Trekkies have it better: The effect of accumulated experience-taking on the performance of logic tasks

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INTRODUCTION

When a person engages in experience-taking with a narrative's protagonist, their attitudes/behaviors tend to become more in line with those of the protagonist (Libby & Kaufman, 2007). However, research has yet to examine how fans can access previously stored experience-taking instances without requiring immediate engagement with a narrative, termed "accumulated experience-taking (AET)". To test this theory, we measured self-reported AET during the study and a general measure of AET in life. In study one, fans and non-fans of Star Trek (i.e., trekkies/non-trekkies) answered logic questions and rated their experience-taking after an excerpt about Vulcans. Results demonstrated higher levels of accessed immediate AET increased performance on difficult questions when accounting for general AET and perspective-taking. This effect was moderated by the number of Star Trek series the participant had watched.

In study two, participants from Baruch College were asked to generate their own 'logical character'. They were asked to think of a logical character of which they were familiar and answer a few questions that probed for information about the character they chose and the T.V. show on which this character was created. In order to measure changes in logical performance, they completed standard SAT math problems before and after generating their logical character. They were provided with an online calculator that they were told to use to complete the problems. They also answered questions about immediate AET, general AET, and perspective-taking. Once again, immediate AET predicted an increase in performance of difficult math problems after accounting for general AET, perspective-taking, and the percentage of the series watched. This relationship remained strong after accounting for math performance before the experience-taking probe.

CONCLUSION

In summary, it appears that being able to engage in experience-taking with a well-known logical character, can increase performance on a logic task using previously stored information from memory. The character could be provided by the researchers, such as the first study which engaged the participants to remember Vulcans from *Star Trek,* or the reader could generate their own character, such as the second study in which participants chose their own logical character. After these characters were introduced, performance on difficult math questions improved.

Immediate AET had no effect on easy math questions. Furthermore, the effect of immediate accumulated experience-taking (AET) on difficult questions appeared after accounting for other variables, such as perspective-taking, exposure to the show, and general AET. These additional factors may hint at a multifaceted relationship between experience-taking and perspective-taking; a relationship we hope to explore in the future.

Future research will examine this performance for other types of logical tasks. We also plan to compare immediate AET on logical vs. non-logical characters in order rule out that immediate AET improves performance regardless of the logic of the character.

STUDY ONE METHODS

Ninety-seven participants completed this study on Mturk for monetary compensation.

Vulcan Description
Participants read a short description taken from Wikipedia (https://en.wikipedia.org/wiki/Vulcan_(Star_Trek)) that informed the reader of the typical Vulcan personality and lifestyle.

Logic Questions
Participants answered 3 easy and 4 difficult multiple choice math questions to assess logical thinking.

Accumulated Experience Taking Inventories
Two inventories measured experience-taking. The immediate AET inventory assessed how strongly the participants felt as though they were having a "Vulcan experience" while taking the study. The general AET inventory assessed whether participants have had a "Vulcan experience" in the past when NOT watching the television shows or movies.

Perspective-Taking
Six questions measured the degree to which participants engaged in perspective-taking with the Vulcan identity while completing the study. The perspective-taking measure asked about the extent the participant puts themselves in the shoes of a Vulcan, a phenomenon distinct from experience-taking, as experience-taking relates to reduced self-awareness and an adoption of a Vulcan identity.

Star Trek Exposure and Identification
Two questions assessed exposure and identification with Star Trek. To assess exposure, participants reported the number of Star Trek series that they watched based on their own free will. To assess identification, they rated themselves on a scale of "Trekkiness".

Star Trek and Vulcan Knowledge
Participants answered multiple choice Star Trek questions (e.g., "Which race invented the cloaking device?"). In order to examine Vulcan knowledge, participants were asked to answer 24 True/False questions as a Vulcan would (e.g., "Emotion is for the weak").

