Future FELLOWS

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Change in Policy

Access to Syllabus Readings

Readings listed as "Online Publications" in the syllabi for Exams 3L and 5-9 are accessible by CAS members and active candidates with a user name and password. Active candidates are those candidates who registered for a CAS exam within the past two years.

Members and active candidates who have forgotten their password can use the Forgot Your Password feature to update their password. Please contact the CAS Actuaries' Resource Center (arc@casact.org or 703.276.3100) with any problems accessing the syllabus readings.

Clearing Up Confusion on Appeals

By Steven D. Armstrong, FCAS, Examination Committee Chairperson

In reviewing a record number of appeals earlier this year, it was evident to the Examination Committee that there is still a misunderstanding about the role of the appeal process. Here are the basic concepts:

1. All papers close to the pass mark have been graded multiple times. The appeals process cannot be used to have your paper re-graded.
2. After the sample solutions and the Examiners' Report have been posted, if you have an alternative answer that is responsive to the question, then you may submit it as an appeal. You must provide specific details on why the alternative solution is correct. The appeal would be reviewed with one of the following outcomes:
   - The submission is not an alternative solution and it will not be considered by the committee. (This allows the committee reviewers to devote their time to evaluating and researching valid appeals.)
   - It has the potential to be an alternative solution and will be considered by the committee. The appeal will be "double blinded," i.e., neither the name nor the candidate number will be used, so the committee would not be able to look at the candidate's paper—it would only consider the alternative solution as it is presented in the appeal.
3. The appeals that are considered by the committee will be sent to the Part Chair and the graders of the question. The proposed alternative will be researched.
4. After the research has been reviewed, the officers will make one of the following determinations:
   - The candidate did not propose an alternative answer that was fundamentally different from the sample answer that was released. Therefore, this appeal would not result in any re-grading of candidate papers.
   - Although it was not among the published sample solutions, this alternative answer was evaluated and accepted during the grading process. It was, therefore, part of the original grading rubric. This appeal would not result in a change to the grading rubric or the scoring of this question.
   - The alternative answer that was submitted had been evaluated during the grading

⇨ turn to page 3

Dates to Remember

Exam Registration Deadlines

Exam 1/P (March)
January 31, 2013

Exam 3F/MFE (March)
January 24, 2013

Exams 3L, 5, 7, and 9
March 21, 2013

Exam 2/FM (March)
January 24, 2013

Exam 1/P (May)
April 2, 2013

Exam 4/C (February)
December 20, 2013

Exam Refund Deadline

Exams 3L, 5, 7, and 9
April 26, 2013

CAS Seminars and Meetings

Ratemaking and Product Management Seminar (RPM)
Huntington Beach, CA
March 11-13, 2013

Enterprise Risk Management Symposium (ERM)
Chicago, Illinois
April 21-24, 2013

CAS Spring Meeting
Vancouver, BC
May 19-22, 2013

Seminar on Reinsurance
Southhampton, Bermuda
June 6-7, 2013

Exam Process Overview

By Dan Tevet, FCAS, Candidate Liaison Committee

There is much uncertainty surrounding actuarial exams. Will this paper be tested? What will the pass ratio be? How hard is the next exam? Unfortunately, we can't help you with any of those questions. But, the process to create, implement, and grade an exam can be illuminated.

Note that this article only pertains to the upper-level exams (5 through 9).

At the most fundamental level, the exam process begins with the CAS Board of Directors and Executive Council. The Board sets basic education policy for the CAS, while the Executive Council oversees operational issues. In determining basic education policy and operational issues, the Board and Executive Council incorporate feedback from the Examination Committee, the Syllabus Committee, the Education Policy Committee, as well as various task forces that have been commissioned.

Once the education policy objectives have been outlined, it is up to the Syllabus Committee to create the exam syllabi. This involves determining learning objectives, knowledge statements, and selecting readings for each syllabus.

Creating an Exam

Now we're at the fun part—creating an upper-level CAS exam. Before we get into details though, it is helpful to clarify the structure of the Examination Committee. The Examination Committee is the largest CAS committee, and the vast majority of committee members are assigned to one specific exam, either as a part chairperson, a vice chairperson, or a member. You can think of each exam as essentially being its own subcommittee. The remainder of the Examination Committee is comprised of the chairperson, assistant chairperson, consultants, and a handful of general officers. (Side note: If you know that someone is a member of the exam committee, do not ask which exam they work on. Examination Committee members can only confirm that they are on the committee—they are prohibited from providing any further detail.)

