



## Full Length Research Paper

# Increasing undergraduate students' higher order learning and course achievement through the takeaway technique

James Carifio, Lisa Erikson and Shanna Thompson

University of Massachusetts-Lowell

### Abstract

Take-aways are the key and critical messages and meanings learners derive from presentations and interactions of all kinds. Cognitive learning theory Takeaways are not prescriptive; rather they are extracted and constructed by the learner at the conclusion of a learning session. Little research has been done on this backend of the learning process. This inquiry explored the Takeaway technique in a variety of ways by having 30 undergraduate students write a brief Takeaway after each class in an introductory cognitive psychology course and relating their Takeaways to the quality of their responses to in-class higher-order essay exam questions. Students were also asked to evaluate the positive and negative aspects of Takeaways and provide remedies for the negative aspects they identified. The quality of student Takeaways predicted essay exam achievement at  $r = +.45$  across 3 such exams with students being positive about the technique by the end of the course. Students' Math, Verbal, and Writing SAT scores did not predict the quality of the Takeaways they wrote (as predicted), or their scores (grades) on the 3 essay examinations in the course. Student evaluations of the Takeaway technique were congruent with both the model and theory of Takeways developed as the framework for this study, which is presented in this article. Overall, the Takeaway technique is a relative simple and flexible device and strategy that may be used in many different ways to develop students cognitive and meta-cognitive skills and learning character, and higher order cognitive processes and understandings of subject-matter content, even though the technique has limitations and drawbacks which may be overcome in various ways. As predicted, the cognitive Takeaway was particularly successful with and helpful to students who were novices in the subject-matter to be learned.

**Keywords:** higher order learning, achievement enhancement, anxiety optimization, meta-cognition, long-term memory formation, science and social science learning.

## INTRODUCTION

### Overview

If one has training in business, advertising, marketing, political science, funding raising or campaigning, one is most likely vaguely familiar with the concept of the "take-away" in any content presentation or interaction, and its key importance as an evaluative and effectiveness criterion for summarizing the critical essence of the interchange, whether it is a live presentation or a web-page or series of web-pages or a lecture or a chapter in a book. If you are in education, you might not be familiar with the concept of the "take-away" or its key and critical importance in the teaching-learning exchange, and the

critical "back-end" of the learning process; namely, what happens and what students do *after* a presentation or interchange or learning session is done. From the point of view of contemporary cognitive learning theory, the "back-end" of the learning/instructional process would be "post learning processes and activities that organize, elaborate, consolidate, connect, and incorporate what the student *should be taking away* from the exchange into the student's long term memory via assimilation and/or accommodation processes. The critical difference here, however, is that contemporary cognitive learning theory

contends that all of these “back-end” processes **should not be prescriptive** (namely, done by the instructor or the instructional agent), *but rather that they should be actively done by the student*, and that such “back-end” processing should be **a meta-cognitive habit** that is developed in the student to the point that it is an automatic and highly active part of the student’s everyday information processing activities. In this regard, then, the instructional or cognitive “Takeaway” is very different from other forms of the “take-away,” and the cognitive learning theory form of the technique is very different than other forms and views of the technique.

Very little research has been directly done to date on the cognitive Takeaway or Takeaway technique, and very little theory about the technique has been formalized. This article will first formalize some of the theory needed to understand and test the cognitive Takeaway and Takeaway technique (which is the invention of the senior author of this article) in series of formal and more experimentally oriented studies, and then it will present the results of first and seminal “destructive” exploratory testing of the technique that established a few of the baselines needed for more formal and definitive studies of the cognitive Takeaway and Takeaway technique.

## Takeaways

Takeaway (food), in British slang, is a consumable (nourishment, hopefully) prepared by others that you actively ingest, digest and benefit from (unless they are empty calories) usually some time after the preparation processes and in a different place than the events that produced the Takeaway occurred (otherwise it is “swag from a job,” which is an equally important metaphor and concept). We can deconstruct this Takeaway metaphor in several important and different ways to develop the concept (which we will do later), but the most important point relative to this implied procedural and visual metaphor is that **“Cognitive Takeaway” is (or should) be produced by the learner/information processor (i.e., student) and not the teacher (i.e., environment) or teacher surrogate (e.g., textbook, teaching assistant, friend, parent, classmate, post-instructional handout or email) or any other anxiety-reducing agent that promotes learned helplessness syndrome, which is one of the hallmarks of overly prescriptive (and usually non-cognitive) learning and instructional theory.** In a word, “cognitive takeaway” is when you feed yourself and cook your own nourishment (meanings, understanding, knowledge) and clean up after yourself too (i.e., correct your errors, misconceptions, misunderstandings and other messes from the feedback you receive or testing of your understandings that you do).

So implicit in the concept of the Takeaway is the first fundamental principle of cognitive learning theory which is, *“Learning is a Do-It-Yourself-Project.”* Implicit in this

first principle (or slogan), then, is making the learner responsible (in part) for her or his own learning and the cognitive and meta-cognitive skills, processes, and activities that create the learning from the “hum and buzz” of the instruction experience and events. The *active learner* is at least a lip-service part of all theories of learning and instruction, but the **responsible learner** is only a key feature and hallmark of (most) cognitive theories of learning, all theories of androgogy, and most theories of character education and psycho-social development.

The cognitive Takeaway is based on the concept and theory of the learner being *continuously active and a continuously active processor* during instructional experiences and not an *intermittently or occasionally active learner and information processor*, as is characteristic of the majority of learners in highly prescriptive and over supported instructional processes (see Ashcraft, 2002 for details). Highly prescriptive instruction is a type of instruction which tends, as a loose generalization, not to resemble real world adult learning and learning contexts and situations (see Dagostino and Carifio, 1997 for details). This key point, therefore, brings one to the second general principle of cognitive learning theory.

The second general principle of cognitive learning theory is, *“You are supposed to learn in spite of the environment you are experiencing.”* Again, one hears the responsibility theme in the second principle, but with the added caveat of becoming even more responsible, as well as savvy about compensating for and overcoming relatively noisy, turbulent, chaotic, and not-neat-with-a-bow-on-it (and-exactly-what-I-need-to-know-for-the-test) experiences and streaming (multimedia) messages of all kinds; namely, the *very essence of what the entire cognitive apparatus is suppose to be for and do* (see Hauser, 2009 for details). Again, in a word, if one does not give the student **at least part** of the responsibility of de-noising, organizing, elaborating and understanding “instructional” experiences and messages, and the opportunity and responsibility of doing so and practicing this set of skills and strategies, then how does one expect the student to develop these skills and strategies before being out there in the adult world of work and life and in sink or swim situations?

This notion of *cognitive engagement* is really much more important than typically realized and it is actually a prerequisite of successful social engagement, which is the current soup-de-jour in higher education now. Just as overly clean childhood environments produce asthmatic adults, overly prescriptive instructional environments tend to produce overly dependent, intellectually passive and helpless adults who tend not to be inventive, problem solvers, or self-directed producers. Consequently, learning to construct good cognitive Takeaways, a primary cognitive and meta-cognitive skill set, promotes the transfer of various learning responsibilities and their

development to the learner, and thus makes the learner accountable in some kind of measured part (or context determined percentage) for her or his own learning and development. The cognitive Takeaway, therefore, promotes the development, practice and habituation of cognitive engagement and a fuller set of self-directed (or loosely guided) cognitive engagement skills and strategies, and particularly so as compared to more prescriptive instructional theories and instructional practices. The Takeaway, then, could be said to be directed at developing **learning character** (Carifio, 2005), which is a generic and emerging concept in several different contemporary schools of instructional and learning theories.

It should be clearly noted that the cognitive Takeaway in and of itself is not going to produce the transformations cited above overnight in some kind of wholesale or magic fashion. The technique is just one small (but highly flexible) strategy for promoting the kind of learning responsibility, engagement and character development briefly described and elucidated above.

### Theoretical Framework

According to cognitive learning theory (i.e., Bruning et al, 2012; Ashcraft, 2001; and Schunk, 2011), the back-end of the learning process would be processes, activities and assignments that organize, elaborate, consolidate, connect, and incorporate what the student *should be taking away* from an (instructional) exchange or event into the student's long term memory. However, cognitive theory also contends that all of these back-end learning processes **should not be prescriptive** (namely, done by the instructor or the instructional agent), but rather that they should **be actively done by the student** and should be **a well established meta-cognitive student habit**; namely, a continuously *cognitively active and self-regulated* learner (see Zimmerman, 1994; Green and Azvendo, 2007; and Dinsmore et al., 2008 for details). This view of learning and instruction has been characterized as *learning as a do-it-your-self project* (with occasional guidance and high quality feedback) and *learning in spite of things, difficulties, obstacles and the environment*, or more succinctly, *learning character* (see Eagle, 1997; Reivich and Shatte 2002; and Carifio, 2005 for details). Various aspects, components, and dimensions of this theoretical view, moreover, are present in the works of Spielberger (1972), Ausubel (1976), Meier and Seligman (1976), Vygotsky (1978), Mandler, (1989), Erikson (1993), Dagostino and Carifio, (1994), Kintch (1998), Neisser and Hyman, (1999), Pressley (2002), Meeter and Murre, (2004), van Dijk (2006), and Pinker (2009), and each will be commented on in more detail below where necessary. The Take-Away Technique is one (highly versatile) way of operationalizing this view and theory as part of any formal

or informal learning event or informational exchange.

### The Take-Away Technique

The *Take-Away Technique* is the component of an instructional system that develops a student's Take-Away skills and habits. The cognitive theory view of the take-way technique, therefore, focuses on *the student* actively extracting and creating the meanings and messages of the exchange rather than "zoning out" and passively waiting to be told what the meaning and messages of the presentation or exchange were or are (see Carifio, 2010 for details). The *student* must figure out and create the "gist" of the meanings and messages in the exchange and then must formulate them into a form that can be communicated to others. It is the *student* who must actively organize and sort out the meanings and the messages and elaborate them and organize them into wholes and schemas that may be expressed to others and thus into a form that is more amenable to being incorporated into long term memory. Recent research, moreover, has shown that elevated *but optimized* anxiety levels in students during learning greatly facilitate and maximize long term memory formation for the materials being learned (see Meeter & Murre, 2004 for details). Elevated but optimized anxiety levels during learning and particularly in the back end of the learning process, consequently, is a good and not a bad thing, as it enhances the formation and strengthening of the learner's long term memory structures. The cognitive learning theory form of the take-way, therefore, *intentionally* acts to inhibit student passivity and learned helplessness (see Meier & Seligman, 1976 for details), as it *transfer the responsibility* and task of extracting and organizing the meanings and messages of a presentation or exchange to the student, and makes the student actively do these key cognitive tasks and processes and actively practice them with each exchange. The Take-Away technique, therefore, focuses on building learning character and responsibility (see Reivich & Shatte, 2002 for details), and cognitive learning theory predicts that student learning, and particularly higher order learning, should increase over time through being actively responsible for and engaging in these key *back-end* processes (see Kintch, 1998; and van Dijk, 2006 for details).