STUDY TWO METHODS

Baruch College students completed this study online for class credit. Eight participants were removed after admitting they did not follow instructions to use a calculator. The pre-screening required English fluency by age 6 as a requirement, but 22 participants stated after the study that they did not fulfill this requirement. These participants were also removed.

Math Questions
Participants answered 6 easy and 6 difficult math questions taken from an SAT practice manual. They were told to use a calculator when answering these questions (and were provided with a link to an online calculator).

Logical Character Generation
Participants were asked to think of a logical character from T.V. show that they are highly familiar with and write that character's name. They then answered questions about the character, such as what show they were from, where the character worked, and names of family/friends of the character. After the other inventories, they stated the percentage of the show they watched and rated their perception of their character's logic.

Math Questions
Participants answered 12 more math questions, 6 easy questions and 6 difficult questions.
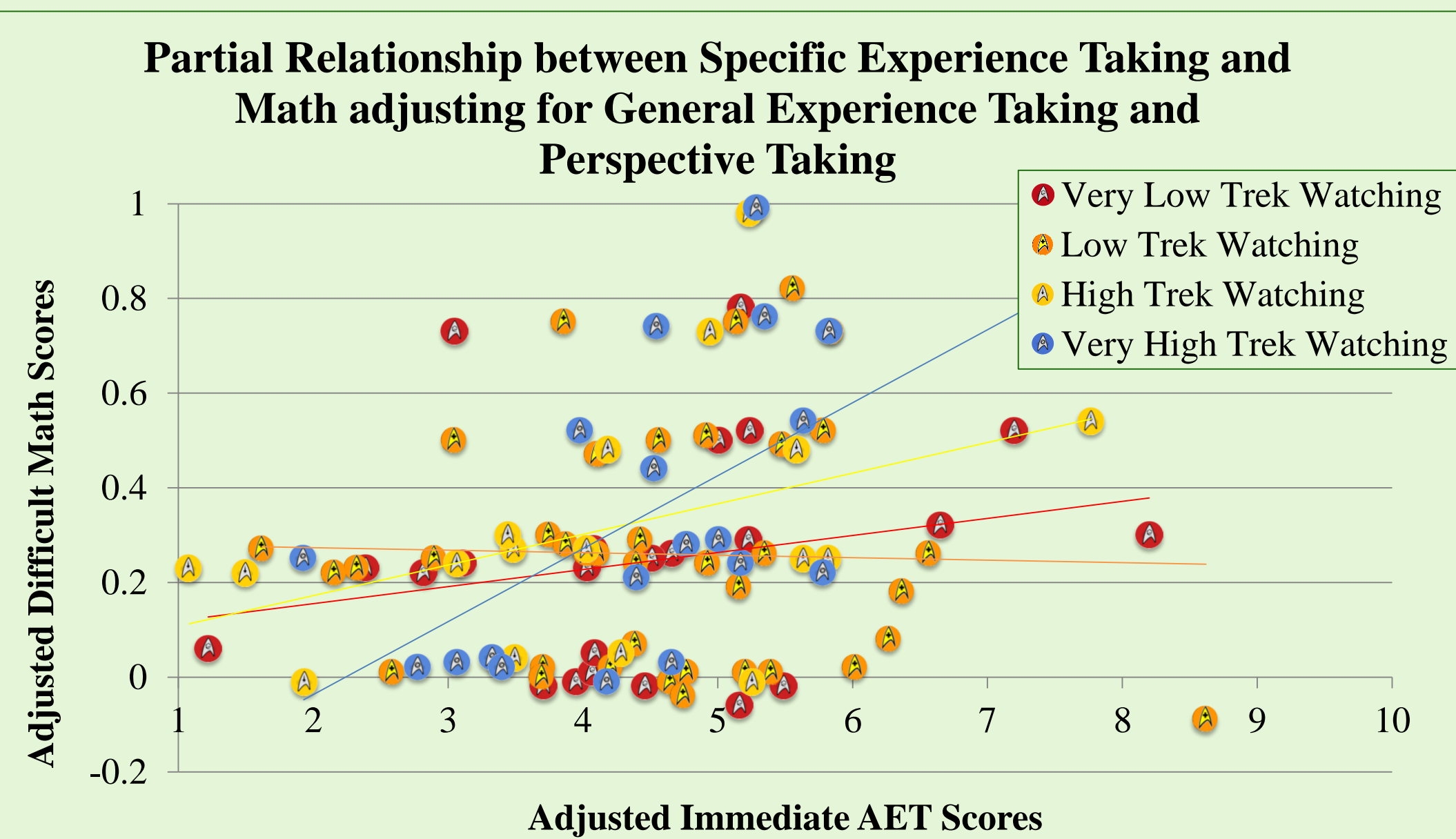
Accumulated Experience Taking Inventories
Two inventories measured experience-taking. The immediate AET inventory assessed how strongly the participants felt as though they were behaving as the character while taking the study. The general AET inventory assessed whether participants have had an experience in the past of behaving as the character when NOT watching the television shows or movies.