Based on the learning objectives, knowledge statements and syllabus readings, members of each exam subcommittee create several test items (questions). The items are written in pairs—that is, two members are assigned selected learning objectives and must jointly create questions based on those objectives. For each question they create, the item writing teams also propose the point value, a minimally qualified candidate score, a suggested response or responses, a grading rubric, and various diagnostics such as Bloom's level and estimated time to fully answer the question.

Once the item writers have completed their questions, it is time to compile the initial draft of the exam. The process for doing this is actually evolving, and there are currently differences in how the various exams are produced. Historically, the part chairperson, vice chairpersons, and several experienced members of each exam subcommittee would create a draft exam. Recently, however, item writing summits have been held for Exams 5 and 6. All item writers for that exam are invited to attend the summit. The CAS is in the process of assessing the feasibility of conducting item writing summits for all upper-level exams.

After the initial draft exam is created, it is sent to consultants on the Examination Committee. Consultants are generally actuaries who are experienced members of the Examination Committee. The consultants review the proposed exam and recommend changes or improvements to the test items.

The next step involves assessing the exam in its entirety. It is presented to a recent Fellow or Fellows who played no role in creating the draft exam. The purpose of this step is to review the exam from a more critical "candidate" eye. The process helps the exam committee assess the length of the proposed exam and change or clarify questions based on feedback. The exam is also sent to a copy editor to check the spelling and grammar of each item.

The final draft of the exam is then submitted to the general officers and chairperson of the Examination Committee for approval. The proposed exam is also sent at this point to the pass mark panel, which helps to determine a preliminary pass mark for each exam as well as provide any other feedback.

Exam Administration

Now we've reached everyone's favorite step—exam administration! Around early May and late October of each year, actuarial candidates around the world sit for the exams that have been meticulously drafted by the Examination Committee. (This is generally followed by drinking heavily, but that is the subject for another article.)

A (hopefully) infrequent, but very important step after exam administration is identifying defective questions. The Examination Committee works very hard to construct an error-free exam, but unfortunately invalid or incomplete questions do sometimes make it into an exam. If you believe that you have identified a defective question on an exam, please notify the CAS of the suspected error within two weeks of the exam.

After the exam responses are returned to the CAS Office, sorted, photocopied, and sent to the graders, the most labor-intensive portion of the process begins—exam grading. In the weeks after the exam is administered, each question is evaluated by a grading pair or triplet who must agree on each candidate's score within some small margin. Note that the graders may or may not have been involved in writing exam questions. Once all papers have been initially graded, the

⇨ turn to page 3

Exam Process Overview

from page 2

committee members meet in a central location to finalize scores for each candidate. At this point, the grading teams must agree on a final score for each candidate near the pass mark. This is an iterative process in which candidate papers that are within a few points of the pass mark are re-graded (and re-graded) to ensure an accurate score.

Grading the Exam

Finally, based on the advice of item writers, graders, consultants, and the pass mark panel, as well as candidate performance by question, the Examination Committee recommends a proposed pass mark score for the exam. For each exam, the part chairperson creates a summary report that includes the proposed pass mark score and key statistics. The report is submitted to the vice president-Admissions for approval. Then comes everyone's second favorite part of the exam process—anxiously awaiting results while hitting Refresh on the CAS website every few seconds!

For further information on the exam process, we encourage you to review past *Future Fellows* articles on exam-related issues and to read Pat Teufel's open letter on the Fall 2011 exam results. If you have any questions on the exam process, please feel free to complete the Candidate Liaison Committee Feedback Form: (http://casact.org/newsletter/index.cfm?fa=feedback&et=1&dom=03272008&ml=admis).

Clearing Up Confusion on Appeals

from page 1

process but was not accepted. Upon review, it was determined that the original judgment applied during the grading process was appropriate and the appeal would be denied.

- The proposed alternative solution is a reasonable alternative approach and was accepted during the appeals review. The grading rubric would be changed to include the alternative answer and candidate papers would be re-graded.

