Episode 132: Gale Sinatra

# KL: Katie Linder

# GS: Gale Sinatra

# KL: You’re listening to “Research in Action”: episode one hundred and thirty-two.

# [intro music]

# Segment 1:

# KL: Welcome to “Research in Action,” a weekly podcast about topics and issues related to research in higher education featuring experts across a range of disciplines. I’m your host, Dr. Katie Linder, research director at Oregon State University Ecampus, a national leader in online education. Along with every episode, we post show notes with links to resources mentioned in the episode, a full transcript, and an instructor guide for incorporating the episode into your courses. Visit our website at ecampus.oregonstate.edu/podcast to find all of these resources.

On today’s episode, I am joined by Dr. Gale M. Sinatra, the chair and professor of psychology and education of the Rossier School of education at the University of Southern California. She is the past editor of the APA division 15 journal: Educational Psychologist, and she is currently the President elect of division 15. She is a fellow of APA, AERA, and The Society for Text and Discourse. She heads the motivated challenge research lab. The mission of which is to understand the cognitive, motivational, and emotional processes that lead to attitude change, conceptual change, and successful stem Learning.

Thanks so much for joining me on the show today Gale!

**GS:** Thank you so much for having me!

**KL:** So I’m really interested in the work that you’ve done in conceptual change learning and I’m wondering if we can first start out with a little bit of a definition, so what is conceptual change learning?

**GS:** Well that’s a really good question, so conceptual change learning is a type of learning where you already know something about the topic and yet it’s not consistent with perhaps a scientific understanding. So it’s a different case than when you’re learning something brand new. A good example with children is children often think that the earth is flat, and they are surprised to learn that the earth is spherical, round, like a beach ball and often that’s a very difficult concept for them to learn, and when we teach concepts to children or adults, who have non-scientific understandings it requires a different approach to instruction than if I teach you something brand new, that you’ve never heard before, like the scientific name for a particular plant. You didn’t know that before, you don’t have any pre-conceived ideas of what the name should be, so if I tell you the name you’re not really surprised or you’re not going to struggle to learn that. But when you have prior ideas that are inconsistent with the scientific ideas it takes what we call “conceptual change learning” to adopt this new conception.

**KL:** Okay, so I’m curious if this is just related to science, because I can think of an example, when I was growing up I would read the word “hors d'oeuvres” which you can imagine doesn’t look like how it sounds, and for a long time I didn’t know that’s what that word was and I didn’t know how it was pronounced, because I had heard hors d'oeuvres and I had read it and it looks very different. So it was very difficult for me when I saw that word in print to hear in mind the word “hors d'oeuvres” because it doesn’t look how it sounds. So is this something where it’s just pre-conceived information about science or about a particular process or could it be something like that, where you’ve experienced it one way without realizing there was other information that you needed?

**GS:** Well right, conceptual change learning does occur across a variety of domains and I mentioned science because that is where most of my work, and most of the work in the field of conceptual change is focused, but it’s been explored in other domains as well. It’s been explored in history for example. It’s been explored in mathematics, it’s been explored recently by my research team and colleagues. We’ve been looking at changing the public’s misperceptions about certain educational policies. Misconceptions about an educational policy, they may be against the policy but mostly because they don’t understand the policy. So it turns out that conceptual change learning can be pertinent to a variety of different domains.

**KL:**  So one of the things that I know you’ve done, is develop a model for conceptual change learning, and I’m wondering if you can describe the process for developing a model like this because I would imagine some people wouldn’t even know where to start. Is this something that kind of iteratively came about or did you go into the work thinking “I want to develop a model”?