### Purpose

The purpose of this research was to do formative evaluation and 'destructive testing' of the cognitive learning theory version of the "Takeaway" technique to see what effects it obtained and what problems were encountered, as well as what the limits of the technique were or might be in typical instructional situations. The

main reason the “Takeaway” was chosen for closer scrutiny and investigation is that it is a fairly simple technique that can be easily implemented in a variety of adaptations if it is effective, and it is a technique that is focused on the “back-end” of the learning process where there has not been a great deal of detailed research relative to higher order cognition and complex learning and retention.

## METHODOLOGY

The cognitive Takeaway technique was tested in an undergraduate cognitive psychology class at a US university in the northeast with 33 students who were sophomores, juniors, and seniors. About two-thirds of the students were psychology majors and about a third was male. The students were given the assignment of producing a one-page (the minimum) written summary of what they considered to be the key points, exchanges, and messages of the 90 minute class that occurred twice a week, within 24 hours of the class (the critical period for long-term memory formation and consolidation), and submit their “Takeaway” for the class to the instructor’s teaching assistant. The Takeaways for the classes counted for 20% of their grade. This 20% was determined by the percentage of Takeaways the student did that met the minimum acceptance criteria for the Takeaways for each Round (see below for details). There were 30 classes in the course and the instructor sometimes lectured and sometimes engaged the students with Socratic questioning and various class activities directed at illustrating the tenants of cognitive psychology and cognitive learning theory. If a student missed the class the student was required to produce a Takeaway for the reading assignments that were supposed to be completed prior to the class. The course has 3 written exams on the readings assigned both before class and after class and the essay exams were spaced 5 weeks apart.

The questions on the 3 essay exams were questions that required the students to explain and elaborate course content, concepts, principles and theories and to relate aspects of course content together in their written responses. The exams also had one question that was an application question that required higher order critical thinking. Table 1 presents a sample of the types of short essay questions used on these exams. On the third exam the first short essay question asked student to list the what they considered to be the 3 to 5 benefits (positive points) they found in doing the Takeaways, as well as what were the 3 to 5 negative points they found in doing the Takeaways and how they thought the negative points might be eliminated or minimized (see Table 1 for the exact question). The first exam was in-class and students were required to remain in class the entire period at which time they were told that what they had

written was a draft of their answers and that they were to “take them away” and redo them and submit the original and redone exam within 7 days. They were also asked to do a Takeaway of this first exam experience after they finished redoing their short essay answers. The second exam was a take home (out of class) exam. The second exam, therefore, was a different type of “Takeaway” experience, but one that students had to summarize (nevertheless) and produce a Takeaway on relative to comparing and contrasting the second exam as an experience to the experience of the first exam. The last exam was an in-class old-fashioned **high stakes** essay exam, which was somewhat of a novel experience for many of the students in the course. Students also had an option of writing a paper in the course to improve their grade so that all risk-taking and forms of active responding and engagement were reward including those that did not work out as well as expected or the student hoped.

All essay exams and papers were scored and graded by the senior author using the university’s letter grade categories and point system and selectively rescored by him to get an intra-rating agreement estimate which ranged from .91 to .94 for samples of 10 from each exam. Only one student chose to do a paper because there was a topic in the course that greatly interested her and she wanted to learn about it in more depth. Her paper on this topic was excellent. No student flunked the course or obtained a grade lower than a C, although there was one incomplete and two withdrawals, bringing the sample size down to 30 students.

On the take-ways for the first third of the course, students were allowed to write “bullet points” rather than sentences and paragraphs to keep the bar low and help them develop the skill and habit. Low level feedback was given by the teaching assistant directed at doing little more than getting each student on the same page relative to doing the task. The requirements and rubric for the Takeaways were changed for the middle third of the course (Round 2) to a list of 5 evaluative criteria (see Table 2). Complete sentences were required and occasional brief helpful comments on the correctness of what was written were given as needed. A full and formal 5 point (criteria and defined levels for each criteria) scoring rubric was developed for the Takeaways in the last third of the course (Round 3) and sentences and paragraphs were required and some occasional formal critical feedback was given on the Takeaways written (see Appendix A for details). The key was to keep the extra instruction and, extra instructor work factors to a minimum. We used this changing and escalating acceptance criteria design to see what the “limits” that students could tolerate or handle were, as well as to estimate their rates of growth in developing the “Takeaway” skill. All aspects of the Takeaway technique implemented in this exploratory study were directed at building the Takeaway habit and skills, and practicing and

**Table 1.** Sample essay questions on the three examinations given including the exact question asking students to evaluate the strength and weaknesses of the Takeaway technique.

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*First Exam*

Briefly define the cognitive view of knowledge, propositional representation and what a schema is including specific examples.

Compare and contrast logical and metaphoric operativity and their roles and functions in cognitive psychology and give examples of each.

*Second Exam*

Define and summarize the key features and functions of the working memory component of the standard general model of information processing and cognition.

Define and discuss fear of success and how it can influence information processing, thinking and decision making.

*Third Exam*

List in rank order (or indicate the rank after afterwards) the 3 to 5 positive outcomes you personally obtained from doing the "Takeaways" this semester and then the 3 to 5 negative aspects or problems you found relative to doing the "Takeaways" this semester, and suggest, if you can, how you would fix the problem you list.

Summarize Kohlberg's model of Moral Development and Ethical Reasoning and relate it to Piaget's work and Carol Gilligan's work.

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**Table 2.** Acceptance Rubric for the Second Round of Takeaways in this Study

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*Length- Minimum of One Page*

If roughly less than one page is submitted, the student will be asked to finish the page as required and no points will be deducted if a complete one-page submission is made within 7 days.

*Format-* The minimum one page Take-Away should be written in **Complete (and preferably Coherent) Sentences** (*paragraphs preferred but a list of complete sentences is acceptable*), with diagrams **labeled and the labels defined** in a minimum of one sentence. Ego-centric speech should be avoided.

No bullets phrases or scattered, random pictures without explanations accepted in this round.

*One error is allowed on the first page without needing to be corrected and 4 errors are allowed on each subsequent page without needing to be corrected.*

*Timeliness- Entries are submitted on time.*

Lateness will be penalized **more than errors** with a "tick" lost for each day late *after the two day grace period.*

*Content-* Students tend to use one of two styles: (a) summarizing one or two class topics and relating the topic or topics to their personal experiences, or (b) summarizing and comparing and contrasting different topics covered on that day and relating it to previous material covered. **Either style is acceptable, and you are encouraged to try you hand at both.**

*Citations-* If what you write are not your own words or words or points that did not occur in class or the materials distributed or assigned, you should indicate this fact as well as from where the material came, at least in a general way (e.g., "paraphrased from ...."). *It is more than acceptable to "do some additional homework/reading" on any term or idea that occurs in class to elaborate it in more detail, but it is best to indicate when and where you've done this in a reasonable way to avoid confusions.*

*Rewrites:* All writing is re-writing. **You may rewrite any take-way and the rewritten take-away will be substituted for the original one.**

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automating them, as the key component of the treatment was to prepare students for the culminating event and criteria (or dependent variable), which was their performance on the essay questions on the final exam, one of which asked them to do an evaluation of the Takeaway technique itself (i.e., “The Last Takeaway”... for awhile).

Completing the Take-Away for the class counted for 20% of each student’s grade, which gave students adequate incentive to do the Take-Aways required of them. However, students were *purposefully* given minimum feedback on the Take-Aways in order to get an estimate of the effects of the Take-Aways *with minimal feedback and little additional work by the instructor*, and to keep the amount of additional instruction received by each student from the Take-Aways at a minimum and roughly a constant for each student. Any effects that were observed, therefore, would be **the minimum baseline effects of using the Take-Away Technique** without any additional work required or done by the instructor, thus keeping the instructor’s work load and work time constant, which is an important practical factor and estimate to have for the Take-Away Technique and getting instructors to use it. The instructor in this study did not read any of the Take-Aways students produced until after the course was over in order not to bias results, and the logging of the Take-Aways submitted by these students and the scoring of them with the simple rubric used in this study was done by a teaching assistant.

One of us (Thompson), rated the Takeaways students wrote as they were produced on a simple 1 to 4 scale where 4 was outstanding, 3 was good, 2 was acceptable and 1 was unacceptable according to the criteria for the Takeaway “round.” The professor teaching the course and scoring the essay exams (Carifio) did not see or read the Takeaways students produced after the first few, or specific problematic ones referred to him by Thompson, in order not to bias his presentations and teaching or developed positive and negative halos for students in the class. Another of us (Erikson) rated random samples of the Takeaways (20 per round) after the course was concluded and the 60 rating Erikson did agreed with Thompson’s 88% of the time. The average rating of the 10 Takeaways students did for each round of Takeaways were used to do analyses.

Erikson did the initial content analyses (and coding) of the positive and negative points (with remedies) that students provided at the end of the course about the Takeaway technique after she and Carifio read all student responses and agreed upon a set of categories and sub-categories that were congruent with the theoretical framework for the study and captured what students said. The actual responses (positive points, negative points and remedies) of each student are given in Appendix B so that they may be directly read and analyzed by anyone, and so the reader may gain a more

nuanced understanding of the evaluation of the Takeaway technique done by these undergraduate students. Erikson’s classifications and codings were reviewed when done by Carifio, with a discussion of each disagreement until the disagreement was reconciled. Disagreements occurred in less than 10% of the points rated, coded and classified. Although the essay exam scoring system and the Takeaway scoring system were truncated (primarily to reduce scale development and scoring burden in this exploratory study), both had sufficient variation and reliability for the analyses required to tentatively answer the basic exploratory questions of this study.

Additional data were obtained on these students which consisted of university GPA, Verbal SAT, Math SAT, and SAT writing sample scores to test several hypotheses regarding these variables being the source of the findings observed rather than the Takeaway technique itself. SAT data were not available on all students nor did all students take the Writing SAT. Cognitive learning theory predicts that these background variables should only have low correlations with the Takeaways students produced that decrease over the course of the “treatment,” and with the quality of these Takeaways for several reasons including the known level of relationships between cognitive abilities and meta-cognitive skills (see Corno, 1986; Pangares, 1996; Paris and Paris, 2001, and Green and Azvedo, 2007 for details) with the Takeaway being a (teachable) cognitive and meta-cognitive skill and skill set.

Complete data were available on 30 of the 33 students in this study. In terms of these 30 students, there were 3 Freshman, 13 Sophomores, 9 Juniors and 5 Seniors. Sixteen (22) of these students were female and 8 were male students. Twenty (20) were psychology majors, and the other 10 students were from Engineering, Criminal Justice, Computer Science, Allied Health and Liberal Arts. Eight (8) of the 30 students were minorities (Black, Hispanic and Asian). The mean math SAT score for this group was 517 with an SD of 92. The mean verbal SAT score for this group was 519 with an SD of 82, and the mean writing sample SAT score for this group was 516 with an SD of 85. The mean university GPA of this group was 3.01 with an SD of 0.52. Overall, these students were fairly typical or slightly above average for university students with reasonable and adequate variability for examining the initial exploratory questions of this study.

We can only report selected aspects of the entire dataset collected in this study, as it is a veritable “treasure trove” of data and findings that will take more than one paper to report. As stated at the beginning of this article, the results of the “destructive testing” presented here will focus on establishing a few of the baselines and basic facts needed for more formal and definitive studies of the cognitive Takeaway and Takeaway technique.

