerged between these two types of candidates ($F=1.44$, $p=.23$). Because this was an important manipulation that was hypothesized, the data was further analyzed by standardizing within respondents. Thus, as opposed to comparing the raw results, the standardized results were compared. With this analysis, there was a significant difference between the together-L3 and alone-L3 blocked candidates, with alone-L3 dominating ($F=12.53$, $p<.01$).

Discussion

The results of Study 1 show the effects that simultaneous choice situations have on the ratings of candidates. More generally, these systematic effects of condition have an impact on the value of variety. In the simultaneous condition, the variety of high

school is given more value than in the sequential condition. Because of this added value, lower quality candidates that are bracketed alone are rated as higher than those that are in the sequential situation. In addition, higher quality candidates with a variety seeking characteristic are rated higher in the simultaneous choice condition. Interestingly, the together-L3 candidates do not profit from this added value of variety, because in that bracket, the L2 has already taken advantage of it. This led to the result that alone-L3 was rated as higher than together-L3.

It thus seems that each bracket is allotted a number of "variety points," or added value given to candidates with variety seeking characteristics. In the case of two candidates that have the same special characteristic, these points are allotted to the more preferred candidate. Thus, not only do simultaneous choice situations increase the amount of variety chosen, but also the preference for variety options. The sequential choice situation, while still giving preference to variety, did not have these added value points. While in the sequential condition variety was still sought after and given value, it was less important than in the simultaneous condition.

General Discussion

"Poor little tuba player just got the shaft." "That's different, we haven't seen that yet." "I will go with the basketball player even though he has lower scores than the other candidates." "I cannot take both tuba players from the same school." Comments such as these, which arose in the protocol analysis conducted with admissions experts, illustrate the nature of the systematic biases in the college admissions process.

This paper focused on the variety seeking bias in this type of high-involvement decision. It was hypothesized that because of the variety seeking bias candidates would

be ranked differently in each of the two types of situations, simultaneous and sequential. Simultaneous situations involve evaluation of candidates based on bracketing by high school. Sequential situations involve evaluation of candidates independent of any bracketing. Because the variety seeking bias is magnified in simultaneous decisions, it was hypothesized that candidates with variety characteristics would profit from the bracketing.

Two major conclusions can be drawn from this research: the importance of bracketing and the systematic difference in the weighting of variety within the bracket. Studies 1 and 2 modeled the college admissions process and found systematic differences in the rating of candidates based on decision situation. Through experts' protocol analysis, it was determined that the value of variety of region was not explicitly desired, thus bracketing by region introduced a bias. This bias led to different ratings for the variety seeking candidates, who were defined as those that have a unique qualitative characteristic. Decision makers attempted to diversify the choice set across the brackets, thus accepting at least one candidate from each bracket. This led to more qualified candidates with variety seeking characteristics greatly profiting from the bracketing, often being selected as the top choice within a high school. Lower qualified candidates also benefited from the bracketing, but only if they were the only variety seeking candidate of that high school. Therefore, the same candidates received different scores simply due to the arbitrary bracketing.

This paper adds to the body of research on variety seeking in that it addresses a new dependant measure of variety. Namely, it attempts to quantify the relative value of variety as a function of the decision situation. Simultaneous decisions not only lead to a

greater amount of variety being chosen, but also to more value being placed on the variety candidates. As described in Study 2, it appears that each bracket is allotted a finite and equal amount of variety bonus points to be allocated to candidates. How these points are allocated reflects not only on the amount of variety chosen but also on the preference for the variety choices. Not only do simultaneous decision situations lead to choice sets that have more variety, but specific variety alternatives are more preferred.

But, what is the underlying process driving the difference in the value of variety? Why does the simultaneous decision situation elicit such an emphasis on variety? The contrast effect explanation can be ruled out for two reasons. First, it leads to the prediction that together-L3 should be hurt by the bracketing, but the data showed that there was no difference in the rating of these candidates. Second, contrast effects cannot explain the increase in the ratings of alone-L3 candidates because they were not compared to any other particular candidate.

One possible explanation for this bias is that in these situations, decision makers seek global, as opposed to local, maximization. Thus, in an effort to create the perfect set of candidates, individual utility is sacrificed. This paper showed that global utility was not maximized by bracketing as candidates were evaluated relative to others in their high school and not to the other candidates who are similar to them. Because high school is an arbitrary choice of bracketing, and diversification based on this attribute is not necessarily desired, it seems irrational to place such an emphasis on it. While global utility was not directly measured, as rating of candidates was open to interpretation, it appears that evaluation in the sequential condition was most rational and led to the best

overall choice set. More future research is needed to probe into the issue of global and local maximization and the optimal choice set.

The results of the two studies showed that the weight placed on the different characteristics of applicants is fluid and changes based on the choice situation. Because of bracketing, more weight is placed upon high school or region, and this leads to lower quality candidates being rated as higher. Thus, quality is sacrifices for the sake of variety (Ratner, Kahn and Kahneman 1999). The weight of variety changes systematically based on which bracket a candidate belongs to, and higher weight is received when the candidate is alone. Previously, research has shown that the final choice set from a bracketed choice situation is one with a higher than desired level of variety. This research attempted to understand how each option chosen because of this emphasis son variety is valued. In the value function of each choice, what is the weight of variety and how does this change based on bracketing? These systematic fluctuations were not observed in the sequential choice situation. Future research could employ conjoint analysis to quantify the weighting of variety based on condition and more accurately understand the value function driving choice.

Future research can also seek to understand the memory biases that arise based on simultaneous bracketing. Ratner, Kahn, and Kahneman (1999) showed a discrepancy between real time experience and memory of experience, linking this difference to the excess variety chosen. Do these same effects apply to high-involvment, expert conditions? Melioration effects should also be addressed in future research, with a focus on quantitatively modeling this choice process. Finally, the influence of affect could be an interesting part of this decision situation.

In order to better understand the process behind these results, future research needs to address the limitations of these studies. Larger sample sizes and more controlled environments may make these results more generalizable. Future inquiries can focus on varying the involvement of the decision makers. They can also vary the degree of expertise of the evaluators, focusing on whether or not they have an ideal point available (Chernev 2003). What affect would the existence of an ideal point, or an ideal candidate, have upon the evaluation of candidates?

The current research has many implications for understanding the college admissions process. It questions the validity of the current bracketing employed at most institutions. Because of the systematic biases that arise from this arbitrary bracketing, it may be advisable for college admissions procedures to eliminate them. But, because of the cognitive load that would be placed upon admissions officers if no bracketing was used, there may be a more effective method of administration that would decrease the effects of the variety seeking bias. It is possible that candidates are divided based on variety seeking characteristic, as this was the default method of comparison in the sequential choice condition. But, this too would yield a bias towards comparing within characteristics and a focus on increasing variety across the characteristics. A process similar to bracketing based on high school would emerge. Thus, the answer to how to achieve the benefits of simultaneous and sequential choice situation while minimizing the biases that co-occur remains to be found.

These results, and the new dependant measure of variety employed in this research, can be applied to decisions apart from college admissions. Other high-involvment, expert decisions also suffer from the same variety seeking bias due to

bracketing effects. Future research should address the type of situations that yield themselves to this process of decision making. In conclusion, this research begins to question some assumptions of the variety seeking literature. Why is some variety more highly valued than others? Should not all basketball players be evaluated on an equal playing field? Why is all variety not created equal?

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