5. Even if your alternative solution is accepted, it does not mean that your actual response would gain enough points to have your grade changed. (Conversely, since other papers would be re-graded, it sometimes happens that a person who did not submit an appeal could have his or her score changed enough to have his or her grade changed to a Pass.)

Sharing Results of Exam Start-Time Survey

By Alicia Gasparovic, ACAS, and Dan Tevet, FCAS, Candidate Liaison Committee

The Candidate Liaison Committee (CLC) recently posted a survey on the CAS website asking candidates for their opinions on exam start times. The committee wishes to thank the nearly 1,000 responders who took a few moments to answer the survey questions and provide comments.

Based on the survey results, the CAS will keep the current 8:30 a.m. start time intact.

The majority of responders indicated that the current 8:30 a.m. exam start time is optimal (with 9:30 a.m. as a runner-up). Some exam-takers even noted current cognitive research concluding that exam performance is best in the morning hours. In fact, only 20 percent of responders stated they were not at least somewhat satisfied with the current start time. Items cited as motivation for pushing start times either earlier or later include extreme hunger by the end of the exam, not being awake so early in the day, and rush hour traffic causing morning travel delays.

One survey question asked candidates whether they would consider implementing a rule essentially locking out late arrivers in order to ensure timely exam starts. An overwhelming "No!" was heard loud and clear by the committee. Candidates' responses indicated a high degree of forgiveness of latecomers, especially when considering the personal costs to the locked-out individual (months of additional study time, delayed promotions or salary increases, increased burden on family members, etc.).

Lastly, many of the survey responders left comments either about start times or the exam process in general. One of the missions of the Candidate Liaison Committee is to assess the opinions of CAS candidates and to convey them to the Examination Committee and to CAS leadership. Thus, we encourage candidates to submit whatever feedback they have about the admissions process (or really any actuarial topic) via the CLC feedback form on the CAS website (http://casact.org/newsletter/index.cfm?fa=feedback).

We obviously cannot guarantee that your every wish will become official CAS policy, but we do guarantee that every comment will be read and passed along to the appropriate persons.

Predictive Modeling—You Mean Actuarial Wizardry?

By Shane Barnes, FCAS, Candidate Liaison Committee

As far as "hot topics" in insurance go, predictive modeling has been one of the dominating topics over the past decade. This set of analytical tools has transformed the way that many actuaries work and has ushered in a new era of rating products. Predictive modeling will continue to shape the industry and direct future analytical developments. A basic understanding of this increasingly important specialty is essential for all actuaries—even those currently practicing in non-pricing roles.

What is Predictive Modeling?

When the term "predictive modeling" is mentioned, some may think it is crazy actuarial wizardry. But I assure you, it's far from wizardry. It is, in fact, a more sophisticated way of handling insurance data than performing simple one-way analyses.

The core definition of predictive modeling is that you are using past data to predict the probability of some future outcome. Actuaries have been performing predictive modeling exercises for decades, the difference from recent development being the statistical rigor around the analytics.

Working with insurance data poses several unique challenges. For example, only a small portion of the insured population in any given term experiences a claim, and when a claim does occur it tends to be large. A typical insurance dataset has a significant proportion of zero-dollar loss amounts with large spikes when losses do occur. Many traditional statistical methods, like simple linear regression, assume that data follows a Normal distribution. Insurance data, conversely, is far from the Normal, and benefits greatly from more advanced statistical methods.

In the actuarial world, predictive modeling has become almost synonymous with generalized linear models (GLMs). However, GLMs are only one aspect of predictive modeling. Other examples are statistical clustering (particularly with geographic variables), Classification and Regression Trees (C&RT) analysis, price optimization, or even actuarial rate or reserving indications.

Are You Sure it's not Actuarial Wizardry?

Many people that I talk to are unsure about predictive modeling and how it can relate to their everyday work. Predictive modeling often brings them back to the heavy mathematical manipulation they needed to perform on exams. Is there complex math being performed within predictive modeling? Absolutely, but luckily there are a handful of statistical software packages that will perform the calculations (such as R or SAS). You will need to be able to understand the statistical tests, but these tests are similar to what you would have learned in your college statistics course. However, I think it is important to understand some of the math that goes into predictive modeling. This will allow you to better understand the assumptions and results.