**Table 3.** Correlations between Math, Verbal and Writing SAT scores and Average Takeaway Ratings by Rounds.

		Math SAT	Verb SAT	Writing	TA-1	TA-2	TA-3
Math SAT	Pearson Correlation	1	.850(**)	.884(**)	-.027	-.093	-.360
	Sig. (2-tailed)		.000	.000	.906	.672	.092
	N	25	25	16	22	23	23
Verb SAT	Pearson Correlation	.850(**)	1	.915(**)	-.070	-.084	-.345
	Sig. (2-tailed)	.000		.000	.756	.704	.107
	N	25	25	16	22	23	23
Writing	Pearson Correlation	.884(**)	.915(**)	1	.159	.316	-.151
	Sig. (2-tailed)	.000	.000		.604	.271	.607
	N	16	16	16	13	14	14
TA-1	Pearson Correlation	-.027	-.070	.159	1	.529(**)	.237
	Sig. (2-tailed)	.906	.756	.604		.003	.216
	N	22	22	13	29	29	29
TA-2	Pearson Correlation	-.093	-.084	.316	.529(**)	1	.647(**)
	Sig. (2-tailed)	.672	.704	.271	.003		.000
	N	23	23	14	29	30	30
TA-3	Pearson Correlation	-.360	-.345	-.151	.237	.647(**)	1
	Sig. (2-tailed)	.092	.107	.607	.216	.000	
	N	23	23	14	29	30	30

\*\* Correlation is significant at the 0.01 level (2-tailed).

## RESULTS

Our results were fairly dramatic. First, as predicted, Verbal SAT, Math SAT, and SAT writing sample scores did not predict Takeaway completions rates or quality. All correlations were close to zero except for the Writing SAT, which as .36 and significant at the .09 level. Performance on the 3 rounds of Takeaways, however, correlated moderately and significantly with each other with the  $r$ 's ranging from .54 to .67 (see Table 3 for details).

Next, as predicted, Verbal SAT, Math SAT, and SAT writing sample scores did not predict the essay examination scores. All correlations were essentially zero. Performance on the 3 essay examinations, however, correlated moderately and significantly with each other, with the  $r$ 's ranging from .47 to .59 (see Table 4 for details). It should be noted here that SAT scores are seen primarily as indicators of the type and quality of prior preparation and knowledge students have rather than as ability measures as certain kinds and types of prior preparation could influence students' familiarity with and preparation for doing Takeaways and essay examinations. All students in this study reported that they were unfamiliar with the Takeaway technique prior to being exposed to it in the course.

Next, the number of Takeaways completed and their quality predicted essay question exam scores/grades for all 3 exams ranging from  $r=.41$  to  $r=.49$  (see Table 5 for details). Also, the quality of the Takeaways for each round significantly predicted the quality of essay examination scores for the round, which is an important

outcome, as the "bar" for the Takeaways for each round and the difficulty of the essay examination questions for each round were raised for each round over the 15 weeks of the course, it will be recalled. These correlations are possibly inflated due to the sample size, but are impressive none the less and supportive of the view that shifting the responsibility of actively producing the Takeaways for each instructional exchange to students has significant effects of the several kinds hypothesized.

Table 6 presents the correlations between the university GPA's for these student and their Math, Verbal, and Writing SAT scores. As can be seen there are strong correlations between students' university GPA scores and SAT scores ranging from .63 to .80. Table 7 presents the correlations between the university GPA's for these student and the quality of their Takeaway and Examination scores by the 3 rounds in this study. As can be seen from Table 7, there were only moderate correlations between students' university GPA's and their Takeaway and essay examination scores ranging from .35 to .49. Students' Takeaway and higher order essay examination scores were far less predictable from their university GPA scores that were their Math, Verbal and Writing SAT scores! But this outcome would be predicted from Takeaway theory.

Recall that Math, Verbal and Writing SAT scores **did not** correlate significantly with Takeaway or essay examination scores and **could not predict** either of these two scores in this study. However, students' university GPA's *highly predicted* their 3 SAT scores, but only very moderately predicted their Take-away or examination

**Table 4.** Correlations between Math, Verbal and Writing SAT scores and Essay Examination Scores by Rounds.

		Math SAT	Verb SAT	Writing	Test-1	Test-2	Test-3
Math SAT	Pearson Correlation	1	.850(**)	.884(**)	-.073	.017	-.146
	Sig. (2-tailed)		.000	.000	.740	.939	.505
	N	25	25	16	23	23	23
Verb SAT	Pearson Correlation	.850(**)	1	.915(**)	.025	-.161	-.019
	Sig. (2-tailed)	.000		.000	.908	.462	.930
	N	25	25	16	23	23	23
Writing	Pearson Correlation	.884(**)	.915(**)	1	-.058	.035	-.049
	Sig. (2-tailed)	.000	.000		.843	.906	.869
	N	16	16	16	14	14	14
Test-1	Pearson Correlation	-.073	.025	-.058	1	.472(**)	.487(**)
	Sig. (2-tailed)	.740	.908	.843		.008	.006
	N	23	23	14	30	30	30
Test-2	Pearson Correlation	.017	-.161	.035	.472(**)	1	.597(**)
	Sig. (2-tailed)	.939	.462	.906	.008		.000
	N	23	23	14	30	30	30
Test-3	Pearson Correlation	-.146	-.019	-.049	.487(**)	.597(**)	1
	Sig. (2-tailed)	.505	.930	.869	.006	.000	
	N	23	23	14	30	30	30

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Table 5.** Correlations between Takeaway Rating by Rounds and Essay Examination Scores by Rounds.

		TA-1	TA-2	TA-3	Test-1	Test-2	Test-3
TA-1	Pearson Correlation	1	.529(**)	.237	.413(*)	.302	.451(*)
	Sig. (2-tailed)		.003	.216	.111	.112	.014
	N	29	29	29	29	29	29
TA-2	Pearson Correlation	.529(**)	1	.647(**)	.434(*)	.458(*)	.419(*)
	Sig. (2-tailed)	.003		.000	.016	.011	.021
	N	29	30	30	30	30	30
TA-3	Pearson Correlation	.237	.647(**)	1	.378(*)	.486(**)	.428(*)
	Sig. (2-tailed)	.216	.000		.039	.006	.018
	N	29	30	30	30	30	30
Test-1	Pearson Correlation	.302	.434(*)	.378(*)	1	.472(**)	.487(**)
	Sig. (2-tailed)	.111	.016	.039		.008	.006
	N	29	30	30	43	30	30
Test-2	Pearson Correlation	.302	.458(*)	.486(**)	.472(**)	1	.597(**)
	Sig. (2-tailed)	.112	.011	.006	.008		.000
	N	29	30	30	30	30	30
Test-3	Pearson Correlation	.451(*)	.419(*)	.428(*)	.487(**)	.597(**)	1
	Sig. (2-tailed)	.014	.021	.018	.006	.000	
	N	29	30	30	30	30	30

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

questions scores, which means that there is a factor that is being partially captured in students' GPA's that is not captured in and is unrelated to what their 3 SAT scores measure. That "X-factor" in students GPA's that is common to one of the factors that is required to be

successful on the Takeaways and essay examinations over the course of the 15 week semester, is what the senior author of this paper has called **learning character**, which is quite different from learning ability or aptitude. This "X-factor," which may be seen in Tables 4



**Table 6.** Correlations between Students' undergraduate GPA's and Their Math, Verbal, and Writing SAT scores.

		uml GPA	Math SAT	Verb SAT	Writing
GPA	Pearson Correlation	1	.638(**)	.701(**)	.798(**)
	Sig. (2-tailed)		.001	.000	.000
	N	32	25	25	16
Math SAT	Pearson Correlation	.638(**)	1	.850(**)	.884(**)
	Sig. (2-tailed)	.001		.000	.000
	N	25	25	25	16
Verb SAT	Pearson Correlation	.701(**)	.850(**)	1	.915(**)
	Sig. (2-tailed)	.000	.000		.000
	N	25	25	25	16
Writing	Pearson Correlation	.798(**)	.884(**)	.915(**)	1
	Sig. (2-tailed)	.000	.000	.000	
	N	16	16	16	16

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Table 7.** Correlations between Students' their Math, Verbal, and Writing SAT scores and their Takeaway and Examination Scores by Round.

		uml GPA	TA-1	Test-1	TA-2	Test-2	TA-3	Test-3
uml GPA	Pearson Correlation	1	.418(*)	.452(*)	.590(**)	.433(*)	.356	.478(**)
	Sig. (2-tailed)		.024	.012	.001	.017	.053	.007
	N	32	29	30	30	30	30	30
TA-1	Pearson Correlation	.418(*)	1	.413(*)	.529(**)	.302	.237	.451(*)
	Sig. (2-tailed)	.024		.111	.003	.112	.216	.014
	N	29	29	29	29	29	29	29
Test-1	Pearson Correlation	.452(*)	.302	1	.434(*)	.472(**)	.378(*)	.487(**)
	Sig. (2-tailed)	.012	.111		.016	.008	.039	.006
	N	30	29	43	30	30	30	30
TA-2	Pearson Correlation	.590(**)	.529(**)	.434(*)	1	.458(*)	.647(**)	.419(*)
	Sig. (2-tailed)	.001	.003	.016		.011	.000	.021
	N	30	29	30	30	30	30	30
Test-2	Pearson Correlation	.433(*)	.302	.472(**)	.458(*)	1	.486(**)	.597(**)
	Sig. (2-tailed)	.017	.112	.008	.011		.006	.000
	N	30	29	30	30	30	30	30
TA-3	Pearson Correlation	.356	.237	.378(*)	.647(**)	.486(**)	1	.428(*)
	Sig. (2-tailed)	.053	.216	.039	.000	.006		.018
	N	30	29	30	30	30	30	30
Test-3	Pearson Correlation	.478(**)	.451(*)	.487(**)	.419(*)	.597(**)	.428(*)	1
	Sig. (2-tailed)	.007	.014	.006	.021	.000	.018	
	N	30	29	30	30	30	30	30

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

to 7 is the cognitive and meta-cognitive skills and self-management capabilities that so many different researchers and theorists have written about over the last twenty years, the macro form of which Carifio has called *learning character* to express that it is a qualitative and enduring change and characteristic of the learner. This point is clearly seen in Table 8, which presents the

unrotated results of a standard principal component factor analysis of Takeaway scores, essay examination scores, Math, Verbal, and Writing SAT scores and undergraduate GPA.