Perspective-Taking
Six questions measured the degree to which participants engaged in perspective-taking with the chosen character's identity while completing the study, asking to what extent the participant put themselves in the shoes of the character.

STUDY ONE RESULTS

When accounting for general AET, and perspective-taking, greater immediate AET related to higher scores on the difficult math questions. This interacted with watching more Star Trek series, where scores increased with a greater number of series watched.

Partial Relationship between Specific Experience Taking and Math adjusting for General Experience Taking and Perspective Taking

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.[c]
1 Regression	.596	4	.149	2.349	.060[c]
Residual	5.839	92	.063		
Total	6.436	96			
2 Regression	1.042	5	.208	3.517	.006[d]
Residual	5.393	91	.059		
Total	6.436	96			

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.304[b]	.093	.053	.25193
2	.402[c]	.162	.116	.24345

Coefficients[a]			
	Standardized Coefficients		
Model	Beta	t	Sig.
1 (Constant)		10.802	.000
General AET	.025	.172	.864
Perspective	-.282	-1.835	.070
Immediate AET	.370	2.280	.025
# Trek Series Watched	.182	1.827	.071
2 (Constant)		11.281	.000
General AET	.008	.057	.955
Perspective	-.306	-2.060	.042
Immediate AET	.377	2.403	.018
# Trek Series Watched	.175	1.821	.072
IAET by Series	.265	2.743	.007
a. Dependent Variable: Difficult Math Questions			

STUDY TWO RESULTS

When accounting for general AET, perspective-taking, and the percentage of the show that was watched, greater immediate AET related to higher scores on the difficult math questions. Unlike the first study, the interaction was not significant between immediate AET and the percentage of the show watched. However, the effect still held after accounting for performance on math questions before the manipulation.