Predictive modeling is just as much of an art as it is as a science. Building a predictive model and interpreting the results is not just a statistical exercise; rather, to be a successful modeler (and actuary), you should strive to understand the relationships within your model and relate them to real-world business problems.

How Do I Become Proficient in Predictive Modeling?

There are several things you can do to increase your knowledge of predictive modeling. GLMs are by far the most widely used form of predictive models in the actuarial world, so that is a good place to start. Start reading some of the popular texts that are referenced at the end of the article. It's important to understand the theory underlying predictive modeling (plus you'll need them for the Advanced Ratemaking exam).

Another valuable approach is to talk with colleagues who work on predictive modeling. When I was first learning how to build predictive models, I had a few mentors who showed me the ropes, and their help was invaluable. Additionally, the Ratemaking and Product Manager Seminar that the CAS hosts every spring is a great meeting for those interested in predictive modeling.

Of course, the best way to learn predictive modeling is to actually build predictive models such as GLMs and test some models. There is a plethora of real-world business problems that can be addressed using predictive modeling. Many people associate GLMs with massive projects and year-long timelines, but in reality, such projects are a small portion of predictive modeling work. Most of the models I

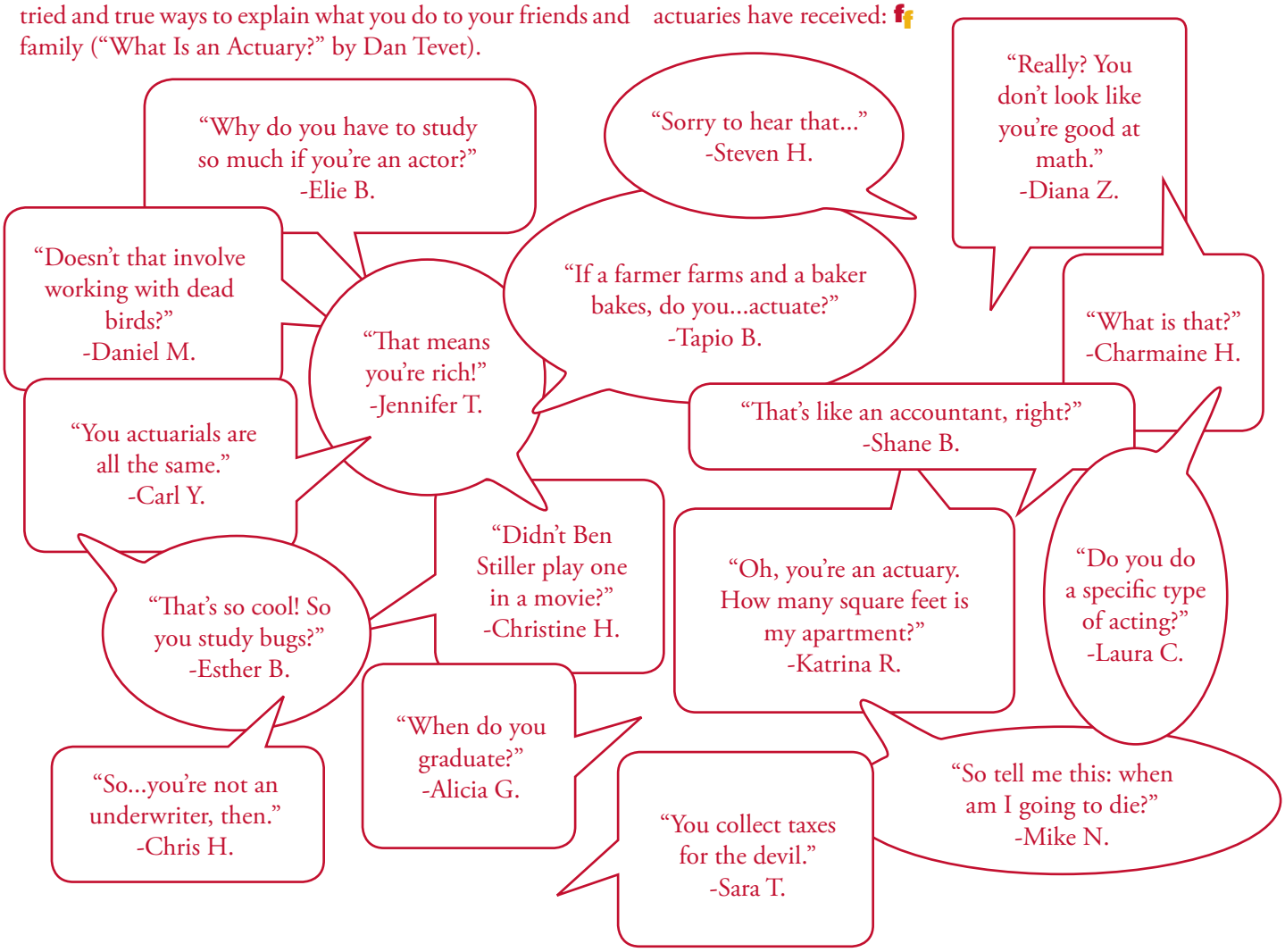
⇨ turn to page 6

"So When Am I Going to Die?"

By Katrina Redelsheimer, ACAS, Candidate Liaison Committee

Here at *Future Fellows*, we strive to bring our readers the crucial information they need to succeed as actuaries. Last issue, we covered the latest scientific methods for determining whether you are in fact an actuary ("You Might Be an Actuary" by Suzy Poole). Last year, we walked you through tried and true ways to explain what you do to your friends and family ("What Is an Actuary?" by Dan Tevet).

Now we approach the fundamental question of actuarial identity from a new angle: What does everyone else think we do? How does the average civilian react when learning that he or she is in the company of an actuary? Our comprehensive, national survey effort revealed the following real responses actuaries have received:



Joint Preliminary Actuarial Examinations: Announcement