As can be seen from Table 8, the Takeaways, Examination scores and undergraduate GPA form the first independent factor that accounts for 40.7% of the

**Table 8.** Unrotated Factor Structure Takeaways, Essay Examinations, SAT scores, and Undergraduate GPA

Variable	Component	
	1	2
TA-1	.664	.176
TA-2	.830	.011
TA-3	.684	-.509
Test-1	.712	-.184
Test-2	.789	-.387
Test-3	.729	-.287
Math SAT	.283	.886
Verb SAT	.138	.891
Writing	.212	.868
GPA	.840	.371
Explained Variance	41.7%	30.3%

variance and the SAT score form the second independent factor which accounts for 30.3% of the variance. Although the sample size in this exploratory study does not come close to meeting the traditional sample size requirements for doing a factor analysis, the tentative results observed support the points made about learning character in this study. Of further importance is the fact that the Takeaways **do not** correlate with Verbal or Writing SAT score (nor do these two variables “load” on the Takeaway scores in Table 8), which empirically show that Takeaways **are not** “just writing” and just a “writing activity” and are different from journal keeping, journaling and other similar forms of writing. This particular finding strongly supports the theory of Takeaways presented at the beginning of this paper. Lastly, learning character in its various forms was not directly measured in this exploratory study but will need to be measured in subsequent studies to confirm or deny the points made here as well as other points and findings in this study.

Table 9.1 presents the frequencies of the student-generated **positive aspects and outcomes** of doing the Takeaways over the course of the semester by general the macro and micro categories devised to reflect the general theory of Takeaways that guided this study, and Table 9.2 presents the frequencies of the student-generated **negative aspects and outcomes** of doing the Takeaways over the course of the semester by general the macro and micro categories devised to reflect the general theory of Takeaways that guided this study. Students were also asked to provide suggested solutions to remediate or diminish the negative aspect and outcomes of doing the Takeaways over the course of the semester, and all of the positive and negative points they made and suggested remedies that form the primary data for Tables 9.1 and 9.2 are given in appendix B. It will be

recalled that students were asked to do this positive-negative-remedies evaluations of the Takeaway technique as the first question on their last essay examination and they were asked to rank order their positive and negative points and these rankings are reflected in the way the data is displayed in Tables 9.1 and 9.2. The last column in these two tables labeled “Ratings” gives Carifio and Erikson’s reconciled rating on a 1 to 5 scale of how consonant the positive or negative given is with Takeaway theory. A sample of the exact positive points students made about the Takeaways in given in Table 9.1A (Quotable quotes about the Takeaways by students).

As can be seen from Table 9.1, students independently cited all of the positive aspects and benefits of the Takeaway technique that are part of the technique’s core theory. In particular they cited how they had to prepare for class, attend class, and actively focus, engage and pay close attention to what was happening in class and make sure they understood the content that was being interactively taught during the 90 minute period and extract, organize and express the key and critical points and concepts and their relations and then summarize them and convert them to acceptable prose. Forty-nine (49) of the 107 positive points made (46%) cited comprehension skills and the improvement of cognitive and meta-cognitive comprehension skills, and 31 of the 107 (29%) positive points made cited post-learning processes and retention improvement benefits as a hallmark of the Takeaway technique, making 75% of the independent benefits cited by students’ dead-center theoretically. Improved writing and study skills comprised the other 25% of the positive points cited by students for Takeaways. As can be clearly seen from Table 9.1, Takeaways affect the *front-end, middle, and back-end of the learning process* as their theory predicted.

**Table 9.1.** Student-Generated Positive Aspects and Outcomes of Takeaways Rated by Consonance with Takeaway Theory

Student Ranking of Point	1	2	3	4	Total	Rating
<b>1. STUDY SKILLS</b>					<b>18</b>	
11. Required students to read (text/articles)	1	0	0	0	1	5
12. Prepare prior to Lecture	0	1	0	0	1	5
13. Focus during Lecture	2	0	0	0	2	5
14. Note-taking skills improved	0	1	0	0	1	4
15. Required Learning Time Management/metacognition	0	1	1	0	2	4
16. Increased academic Confidence	1	1	0	0	2	4
17. Overcoming academic obstacles	0	0	1	0	1	5
18. Attendance increased	0	0	2	0	2	4
19. Learning to learn from emails, peers, other	0	1	2	0	3	4
20. Application of new skills to other classes	0	0	0	1	1	4
21. Easy Grade	0	0	1	0	1	1
<b>2. COMPREHENSION SKILLS</b>					<b>49</b>	
22. Organizing Info to makes sense of info	8	6	3	0	17	5
23. Making connections reading/Life /lecture/concepts	2	4	5	3	15	5
24. Revising and learning from Feedback from TA	0	3	2	3	8	4
25. Interesting, Creates desire to learn more	0	2	1	0	2	5
26. Increased depth and ways of thinking, elaborating	1	1	2	3	7	5
<b>3. RETENTION ( TEST TAKING SKILLS)</b>					<b>31</b>	
27. Organizing notes for clear, concise Study Review	1	6	3	0	10	4
28. Rewriting, Repetition	11	0	3	2	16	5
29. Discovering best study format for self	1	0	0	1	3	3
30. Less Exam stress	0	0	0	2	2	4
<b>4. WRITING SKILLS</b>					<b>11</b>	
31. Practice	0	2	2	1	5	5
32. Speed	1	0	0	0	1	4
33. Redoing notes into structured form	1	1	1	1	4	4
34. Feedback from TA improved writing skills	0	0	1	0	1	3
	30	30	30	17	107	

As can be seen from Table 9.2, students independently cited many negative aspects of being required to do Takeaways some of which are indeed inherent in the technique but several of which were due to our being somewhat vague initially in order to see what and what types of Takeaways students would produce and the “destructive testing” approach of the technique purposely used. Changing the acceptance criteria and raising the bar 3 times in 15 weeks and not clearly fixing the task and technique initially was too much and trying to go too far too fast for about half of the students in this group in this introductory cognitive psychology course which was essentially new and unfamiliar content to these students even though 20 of the 30 were psychology majors. It should also be noted that many of the “negatives” cited were not negatives at all but reflected exactly what the student should have learned

from the Takeaway technique experience; for example, not to procrastinate and wait too long to create the Takeaway for a class and to learn to do and write them quickly. Students also had many good suggestions for eliminating the negatives and improving the Takeaway technique which will be addressed in the conclusions to this article.

Tables 9.1 and 9.2 are the heart of this study and what the central design and purpose of this initial exploratory study of the Takeaway technique was about at its core; namely, did undergraduate students actually perceive that technique to help them derive the benefits and skills that the theory asserted and did acquiring these skills and benefits improve understanding, higher-order learning, and performance. This group of students “got” the Takeaway technique and inferred much of its theory independently and collectively on their own and could

**Table 9.1A.** Quotable quotes about Takeaways from Students

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1. Nobody likes to do homework, especially me! The TA's were a great tool, and besides the fact that I don't like to do homework, I think they were, overall, a positive aspect of this class!
2. First positive outcome, I paid attention more in class.
3. Pushed me to come to class; because attendance isn't mandatory, but I didn't want to get points off for not doing the takeaways.
4. The first and most positive aspect of the TA's was the way they forced us to do the reading, including the articles and materials sent directly from Prof Carifio, it was still outside reading.
5. They helped me get a better understanding of what each class was about.
6. I'm now better at focusing on key points during a lecture.
7. Being forced to bring order to the chaos that sometimes unfolds in class made me pre-organize what I was trying to learn.
8. The next positive outcome would be that as I was writing about the class I would think more in depth about whatever topic was for the day.
9. In general, the TAs made me actually think about the material instead of just memorizing it temporarily for a test.
10. The most important positive thing that came out of the "Take Aways" was my ability to organize the information I had gained that day into a short and concise page to look back on.
11. Summarizing. I thought it was very helpful summarizing our notes into essay format because it helped me with exams and I retained the information better.
12. I gained understanding by representing ideas as structured sentences rather than fragmented notes.
13. They helped me study for the exams more because they were more clear and concise and in order. I could just read each takeaway and understand and recall what we learned in class.
15. I have become better at understanding and creating text from notes taken in class. This makes me understand the material more and helps me retain information.
16. Secondly, it helped me become a better writer.
17. Learned how to write papers quicker, though practice.

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**Table 9.2.** Student-Generated Negative Aspects and Outcomes of Takeaways Rated by Consonance with Takeaway Theory.

	Student Rankings				Total	RATING
	1	2	3	4		
<b>1. INCONVENIENCE</b>						
41. Not collected right away led to "cramming"	3	0	1		4	1
44. Time : takes too much	2	1	2		5	2
47. Printing costs	0	0	1		1	2
49. Hard to obtain notes/ write TA if Absent	1	4	1		6	2
<b>2. COGNITIVE LOAD</b>					45	
42. If not done right away, HARD to understand even with notes	2	4	2		8	3
43. Number of submissions due	3	0	2		5	3
45. Amount of Writing too much/tedious	5	0	1		6	3
46. Writing makes incorrect info stick	0	1	0		1	4
48. Creating text from notes difficult	1	4	0		5	4
51. Rubric and Grading Changing/difficult/confusing	4	3	1	1	8	4
52. Taking notes too difficult/inefficient	0	1			1	3
53. Hard make connections to other material/Life	3	1	3		7	3
54. Hard to learn what's important from EMAIL	2	1	0	2	4	3
<b>3. MECHANICS</b>					28	
50. Expectations not made clear	2	2	2		6	4
55. Feedback not timely	1	0	2		3	4
56. Feedback and grading on Writing format, not CONTENT- forcing re-do	1	3	5		9	4
57. Less effective Study tool for me due to mandatory format	0	4	5	1	10	4
	30	29	28	4	91	

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**Table 10.** One-Way Repeated Measure ANOVA of Three Essay Exams with Trend Analysis (N=30).

<b>Exam</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>		
Essay Exam 1	30	3.45	1.45		
Essay Exam 2	30	2.57	2.59		
Essay Exam 3	30	4.13	1.50		

---

<b>Within Subjects</b>	<b>DF</b>	<b>Mean Sq.</b>	<b>F</b>	<b>p</b>	<b>Omega-Squared</b>
Essay Exams	2	18.5	9.4	<.001	.24
Error	58	1.9			

Multivariate F= 7.08 (df=2, 28), p <.003; omega-squared =.34  
Mauchly's Test of Sphericity (homogeneity of variance): Chi-Square= 6.5, df =2, p<.04

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<b>Trend Analysis</b>	<b>DF</b>	<b>Mean Sq.</b>	<b>F</b>	<b>p</b>	<b>Omega-Squared</b>
Linear Trend	1	7.0	6.3	<.02	.18
Non-linear Trend	1	30.0	10.6	<.003	.27
Error					
Linear	29	1.1			
Non-Linear	29	2.8			

relate it to the cognitive learning theory they were learning in the course. This left the question of, "Did doing Takeaways improve their performance?"

About two thirds of the students had difficulties with producing the minimum Takeaways during the first third of the course, and about one-third of the students were regularly writing more than one-page Takeaways by the last third of the course. About one-third of the students had troubles advancing past "bullet-form" Takeaways and complained continually about having to progress past the "texting" form of the Takeaway, even though the whole purpose of the Takeaway was to help them move past their cell phone and "texting" everything to fuller, richer, thicker, and more nuanced and elaborated communications particularly inside their own minds as they processed information. Student complaints about not being able to do "texting" Takeaways were purposely and simply ignored and deemed unacceptable. Allowing students more "transition time" from the "texting" form of the Takeaway might have advantages in many contexts, but when students come to Takeaways late the transition typically has to be somewhat abrupt. It should also be note that conflict and dissatisfaction are not negative events or states in cognitive learning theory and are seen as the catalysts of change when they are optimized.