Partial Relationship between Immediate AET and Difficult Math
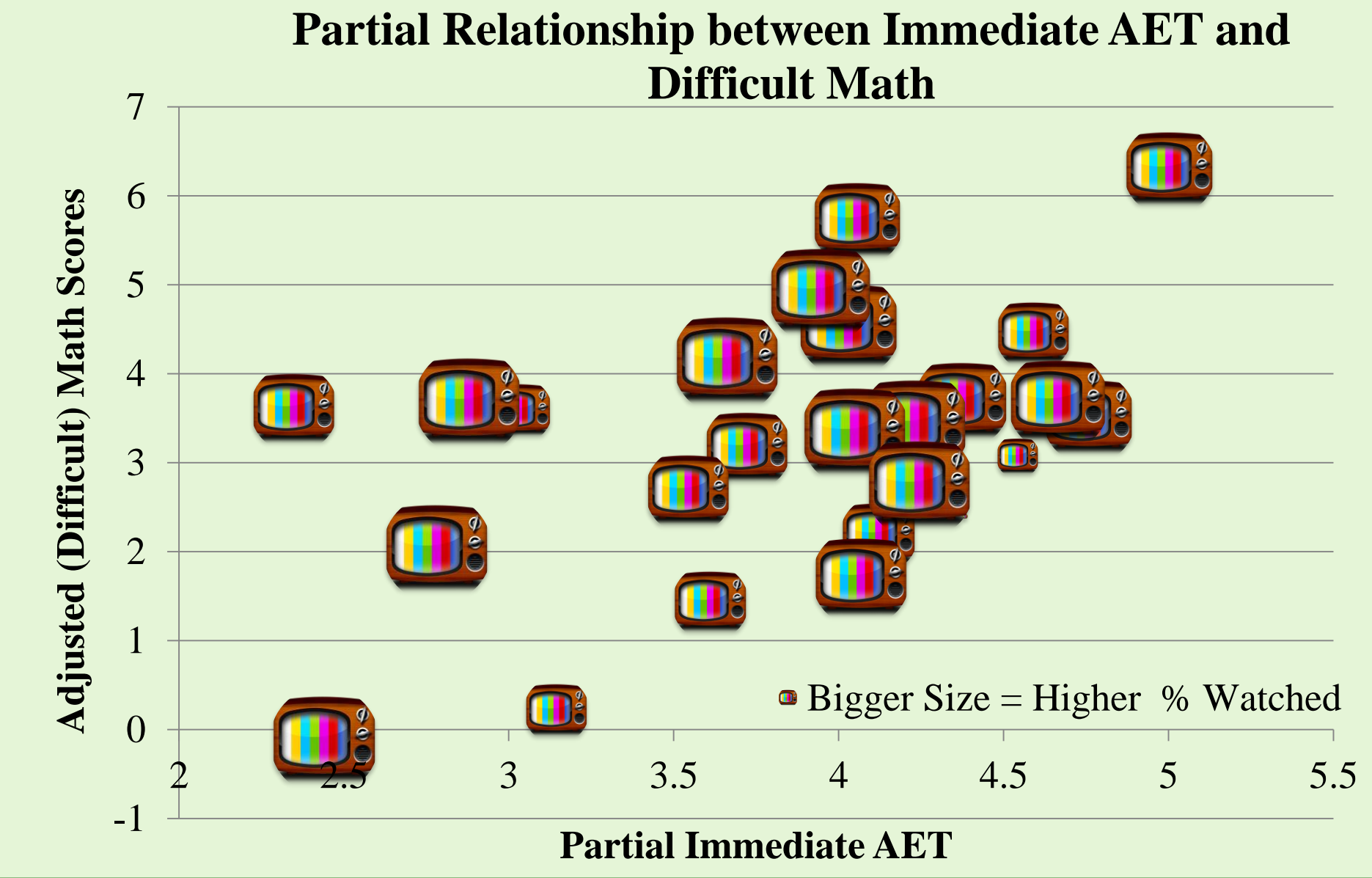
ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.[b]
1 Regression	26.843	5	5.369	2.745	.050[b]
Residual	37.157	19	1.956		
Total	64	24			
2 Regression	28.554	6	4.759	2.417	.069[c]
Residual	35.446	18	1.969		
Total	64	24			

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.648[a]	.419	.267	1.39844
2	.668[b]	.446	.262	1.4033

Coefficients Difficult Math			
Model	Standardized Beta	t	Sig.
(Constant)		3.09	0.006
Pre-Math	0.411	2.107	0.049
Perspective Taking	0.344	1.231	0.233
General AET	-1.071	-2.525	0.021
Immediate AET	0.928	2.681	0.015
% Watched	0.276	1.461	0.16
(Constant)		2.567	0.019
Pre-Math	0.368	1.831	0.084
Perspective Taking	0.299	1.052	0.307
General AET	-0.898	-1.935	0.069
Immediate AET	1.033	2.829	0.011
% Watched	0.319	1.635	0.119
IAET by % Watched	-.297	-.932	.364