At its October meeting, the SOA board accepted the recommendation of its leadership team to withdraw from the Joint Preliminary Actuarial Examination Agreement with the CAS as of December 31, 2013. The CAS anticipated this action and developed contingency plans accordingly. Details are available on the CAS website.

CAS Announces Inaugural Class of CERAs

The Casualty Actuarial Society (CAS) is pleased to announce its inaugural class of candidates who have earned the CERA (Chartered Enterprise Risk Analyst) credential. The international credential identifies actuaries who meet stringent education requirements in enterprise risk management (ERM) and are governed by a strong code of professional conduct.

The fall 2012 class includes:

Avraham Adler, FCAS, CERA
David Patrick Moore, FCAS, CERA
Vikas P. Shah, FCAS, CERA
Jared G. Smollik, FCAS, CERA
Bryan C. Ware, FCAS, CERA
Sandy Wu, FCAS, CERA

As Fellows of the CAS, these individuals completed the following additional educational requirements for earning the credential with the CAS:

- Successful completion of the three-day CAS Enterprise Risk Management and Modeling Seminar for CERA Qualification.
- Achievement of a passing score for Exam ST9, Enterprise Risk Management Specialist Technical, of the Institute and Faculty of Actuaries (U.K.).

These new CERAs will be recognized during the 2012 CAS Annual Meeting, being held in Lake Buena Vista, Florida, at the Walt Disney World Swan Hotel, November 11-14.

Details on the CAS CERA program can be found on the CAS website at http://www.casact.org/CERA/.

Predictive Modeling—You mean Actuarial Wizardry?

from page 4

build take only a few hours to create and help me understand some of the everyday challenges I face as an actuary.

What's the down side?

In my opinion, the hardest part of building predictive models is collecting good data. A model is only as good as its data. Good data is critical to obtaining the correct answer.

When you build a model, regardless of your proficiency, have someone peer review your work. This sounds like a basic concept, but you will always learn something from a peer review. A peer review may provide you with new avenues for investigation. If you second-guess your work, ask someone for help. Even if you are having troubles making a relationship work, having someone look over your work can benefit the overall model.

You also need to thoroughly understand the assumptions underlying your model. What is your dependent variable (a.k.a. response variable) and what is your weight? For basic predictive models, these questions are straightforward, but not every model you build will be basic. Understanding the assumptions in the model will help you build the correct model. Unfortunately, a wrong assumption can lead to an unsatisfactory model.