About one-quarter of the students started doing Takeaways in their other classes and exchanging their Takeaways with each other, particularly as their own and other students' Takeaways for a "round" were great study

guides for the essay test for that round, as more than one student pointed out in their comments. Almost all students were fairly poor **high-stakes** writers at the beginning of the semester (see below) and reported that it was very difficult for them to produce a single page of text. Almost all students reported that their abilities to do Takeaways improved over the semester and that they became more active listeners in class and paid attention more keenly and that their writing skills had improved, a fact that was corroborated by the difference in their performance between the first and last in class essay exams.

As a generalization, the quality of the Takeaways greatly improved over the 15 weeks of the course despite the continual complaining of a number of students about changing and raising the bar on the standards for a successful Takeaway, as informally assessed by a weekly "scoring review" by one of us (Thompson) and an informal post-course "reading review" of two of us (Carifio and Erikson). The analysis of this change and improvement requires another separate article, but the student who might be said to be the severest critic of the Takeaway technique emailed Carifio from graduate school the next fall thanking him for the Takeaway experience as well as the content of the course. The content of this email was:

I just wanted to take a moment to say "Thank you" for the wealth of info you provided during our course. As I am preparing my first Grad Assignment (4 essays on

different aspects of the history of psych - uggh), I realize how valuable it all is and the course experience was to me now.

Four (4) of the 9 sophomores in the sample also emailed Carifio the next fall to express their appreciation for the course and the development of their Takeaway skills. It should be noted that more formal longitudinal follow-up is needed of the Takeaway technique, as a delayed appreciation of acquiring Takeaway skills has been Carifio's experience with doctoral students he has taught the technique to over the years.

The improvement of the writing and the quality of the answers to essay exam questions in "blue-books" under formal high stakes testing conditions between the first and the last essay exam were also pronounced and remarkable, and it was where the improvement in **high stakes** performance was really and more objectively seen. The answers written to the first in-class exam questions were typically fairly illegible (perhaps unconsciously disguising a lack of knowledge and understanding), 3 to 5 sentence or rather sentence fragments, bullet points, lists, unexplained figures and diagrams, often unconnected information and expressive of lower order or factual cognition. Twelve (12) of the 33 students were done answering the questions on this first exam in less than 30 of the 90 minutes available, and 5 of these 12 students became observably angry that they were required to stay in the room to the end of the exam. Six (6) of the 12 went back to work on their first exam question between 20 to 30 minutes of ceasing to work on them. Most students were done responding in 60 minutes and all were done responding in 75 minutes. When Carifio then announced that their blue book answers were the first draft of their answers to the exam questions, and they were to take their bluebook home and rewrite their answers and return both versions to him in 7 days, there was a wide range of responses to his announcement including 3 students hugging him (literally) and two thanking him for being merciful (a characteristic not confirmed by doctoral students). A few students, however, were not at all pleased and wanted to submit what they had written in their blue book (in less than 45 minutes) for their grade, but reconsidered the wisdom of this strategy when they observed and thought about the behaviors of their classmates. All students submitted their redone first exam.

The performance on the last exam was the opposite of the first exam and it was better in fact than second take-home exam, which was a take-home exam as a point of contrast to compare to the performance on the first and last "battle field conditions" exams. The difference was so pronounced as to be remarkable even for an informal exploratory investigation. Table 10 present presents the statistically results of the difference between the 3 exams along with a trends analysis, all of which were significant at the .001 level with about a half a grade differences between the 3 exams, even though the exams like the

takeaways became harder as the course progressed. The trend observed between the three exams was non-linear, as predicted, with performance being worst and most variable on the take-home essay exam, (as it does not optimize and maintain optimized stress) which was the second exam given, as compared to the in-class higher-stakes examinations.

All students worked conscientiously on the exam questions for 60 to 75 of the 90 minutes available on the last in-class examination. Roughly a third of the students wrote for the whole 90 minute period. About half of the students produced Takeaway bullet points which they then use to expand and elaborate into their formally written answers to questions. Four (4) students even **rewrote** a "draft" they produced for the higher order synthesis question that was worth the most points on the exam. Answers were mostly legible and in sentences and mostly logical and reasonably coherent given the testing conditions. About half of the students used more than one blue book. The evaluation of the Takeaway technique done by students as the first question on this last exam were excellent and well-written as may be seen from reading mostly or close to their verbatim responses that are given in Appendix B. What was even more remarkable was how these students handle the stress of the last high stakes exam. Most were fairly relaxed and the climate of the room was cordial and friendly, and particularly so compared to the first exam where the anxiety and dissatisfaction was palpable. Most students looked Carifio in the eye when they handed him their bluebooks, seemed satisfied with their performance, and their ability to "stand and deliver," and made polite comments and social conversation before leaving. Their *learning character* appeared changed as compared to the beginning of the course and most seemed more confident that they could perform and perform well and quickly academically under high stakes conditions, which is one of the goals that the Takeaway technique seeks to achieve. Most students expressed appreciation of Thompson and all of her work and effort on managing the Takeaway system and providing them with feedback on their Takeaways over the course of the semester when they needed the feedback, which is not the mostly exciting or pleasurable work assignment for anyone.

## CONCLUSIONS

As Einstein once said, "If we knew what we were doing, it wouldn't be called research." There are many ways in which we would redo and/or improve the study we did if we had the results and experience of the study we did to guide us, but we had to do the study we did to gain these insights. That is what exploratory research and "destructive testing" is all about, and we are a long way from having fully analyzed the study we did; namely, there are 900 actual Takeaways to be more closely

analyzed to assess the contours and shape of the macro changes observed and reported here.

However, it is clear from Tables 9.1 and 9.2 that these students in general understood what Takeaways were, and their essential nature and characteristics by the end of the course, and that these 30 students independently verified many aspects and features of the Takeaway theory outlined at the beginning of this article in terms of their own personal weekly experiences and personal changes across the 15 weeks of the course, and did so under high stakes testing conditions demonstrating that they had indeed acquired some level of the cognitive and meta-cognitive skills and learning character that the Takeaway technique was directed at developing. This independent experiential verification of aspects and features of Takeaway theory by students learning and experiencing the technique is important initial confirmation of the theory and the Takeaway technique and is normative and consensus validation that is not some form of confirmation bias. Novices “get” the technique (often after much complaining) by the end of the training period, but typically “really get it” after the training period when they encounter more “real life” and *higher stakes* tasks that they need to perform *quickly* to be successful. Thus the need for “longitudinal” studies of the technique and its effects beyond the time interval of the period that the technique is employed as some of the effects of the technique are often delayed and to see if the Takeaway habit is retained as some preliminary qualitative data suggests and how long it takes to habituate the Takeaway for different students at different educational levels and levels of development as well.

As shown in Table 8, the quality of performance on the takeaways were independent of Verbal and Writing SAT scores (and Math SAT scores as well) which demonstrated empirically that Takeaways are not “just writing” and just a “writing activity” and are different from journal keeping, journaling and other similar forms of writing. This particular finding strongly supports the theory of Takeaways presented at the beginning of this article and differentiates the Takeaway from other forms of writing and writing activities in the ways specified at the beginning of article paper. Additionally, as can be clearly seen from Table 9.1, Takeaways affect the *front-end, middle, and back-end of the learning process* as the theory predicted, and these features also distinguish it from journaling and other forms of writing and writing activities and clearly portray the Takeaway as a cognitive and meta-cognitive strategy and device for managing and enhancing the learning process.

As Ausubel said long ago, what is called “receptive learning” is anything but passive or a copying and stamping-in or prescriptive process and that view is one of the most common misunderstandings and misrepresentations of the “receptive learning” process or model, and the continuous and highly active hard processing work the student must do to cope and be

successful in a receptive learning situation and environment, and particularly so when it is interactive receptive learning. One aspect or dimension of the Takeaway technique is that it is a receptive learning “fail safe” mechanism that helps to prevent the learner coming to the learning event unprepared, or tuning out or “channel surfing” during the course of the learning event and more or less “blowing off” the core of what should have been learned and entered into long term memory on leaving and concluding the learning event, which may be referred to as “delaying learning” until some later time.

*Delaying learning* is a particularly pernicious form of procrastination that is actually encouraged and taught in highly prescriptive instructional processes currently where handouts of what is to be learned are passed out at the end of class or class notes, summaries or Powerpoint presentations or are emailed or posted immediately after class or the learning encounter. More than a third of the students in this study noted that they could not do or had great trouble doing their Takeaway if they left it too long after the finish of the class and that this experience altered their procrastinating behavior, as well as Thompson reminding them that they were supposed to write and turn-in their Takeaway within (roughly) 24 hours of the class. Carifio always waited 48 to 72 hours after the class to email class follow-up notes, summaries, Powerpoint presentations, additional commentary and new materials, which was done on purpose and is actually a variation on the concept and technique of *Teacher Wait-Time*. Carifio, therefore, would wait until students had produced their Takeaways before he would give them any prescriptive information about the class and what occurred and was taught in it, which in turn became *feedback* for students to compare to the Takeaway summaries they had already written to gauge how well they were understanding the class and selecting out and capturing its key points in their Takeaway. So the point here is to *prevent students from delaying their learning* and learning experiences and events by creating a “soft requirement” that is regular and hopefully becomes a ritual and habit which forces them to be prepared and continuously attentive, and *to delay* providing all of the prescriptive teacher-created summarizing materials that *prevent students from doing or eliminate the necessary of them doing* this hard work and daily cognitive exercise for themselves (i.e., the “good and bad cholesterol” concept). Note well: cognitive learning theory does not consider complaining students to be a problem necessarily and that complaining may even be a positive indicator when it comes to learning and instruction, which is going against the tide in the current grades 7 to 16 overly prescriptive zeitgeist and environment. Using the Takeaway technique, therefore, can entail some professional risk taking or at least so until the current tide begins to turn again.

The quality of student Takeaways in each round improved and significantly predicted the quality of higher-

order essay question answers in the round, and particularly so when the essay exam was given under high stake (in-class rather than out-of-class) conditions. Students' in-class essay questions answers improved significantly and markedly from the first in-class exam to the last in-class exam, as did the amount of time, effort and seriousness with which they took the exam and developed a "stand-and-deliver" approach to high stakes performance situations.

Students' essay examination responses became longer, more organized, more complex and more nuanced and sophisticated with each exam over the semester. The anxiety and dissatisfaction that was present and palpable in the room during the first in-class examination was not present in the last in-class examination and it was apparent to students and their professor that their high stakes performance anxiety had diminished and their learner character was undergoing change. The Takeaway technique significantly improved the quality of students' higher-order cognitive performance and productions over the 15 weeks of the course even given the noisy and exploratory and adaptive nature of their informal implementation and "destructive tryout" first run with undergraduates who were more or less novices in the area of cognitive psychology, which is considered to be somewhat of a quasi-science by some, and thus somewhat of a "high risk" course for many students. The Takeaway technique is in part designed to help novice students in high risk initial learning experiences (courses, apprenticeship, intern experiences, scholarly activities and jobs). In theory, the Takeaway technique should perform as it has in this study in science and mathematics courses and quasi-science courses such as economics, sociology, and political science, and it is in these contexts that further tryout and exploratory work with the Takeaway technique needs to be done. Several students in this study began to informally use the Takeaway technique in some of their other courses (including science and mathematics courses) and they reported that the technique was helpful and helped them to improve their learning and performance in these courses. It should also be noted that in long 3 hour classes, one can have students do Takeaways half way through or at the end of class (a different kind of "pop quiz") and that these "pop" Takeaways can be used as points of discussion, corrective teaching, or getting students "back-in-attention-and-focus-mode" for the second half of the class. The point here is that the Takeaway is a very flexible and adaptive concept and technique that can be used in many ways to prevent students from delaying their learning.

The Takeaway technique is labor intensive and requires some kind of Takeaway management system to implement and use as is clear from Table 9.2 and all of the comments by students in Appendix B and the "sworn" statements of Thompson who managed this process in

this study where roughly 900 Takeaways were produced by students. This aspect of the Takeaway technique is definitely a problem but one with many different remedies and remedies proposed by students who made 49 helpful and excellent corrective suggestions for eliminating the problems with Takeaways that are given in Appendix B. Obviously, developing an on-line procedure, system, tool and support software for managing the submission, logging, codification and provision of basic feedback on Takeaways would be a great help for using the technique and that tool will mostly likely one day exist. Until then, one can use email, wicki's and on-line learning software to do just this function and approximate this desired system. However, for novices and in many contexts, it should be clearly noted and remembered that "scratching out bullet-points on a napkin" as a proto-Takeaway is all that can be managed by some students initially (and that is what they will submit) and that one does not initially want to rule out this mode of responding when first teaching the technique. Further, the "Napkin-Takeaway" is a tried and true strategy and system that works and works well, as can be attested to by many adults in all walks of life and sometimes is the only low-tech system needed to get minimal Takeaway technique benefits.

It is critically important to remember that all of the effects that were observed in this study were *the minimum baseline effects* of using the Take-Away Technique without the teacher providing corrective feedback on them, or altering instruction as it progressed based upon the instructional effectiveness information the Take-Aways provide the teacher; namely, *without additional work or burden for the teacher or the instructor*. This latter parameter was a very important and critical parameter to estimate. This study showed the effects teachers and instructors can get from using the Take-Away technique doing essentially *little different* in their teaching, classrooms or courses or spending large amounts of additional work time on teaching the course or class in question. It is fairly obvious, however, that all of the effects of Take-Aways observed in this study may be significantly enhanced and even accelerated by providing corrective feedback to students on their Take-Aways and/or altering instruction based on the real time effectiveness evidence they provide, all of which are the kinds of further research needed on the Take-Away technique.

As previously stated, one can just collect up Takeaways after each session in a course and *delay* providing group feedback and summary materials until the Takeaways have been submitted by most students for coming by them to what they have written themselves. In this model, the instructor (or instructor designee) can sample the Takeaways submitted to assess how students are progressing and can selectively respond to some of the sample selected. Students in this study suggested doing takeaways for every other class or for groups of 3 or 4 classes, which again could be sampled to reduce



work load. Other students in this study suggested staying with the “bullet-point” Takeaway as it was easier and quicker to do and to evaluate and provide feedback on also. Using this strategy, of course, depends upon one’s objectives for using Takeaways, but, as previously stated, it is recommended not to change the acceptance criteria on Takeaways too quickly or too often with novice students in particular as many find it difficult to adapt that quickly. Higher acceptance standards and full prose Takeaways increase the assessment difficulty and burden, but it is these Takeaways that bring about better and quicker high stakes written productions. So there are resources needed and there are trade-offs necessary in using the Takeaway technique in different contexts and different situations, but the Takeaway technique can be implemented to some degree in most instructional situations and courses in a way that does not overburden the teacher or create too much work for the teacher or detract from other activities the teacher may want to use or objectives the teacher may want to accomplish.

That the Takeaway technique significantly and markedly improved the quality of higher-order essay question answers under high stakes (in-class rather than out-of-class) testing conditions would seem to indicate that the extra work that Takeaways may involve for teachers is more than worth it in the current climate of global competitiveness and demand for higher quality work and learning character of all of our graduates. Lastly, it must again be emphasized that Takeaways are about students’ behaviors and productions much more than teachers’ behaviors and instruction and about making students in part *responsible* for their own learning and achievements. A takeaway is about co-responsibility for learning successes and learning failures, and thus reflects a joint accountability and more adult learning model and learning environment. The Takeaway technique, therefore, is one small tool to help the transition from pedagogical instruction to andrological instruction to occur, hopefully earlier in schooling rather than later, and similar changes to occur to the learning character of students. Much further research on this high promising achievement and long term memory improvement technique is most definitely needed, but the start of this research process described in this study is more than just highly promising.

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## Appendix

### Appendix A: Take Away Rubric for Third Round of Entries

Criteria	4 Excellent	3 Good	2 Satisfactory	1 Unsatisfactory Students will be asked to rewrite	0 No Credit
<b>Length</b> _____	Journal entry exceeds one page in length	Journal entry is either one page in length or possibly longer	Journal entry just meets the minimum requirement of one page in length	Journal entry does not meet the minimum requirement of one page in length	Journal entry was never submitted.
<b>Timely</b> _____	Journal entry was complete and submitted before deadline.	Journal entry was complete and submitted by the deadline.	Journal entry was submitted during the 2 day grace period following the deadline.	Journal entry was submitted more than two days after the deadline.	Journal entry was never submitted.
<b>Writing Style</b> _____	Journal entry is written in complete sentences. The sentences form cogent, coherent reflections or essays. (Student uses conventions such as topic sentences, transitions, elaboration, synthesis, etc.)	Journal entry is written in a series of complete sentences, but the sentences are lacking logical transitions. No elaboration or synthesis is evident.	Journal entry is written as a list of complete sentences. No reflections on or connections with the topics are made.	Journal entry is written in incoherent and/or incomplete phrases, possibly separated by bullet points. No reflections on or connections with the topics are made.	Journal entry was never submitted.
<b>Writing Quality</b> _____	Journal entry shows a strong writing style with clear ability to express thoughts and point of view. Excellent grammar, syntax, spelling, etc.	Journal entry shows a good writing style with solid ability to convey meaning. Very good grammar, syntax, spelling, etc.	Journal entry shows a writing style that conveys meaning adequately. Some grammar, syntax, and spelling errors.	Journal entry shows a difficulty with expressing ideas, feelings, or descriptions. Limited syntax. Needs to work on grammar, spelling, etc.	Journal entry was never submitted.
<b>Reflection's Quality</b> _____	Journal response demonstrates an in-depth, insightful understanding of the content and concepts under consideration. The reflection's quality is exceptional. Student both summarizes and compares and contrasts topics with earlier material.	Journal response offers cogent commentary on a student's own growth in understanding. The reflection's quality is commendable but not exceptional. Student both summarizes and makes personal connections with topics.	Journal response does not demonstrate that the student understands the basic concepts associated with the course. The reflection's quality demonstrates a lack of understanding of or reflection on the subject at hand. Student only summarizes the topics from class. (Students will be asked to submit a paragraph or two that either makes personal connections or compares or contrasts topics with earlier material.	The quality of student's journal response is below expectations.	No journal entries have been submitted

**Total Score**

\_\_\_\_\_/5 = \_\_\_\_\_

**Appendix B: Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

**Table B1: First Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 1</b>	<b>NEGATIVE ASPECT 1</b>	<b>SOLUTION 1</b>
<b>02</b>	Bullet-point form aided retention and increased confidence that I "had a handle" on the material.	Once the 2nd round began, I no longer got timely feedback:	Perhaps one TakeAway per week is more easily managed by the teaching assistant?
<b>03</b>	I'm now better at focusing on key points during a lecture	Sometimes it was hard to relate it to previous material because it was a new topic. There possibly was a way to do it, but I just couldn't	The best way to fix it would be to have some students write their personal thoughts when dealing with a new topic.
<b>04</b>	helped when looking back at them during test/study time	I didn't like how the rubric kept changing.	I think we should have been able to write in whatever format suited us, and was easy for us to learn.
<b>05</b>	—Getting information engrained in my mind more efficiently	It may have been good to do some in class & share because someone's life examples may make the principles more clear for someone else to understand.	
<b>06</b>	Allowed me to piece together the lessons from class and to elaborate on class discussions	I had a hard time keeping up with my submissions. I always wrote a rough draft from my notes. I left the rough draft untouched for a few days and then went back to take a new approach to relating the content and to rewrite	To fix the problems I have listed, I would have to be more organized and timely on my responses. I should have wrote my reflection & sent it to Shanna right away for her response This would allow me to make corrections before they were due. Instead, I figured that if I let the information flow into my response that day, I could go back later + adjust it. Usually when I went back I would confuse myself + question whether I was right or not.
<b>07</b>	They helped me get a better understanding of what each class was about.	I sometimes did not like writing a takeaway for every class because it could be so time consuming sometimes, especially when I was behind on a few TA s and had to write a bunch all at one time. I can procrastinate sometimes so I would leave a lot of TAs until the last minute and it would take up a lot of time.	
<b>08</b>	—Reiterates information learned in class	If the TAs are not done after class it is hard to complete them	

**Table B1: First Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 1</b>	<b>NEGATIVE ASPECT 1</b>	<b>SOLUTION 1</b>
<b>09</b>	The first and most positive aspect of the TA journals was the way they forced us to reading, reading that although the articles sent directly from Prof Carifio, it was still outside reading. The articles kept everyone updated on new information instead of just general information in Cognitive Psychology	A few negatives I found for the journals first starts with the amount of them.	Instead of one being due every class, maybe one a week would work better Instead of relating every class maybe the two; classes can be compared them seems & then take those two classes and together relate them to one's own life
<b>10</b>	Help me gather my thoughts about the materials discussed in class.	There is a lot of writing involved, feels like I'm writing a short essay every other day	Although the routine of writing a journal entry every other day can be tedious, I can definitely apply this method to my other classes and better my understanding of the courses. It can improve my writing style and make for good essay practice. So even though it can be somewhat of a ritual, I must learn to get used to it if it will make my understanding of the class better and less confusing.
<b>11</b>	Doing the TA's was both rewarding and problematic. First, the biggest positive outcome was the organization of my notes This made it easier to study my notes later and see what did not understand as well so I could look up I the information in a book .	Some problems I encountered was when we first started doing them and I did not really know what was expected.	
<b>12</b>	"All writing is rewriting." I got to revisit the material to better understand it and it helped remember what we did in class	Towards the end of TA's we needed to write way too much and I was often searching for thoughts that were not as important as the main topic	I would recommend making it more than a page but not making them go back and fix it if that day we couldn't find more to write about.
<b>13</b>	I think there were lots of positive outcomes from the TakeAways. Dr. C always said in class, all writing is rewriting. I would write down notes in class and then rewrite them for the TA. I was always writing what I knew for the TA's (part of metacognition) and the positive outcome was that the more I wrote, the more I was able to remember things (the rote method).	One of the negative aspects was that I'm such a procrastinator. I often saved them all until the last minute and would have to cram in one night	This problem can be fixed by making myself more organized. Setting aside a certain amount of time each night to get my work done would help tremendously