Use intuition when building a model. My college stats professor once told me that if you can't explain a model result to a non-math person, then either the relationship doesn't exist or you need to refine your explanation. Insurance is all about relationships. If you cannot think of a logical reason why something should be in a model, talk with a colleague and decide if it is truly predictive, or is behaving as a proxy for another variable. Conversely, don't over-complicate a model just for the sake of complexity. As actuaries, we can show vulnerability in our work product if we don't clearly articulate and explain our analytics.

Lastly, challenge the status quo. If you are updating a model that someone else built, make sure you agree with their assumptions and their inputs. Always think about ways to improve the model. In order to advance the science we need to come up with better ways to perform and improve the analysis.

Predictive modeling represents the past, present, and future of actuarial science. Hopefully you are eager to incorporate it into your own work now that it looks less like actuarial wizardry and more like actuarial science.

I would like to acknowledge other members of the CLC committee who provided valuable feedback and thoughts in writing this article, Shira Jacobson, FCAS, and Dan Tevet, FCAS.

Reading List:

Practitioner's Guide to Generalized Linear Models (http://www.casact.org/pubs/dpp/dpp04/04dpp1.pdf)

GLM Invariants (http://www.casact.org/pubs/forum/11sumforum/Klinker.pdf)

Applications of the Offset in Property-Casualty Predictive Modeling (http://casact.org/pubs/forum/09wforum/yan_et_al.pdf)

Editor's Note: Additional readings are listed in the online version of this article.

From the Examination Committee

Remember—and Protect—Your Candidate Number

As candidates have learned over the years, you must have your candidate number in order to know whether you passed your exam when the list of passing candidate numbers is posted online. Because you cannot obtain your candidate number by phone or e-mail, it is important to hang onto it until you have received your grade report.

It is also prudent not to publish your candidate number on sites such as Facebook or discussion forums. The number is for your own personal use. The Examination Committee is very careful to ensure that all exam responses are "blinded" so that the graders and officers do not know the identity of any candidate during the grading process. A candidate number that is posted online could inadvertently be observed by a grader, and the grader's knowledge of that person could unconsciously affect the grading of a response. The Examination Committee would prefer that your candidate number be kept "for your eyes only" to ensure that the grading process is fair for everyone. ff

Resources & Reminders

Use the CAS website for:

- CAS *Syllabus of Basic Education* and updates
- "Verify Candidate Exam Status" to confirm that joint exams and VEE credits are properly recorded
- "Looking at the Exam Process" series
- Feedback button to the Candidate Liaison Committee
- Feedback button to the Examination Committee
- CAS Regional Affiliates news

EXAM REGISTRATION CONFIRMATION—If you have not received a confirmation of your registration for Exams 3L, and 5-9 two weeks prior to the registration deadline, please contact the CAS Office.

REMEMBER YOUR CANDIDATE NUMBER—It is the candidate number of a passing candidate that is first posted online when exam results are available, so keep a record of your candidate number! (Also, see "Remember—and Protect—Your Candidate Number," on the left in this issue.)

Candidate Liaison Committee Mission

The Candidate Liaison Committee communicates with CAS candidates, collectively and individually, who are taking CAS examinations. The committee informs candidates as to appropriate courses of action available to them. Through periodic communication, this committee informs candidates of results of examination administrations, actions taken on complaints received regarding examination questions, and reasons for syllabus and examination changes being implemented. Communication encompasses existing policies and procedures as well as changes being considered. The committee should advise the CAS and its committees of the interests of the candidates regarding matters that come before the CAS and its committees. Candidates may contact the Candidate Liaison Committee at the CAS Office address. The Casualty Actuarial Society is not responsible for statements or opinions expressed in the articles, discussions, or letters printed in *Future Fellows*.

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Vendor Links

The CAS provides vendor information on review seminars and study aids as a service to its candidates. The CAS takes no responsibility for the accuracy or quality of the seminars and study aids announced in *Future Fellows*. Please note that candidates are expected to read the material cited in the *Syllabus* and to use other material as a complement to the primary sources rather than a substitution for them. ff

ACTEX Publications/Mad River Books http://www.actexmadriver.com/ Exams 1, 2, 3F, 3L, 4, 5, 6, 7, 8, and 9	Jim Daniel's Actuarial Seminars http://www.actuarialseminars.com/ Exams 3L and 4
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