**Table B1: First Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

Ss	POSITIVE OUTCOME 1	NEGATIVE ASPECT 1	SOLUTION 1
14	Great study guide to refresh my memory before an exam.	Was overwhelmed sometimes with the amount of material supplied through email.	If I would have stayed updated on my emails & and asked Shanna for help earlier than I did, I would not have stressed the situation as much as I did
15	Learned how to write papers quicker, though practice	Writing essays takes forever for me. I often spend upwards of 2 hours on one page	Fix? This is a personal problem, related to writer's block and/or fear of failure and self-sabotage. I need better metacognitive strategies.
16	Allows for better understanding of the material.	Tedious to write a page after every class	
17	Gained general gist of topics.	Time consuming	
18	stamps info into LTM	Sometimes hard to remember connections from class.	
19	The TAs helped me to review my notes and reinforce the material.	The criterion was at first general and open to interpretation. I generally had more than a page of information before the rubric requirement had to be met.	I would recommend a more open to interpretation approach. This could shed some light on many people's learning styles.
20	The TAs in this class was helpful in so many ways. We could review for the exams because the TAs summarized the main topics that we learned about.	There were many negative aspects to the TAs, like doing them on a regular basis and sometimes my writing (notes?) would be messy and I couldn't decipher what I wrote.	I solved the first problem by doing the journal entries right after class most of the time
21	The most important positive thing that came out of the "Take Aways" was my ability to organize the information I had gained that day into a short and concise page to look back on.	I think that the number one negative aspect of the "Take Aways" was how I never really knew what was expected because the grading scheme kept changing each time, which was very confusing.	Stick with one grading scheme.
22	I was able to recall information much easier by repetition and rewriting the information.	It took too much time to write out the TAs.	I think trying to find a way to fix these problems would be dependent on the individual.
23	<u>1st positive outcome</u> I paid attention more in class. Typically in classes, I take notes and then will read the book for the class instead. Because the books were optional and I didn't want to spend the money I had to pay particular attention the whole 75 minutes.	<u>Missing information.</u> If there was a certain idea that wasn't included in my notes, but were included in others, I didn't know where to find the info. It was in the emails, but I didn't want to spend hours combing through every one.	Make the emails have more of a guidance so that students can easily find the information they need.

**Table B1: First Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 1</b>	<b>NEGATIVE ASPECT 1</b>	<b>SOLUTION 1</b>
<b>24</b>	The TAs were very helpful to me over the semester. However, there were both good and bad things about this. The information was drilled into my head.	The rules constantly being changed and how they were graded.	I suggest a way to fix these problems is by removing the rubric.
<b>25</b>	I had a great deal of 'positive outcomes' in my take-aways. They provided opportunities to linguistically deepen my own mental concepts. The most pleasing would probably be the TA in which I discussed the nature of consciousness	There were TAs for which no strong personal concepts seemed relevant or were brought to light. In these TAs, I mostly discussed and reported the primary points from the days class and light evaluations. However, they did not spark a flow of internal conception to add to them. These would be my 'problem' TAs.	Perhaps time spent on investigation or depth of investigation might yield more involved and exciting additions of thought. Though certain topics were simply less intriguing and induced a less vibrant reaction
<b>26</b>	It helped reinforce what we learned in class.	If I wasn't motivated to write the TA the day of the class, I didn't write it.	
<b>27</b>	I personally believe that the takeaways are a great way to learn when you are writing them, because you are mentally retaining some of the information.	However, there are issues with the TAs. One of the major issues is if you are absent. Its hard to obtain notes from class discussion if you are absent.	
<b>28</b>	I am now able to relate many psychological concepts, schemas, articles, and facts to everyday life and personal experience. This makes the subject more interesting and easier to understand.	It was difficult to create text from the sporadic notes we took in class. Although I (attempted) learned to create at least a page of text from small notes, it was extremely frustrating and difficult.	The problems listed may only be relevant to me(if I was the only one struggling with them) but it would have helped if the notes/ lectures were more organized and contained information to cover the class period and not always running over the time limit.
<b>29</b>	The reflections to personal experiences were fairly easy, but when I was able to, it helped with understanding the concepts--as long as I received feedback	From the first time I turned in the TAs, I received a lot of comments about me doing unnecessary things, such as bullets. It really annoyed me because I guess I was over-analyzing the rubric or misunderstanding it or taking things too literally.	
<b>30</b>	A way for me to remember what we learned in class by rewriting.	I wouldn't always have time to do them after class so I would do all of them at once + not doing them seriously	
<b>31</b>	Re-evaluating, reviewing, and more processing of what we had learned in class that day	Hard sometimes to connect information to previous lessons or own experience.	

**Table B2: Second Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

Ss	POSITIVE OUTCOME 2	NEGATIVE ASPECT 2	SOLUTION 2
02	Being forced to bring order to the chaos that sometimes unfolds in class made me reorganize what I was trying to learn.	Once the 2nd round began, the feedback I got was on the writing, not the content	b. Make content feedback the goal, and only correct writing when it is glaringly necessary
03	Strengthened my ability to make connections to previous material	Sometimes it was hard to write one the same day if I was too busy	To fix that, I started doing outlines the same day and elaborating later.
04	"All writing is rewriting" ;it helped me to better understand what we did	I didn't like how we got graded on them w/ the rubric (for the 3rd round) because everyone learns differently and studies differently, so writing one	
05	—Being able to learn and relate it to my life One thing I learned and was immediately. able to relate to my life is the importance to master one language before trying to teach a child another one Being able to take these examples away and apply them in my life, makes it easier to learn the material. Instead of just relating things abstractly, I can see where it is applicable in my everyday life. This makes the material more interesting and more likely that I will remember it in the future	If you waited a little while after class to do them, sometimes you wouldn't remember all the principles and relate them well.	
06	Let me make personal connections to class material and add some information into my long term memory.	Sometimes I didn't understand the information so I felt like I was writing things that were not 100% correct. The problem is that writing makes the information stick. If I had a misconception realize later and it was hard to correct my error.	
07	They helped me study for the exams more because they were more clear and concise and in order. I could just read each takeaway and understand and recall what we learned in class	They were graded kind of difficult. I thought TA's were just for our sake and we could write what we needed to that helped us learn and understand. They needed to that helped us learn and understand. They were graded very strictly on grammar, length wise, if I wrote the right information and in my opinion I did not think that was necessary.	I would fix the problem by grading whether or not someone did the TA's instead of going into detail on what we did right and wrong on them. I believe that would be more helpful.



**Table B2: Second Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 2</b>	<b>NEGATIVE ASPECT 2</b>	<b>SOLUTION 2</b>
<b>08</b>	—Creates a desire to find out more about information in class.	—If a class is missed it is difficult to complete the Take Aways	
<b>09</b>	The second positive thing was that because one was due for every class it kept people writing which can help lessen the amount of egocentric writing.	The second, but less negative problem with the journals I found contradicts my second positive. While the journals force people to write less egocentrically, I thought the purpose of these journals were for our own help. Anyone can write a paper and that's what these journals seemed more like.	If a paper would be due every class then it should be called a Paper but if it's a journal being written for oneself then we would be able to write than the way that makes most sense for us Generally when people write in diaries or journals they're writing it for themselves so they write the way it makes sense to them .
<b>10</b>	When I use the TA's to study for my exams, the information is there and easily understood since it's written by me.	Whenever I missed a class and didn't write the TA for that day, it can be overwhelming when trying to write 3 or 4 of the TA's before its due date.	I must try to write a journal entry for that class day even if I was absent because, in the long run, it'll cut down on my work load tremendously.
<b>11</b>	Secondly, it helped me become a better writer.	The next problem was the increasing organization and structure expected as the rounds went up. At first, I would have trouble linking different concepts together and writing in paragraph form	
<b>12</b>	The TA's pushed me to communicate with other classmates about missed material. Otherwise, I normally don't talk or email as much as I did this semester.	I had a hard time writing them close to the day of class. When I looked in my notes to do them, sometimes it was hard to understand.	I would recommend giving 10 minutes or so to reflect on the class and allow some of us to at least start our TA's so that we won't feel so burdened to finish it at home.
<b>13</b>	The second positive outcome was the feedback I got from Shanna. I have to say she was great about grading TA's and getting them back to us on time w/lots of valuable feedback. She let me know where I needed to improve, but also where I excelled. I thought that was rare because most teachers usually focus only on the negative	Some of the things we discussed in class, I had a hard time relating to my own life, so that would be the 2nd negative aspect. I would often fill a page or 2 just with the summary and when it came time to relate it to my life, I felt that I couldn't relate to some of it, or it just didn't apply	

**Table B2: Second Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 2</b>	<b>NEGATIVE ASPECT 2</b>	<b>SOLUTION 2</b>
14.	Helped learn the material.	Sometimes not sure what to focus on for material.	Fix? I generally remember things better in an outline form, similar to the TAs in the beginning of the year.
15	Realized that setting an outline out before writing is very helpful.	Writing essays focuses me in on "how do I make the sentence grammatically correct" and not on remembering information	
16	Increased writing potential.	Sometimes difficult to take efficient notes, so expansion of ideas is tough	
17	Confidence I knew material due to familiarity.	Confusion over how to email over the internet.	
18	helps us connect ideas together	hard to make connections between points	
19	I gained understanding by re presenting ideas as as structured sentences rather than fragmented notes	I did not always have time to do the TAs right after class	
20	Another way, there was a lot of material that was covered in class, and the TA was helpful because it helped us focus on major topics and bring all the subtopics together by relating them to one another.	Another aspect was that I had hard time writing the materials in full sentences because in class, we discuss so much materials and I would make bad sentences.	
21	The next positive outcome would be that as I was writing about the class I would think more in depth about whatever topic was for the day.	The next negative aspect was the fact that I wasn't able to use bullet points to organize my thoughts further. The use of bullet points with full sentences would have made reading my "Take Aways" more useful for myself and easier to find certain facts instead of searching through a mass of words.	I would really allow bullet points next time.
22	I was able to comprehend the material better.	Sometimes I felt blank on what to write about even w/notes present.	I would force myself to try and enjoy writing the TAs instead of thinking how daunting writing a TA could be.
23	Summarizing. I thought it was very helpful summarizing our notes into essay format because it helped me with exams and I retained the information better.	Not being long enough. A lot of my TAs for the second round were "about" a page, but I needed at least one more paragraph for each. I did not know what else to include, so I had points taken off for something I thought was pretty well written.	

**Table B2: Second Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 2</b>	<b>NEGATIVE ASPECT 2</b>	<b>SOLUTION 2</b>
24	The information gathered was in my notes but more organized	TA's are journals meant for my own use and only for my eyes. I did not like being told how to write in my own journal.	Allowing us to write these journals the way we want. <a href="#">Note: the use of the term Journal should be eliminated: executive summaries?</a>
25	I very much enjoyed analyzing convergent and divergent thinking...		
26	It benefited my note-taking abilities and I used these "new and improved" skills in other classes.	Notes were a challenge to take in this class, and sometimes it was difficult to make sense of what I had written.	Because notes were hard to take I started bringing my computer to class since I can type faster than I write. This helped me catch more of what was said
27	Another positive thing about them is that it keeps you up to date and on track with the class, even if you are not there you can refer to Dr. Carifio's emails to fill you in on what was discussed that particular day.	Another major issue is the fact that it has to be done a certain way. A "study guide" I believe should be done in a way that helps the individual, because everyone has a different learning and study method.	
28	I have become better at understanding and creating text from notes taken in class. This makes me understand the material more and helps me retain information	I found it very frustrating when I related the subjects, but had to reduce them if it was only a few sentences long. It was very frustrating because when you put so much effort into something and have to reduce it gets to be annoying and tedious;.	
29	Feedback is one of the best aspects about the TAs. Not everyone enjoys constructive criticism, but it helps when we want to learn new things.	Missing class made it a little difficult to reflect back.	
30	Forced me to look over my notes which I otherwise might not have done.	Too many rules I tried to pay attention to, which got me sidetracked and confused sometimes	
31	Being able to connect past lessons to present lessons.	Hard to summarize topics if I didn't take enough information down in my notes. To solve this, I could take better notes by paying better attention in class.	To solve this, I could take better notes by paying better attention in class.

**Table B3: Third Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

Ss	POSITIVE OUTCOME 3	NEGATIVE ASPECT 3	SOLUTION 3
02	I learned that I could do something I had .strong negative feelings about and still have an <u>overall positive experience.</u>	Studying from "essay form" TAs did not instill the same sense of retention and mastery as it did when <u>using the "bullet- point form."</u>	c. Decide on the actual point/goal of the take-aways. I think that the bullet-points are best. Connections to other course material can still be mandated.
03	Helped me get better at organizing key points into a coherent goal (whole?)	It wasn't always easy to make them structured because Dr. Carifio's teaching style is a lot different than most professors I've had. <u>(I'm a marketing major).</u>	To fix that, I just tried to take detailed notes.
04	Pushed me to come to class; because attendance isn't mandatory, but I didn't want to get points off for <u>not doing the takeaways.</u>	Sometimes I'd forget to do them since they were not due at the end of class, <u>rather than at the end of the round.</u>	
05	— Seeing cognitive processes in a wider scope because it is applicable to my society. The Take Aways have been successful in its goal to be something that helps you take away a little extra from the class... it intrigued me more in the material because I now knew the causes and <u>potential damaging effects. see #2</u>	Sometimes you may feel more in depth w/one lecture, than the other.	
06	Can be used as a studying tool for exams.	I had a hard time when I missed class because I wasn't sure what I missed. Instead, I would write about an article from an email Dr. Carifio sent and hope I wasn't missing important information from class.	I also should have attended every class to make sure I had all the information necessary to relay in my takeaway. I would just rather have class notes so I know exactly what's being taught I would have the most direct source to me. class material (class itself) <b>However</b> , due to health reasons that wasn't always possible so I did the next best thing and <u>read articles on cognitive psychology</u>
07	During class I was taking notes and not writing neatly, so doing the TAs helped me become more organized and neat.	NONE	

**Table B3: Third Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

Ss	POSITIVE OUTCOME 3	NEGATIVE ASPECT 3	SOLUTION 3
08	—If a concept is fuzzy or unknown it forces an individual to research on <u>their own to further understand</u>	—TA's can easily be forgotten until the last minute because they are not mandatorily collected	
09	The third positive thing is that when we related the information to our own lives I believe it could help improve the connection of the information to our own LTM which can help us to recall the information better and for a <u>longer amount of time</u> .	The third negative, but least important, involves the ceaious (?) markings. An example of this is "Psych" or "Prof." Even though a journal would be considered less formal, we would still have to write out <u>words like those</u> .	
10	By writing the journal entry each day after class, the materials aren't so overwhelming as if I were to reflect back the day <u>before an exam</u> .	The TA's can be timeconsuming if you're having an off day and the work load from your other classes is <u>starting to take a toll on you</u>	Although I may not know what will be discussed in the following class, I can at least start on the work of the other classes ahead of schedule so I'm not stuck with a heavy load of work at the end of the week. This will <u>also help eliminate any stress and doing all nighters</u> .
11	Thirdly, it was a good challenge and a new experience that grew each of the three rounds	NONE There were only two problems I encountered with the takaways.	Overall, they were beneficial and provided a good study guide & analysis of what I understood & what I needed to work on. Doing these journals helped me <u>remember these concepts easier</u> .
12	They pushed me to go to class because I knew how important my notes were in order to write a <u>good TakeAway</u> .	I feel that the TA took too much time, correcting them and stressing about it. I had to re- <u>write mine way too many times</u> .	I don't think it should be so strict To fix this, I would make it a journal but not so serious. Although, she was very nice about it!
13	The 3 <sup>rd</sup> positive outcome was it was a way for me to organize my notes, take away what I thought was important, then when Shanna gave them back I had something good to <u>study from</u> .	One more negative aspect would be that altho Shana did a great job with feedback, I think that she was very critical about grammar and spelling <u>mistakes</u> .	I think more of the focus should have been on the content of the TAs, rather than if words are spelled right or letters have been capitalized. Maybe next time around, she could be more lenient? :-)
14.	Organized my notes.	Often had trouble trying to write a full page.	<b>Thanks for a Great Semester!</b>
15	Touching on materials again after a lecture better than my usual strategy (i.e. not touching on them again...)	No immediate feedback	Fix? Essays are hard to grade, outlines/bullets less difficult

**Table B3: Third Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject (N=30).**

<b>Ss</b>	<b>POSITIVE OUTCOME 3</b>	<b>NEGATIVE ASPECT 3</b>	<b>SOLUTION 3</b>
16	Not due after every class. Due in periods_throughout the semester.	Not much of a tool for us. Used to ensure we understood the material.	
17	Developed better writing skills.	Difficulty printing in a manner not costly	
18	helps organize thoughts	information got confused and sometimes unorganized	
19	I have a record of the course material in TA form	I did not meet all of the rubrics requirements but I still put the time into the material	
20	Through the TAs, I learned to relate materials with some kind of correlation or relating it to something I know.  This made it easier to understand	Another aspect that was negative was I was having hard with relating topics to things we know currently	I solved this by concentrating harder, and letting the information flow.
21	Related to the second outcome, the third outcome that was positive was that relating the topics to my personal life helped me to gain more insight on the topic and more easily remember it for the future.	The third problem would be just the sheer number of "Take Aways." I felt that sometimes just trying to find the time every night to do them got difficult sometimes.	In conclusion, I would change the grading to allow bullet points as well as stick with one grading scheme.
22	Feedback on the TAs allowed for improvement_in writing skills_	Sometimes I found that trying to relate topics to each was somewhat_difficult	
23	Feedback. I liked how Shanna would correct misinformation if I had it. That way, I wouldn't be studying something inaccurate and end up doing poorly on the exams	OVERWHELMING. The TAs can be quite stressful for a procrastinator, like myself.	Although this was my own fault, it was added stress that I was not a fan of.
24	It allowed me to retain my writing skills and note-taking or better them.	Hassling! Especially when I had to continually revise, making me work a lot harder at the end of the semester.	Keep the one page requirement. This makes it easier and more reasonable,

**Table B3: Third Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject N=30**

Ss	POSITIVE OUTCOME 3	NEGATIVE ASPECT 3	SOLUTION 3
25	...in relation primarily to my cognitive patterns and why I developed the,. the nature-vs-nurture discussion was an opportunity to verbalize my frustration with these supposed conflicts and investigate the self-propulsion aspect of life or behavior		
26	When I missed class, and had to choose something to write about, I found loads of information on various cognitive psych topics I found very interesting	At first I was confused because I felt I had to summarize every thing that was said and it was a lot of work	Also, instead of summarizing all of what was said, I wrote about the examples we used about thing we were learning about. Using examples helps me reinforce what I'm learning and understand it more. That way, the TAs benefited me more.
27	Lastly, there is no greater study guide available! If you have taken your time & done the TA correctly you should be able to look over your work & decide what you would put on a test if you were teaching the course_	Lastly, I do not like the fact that there was one page minimum for each, because sometimes there was not much talked about in class that was pertinent to the TakeAways	
28	I was able to use my TAs to study from for exams. This made approaching exams a little less stressful.	I was ultimately confused with the overall concept of a "Take-away". The original thought was that it was to help me got lost when I kept having to redo them and got more frustrated with <u>each one</u> .	
29	Emails helped a lot with the process. There are no books specifically for class and not every thing the professor says will be embedded in the brain or caught to write notes. The emails help refresh memories.	Being under the assumption that TAs are purely my opinion instead of my opinion <u>AND</u> what did I learn in class? Was a dumb mistake!	
30	Easy way to add a good grade :)	Would have been nice to have the handwritten TAs back BEFORE the tests, so they could be used for review + to study with	
31	Putting my own experiences into perspective in connection with the day's lesson.	Nobody likes to do homework, especially me! The TA's were a great tool, and besides the fact that I don't like to do homework, <b>I think they were, overall, a positive aspect of this class!</b>	

**Table B4: Fourth Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject N=30**

Ss	POSITIVE OUTCOME 4	NEGATIVE ASPECT 4	SOLUTION 4
02			
03	In general, the TAs made me actually think about the material instead of just memorizing it temporarily for a test	NEG? I originally intended to re-integrate my TAs in an attempt to impose master order upon them but I didn't have time.	
04	I believe the TAs were a good idea. they really helped me on tests and to better understand my knowledge But (see Neg 1& 2)		
05			
06			
07			
08			
09	4. Comments are made on the TAs that are extremely helpful in terms of how to write a better essay or aware me of what I missed to be to be covered about the class that day. . 5. There's no distinct due date, and one can rewrite their work.	If I missed a day of class and wrote my TA from Dr. Carifio's email, there are 3 or 4 articles to choose from and I'm not certain which of those were discussed in class and are most important	If I'm confused as to what article I should compose my TA on, I can always ask a classmate for their notes and Compare it with the emailed articles. From there, I can decide which article has the most to write a TA on.
10			
11	I got to see feedback what I wrote quickly after I submitted to better understand what I may have sounded confused on.	Sometimes when I missed class,it was hard taking information from emails because I was not in class to take notes.	This was my fault and could have been simply changed by just attending class!
12			
13			
14			
15			



**Table B4: Fourth Ranked Positive and Negative Aspects of Take-Aways with Solutions for the Negative Aspect by Subject N=30**

Ss	POSITIVE OUTCOME 4	NEGATIVE ASPECT 4	SOLUTION 4
16			
17			
18			
<b>19</b>	Another way was helpful was we were learning new materials and writing about major themes and getting credit.		
20			
<b>21.</b>	I am able to explore new ways of approaching ideas. 5. I can make better connections to previously learned material.	The 2nd and 3rd round of TAs seemed quite similar with one and other. I was confused on achieving the differences between the two	I would suggest making a clearer distinction between the requirements of the second and third TAs
22			
<b>23</b>	Made it easier to study.		
24			
25			
26			
27			
<b>28</b>	Having more elaborated-on material to use for studying		
29			
30			
<b>31</b>	Note: <b>Student repeated</b> Neg and Solution	Nobody likes to do homework, especially me!	The TA's were a great tool, and besides the fact that I don't like to do homework, <b>I think they were, overall, I think positive aspect of this class!</b>