**GS:** That’s a great question. We didn’t really mean to develop a model, we had written a literature review about certain motivational aspects of conceptual change for the academic journal *Educational Psychologist* and the editor at the time pushed us in the reviews in dealing with the reviews of this manuscript to develop a model. And what we did is we looked at current models of conceptual change at the time and we also looked at social psychological models of persuasion and attitude change, because it was suggested to us that was relevant and we put all of that together with our own ideas and came up with our own model and our goal was really to incorporate more motivational aspects of conceptual change learning. This was 20 years ago now, and so at the time motivation research and education was still really in its infancy and most researchers in science and learning thought that if you just tell students that they misunderstand the scientific concept and give them the correct information they will just accept the new correct scientific information, but it turns out of course that’s not what students do. They often hold their original conception dear and they often resist changing their conception and sometimes that’s because that original conception, like I mentioned the earth being flat, is very compelling to them and gives them some explanation of things, and to envision the alternative is very hard. Obviously no one has really seen the spherical earth unless you were in outer space. You can see the curvature of the earth if you are very high up in an airplane. It’s difficult to see the sphere so people have a hard time envisioning the correct scientific information and so that’s why the motivational aspects are so important and that’s why we incorporate those into our model.

**KL:**  So I’m really curious if you can talk about the relationship between like neural pathways of information, which might be kind of the brains, muscle memory, and I think the hors d'oeuvres example is a good one, like my brain is kind of triggered to think that word is something different than it is because I’ve always thought it was something different. Versus like more of what you are talking about here which is more of a belief system or something that is not necessarily a neural pathway, I just believe it to be true. Is it one or the other in terms of the ratio of how students are taking in this information? How are these things related?

**GS:** Well I can’t speak directly to the neural pathways part of your question because I don’t do neuroscience research directly, but you are right that information that we are familiar with and comfortable with is overlearned in other words it’s pretty engrained and we’re pretty comfortable with it, if people were to all of the sudden change green to mean stop, and red to mean go, that would create havoc as you can imagine on the roadways because people are pretty well versed with red being stop and green being go. So yes, overlearning a particular concept definitely makes that concept resistant to change. And then the other part of your question is the idea of are some of these ideas that people have beliefs and it’s a complicated, even philosophical question to say, “What do we know?” versus “What do we believe?” And there are all different kinds of ways that scientists and education researchers and philosophers answer those questions but certainly we talk about knowledge in our research group as what philosophers would call justified true beliefs. I believe the earth to be round but I think it’s a justified belief because I have looked at different evidences that support that piece of knowledge. So I would call the earth being round knowledge based on its justification from different evidences we’ve seen, for example, space mentions where people have viewed the spherical earth, that’s one piece but of course there’s many pieces of evidence for the earth being round.

**KL:** Okay, so earlier you had talked a little bit about science education and how that’s really been where your work has been focused. Can you talk a little bit more about the relationship between conceptual change learning and how it intersects with science education and maybe in terms of some of the research that you’re doing in particular?

**GS:** Absolutely! So as I mentioned in science there’s so many everyday conceptions that we have in physics, in astronomy as we were just mentioning, and in biology, and in many different disciplines there’s so many conceptions we have just from interacting with the world on a day to day basis that actually aren’t consistent with what we know to be true about the world from scientific research so we bump up against these misconceptions all the time and in science and that’s why the work on conceptual changes focus so much in the science domains is because it is so relevant for learning physics, for learning biology, and we’ve explored all sorts of topics to promote conceptual change in our own research. We’ve looked at misconceptions about climate change, misconceptions about evolution, misconceptions about genetically modified foods, and one of the ways that we confront these misconceptions, we have all sorts of different methods we use, but one way is something called reputational facts or reputational instruction where you say you may think that the foods that are genetically modified are cloned but actually that’s not true. They actually aren’t cloned and then you go on to present them information about the scientific explanations of genetic modifications for foods that we end up consuming and that method of stating: you may think this is true, and then stating the reputation of it, but it actually isn’t the truth. And then giving an explanation of what is scientifically accurate is a pretty effective technique to confront misconceptions and we have done that quite a bit. The other area of our research is then to look at what kinds of motivational or emotional factors weigh in to how likely you are to change your mind about a particular concept. So an example would be in evolution there are some people who are comfortable with the notion of animals changing over time, but are very uncomfortable with the notion that humans are related to the animal world and that humans have also changed over time, and the discomfort with that might come from a variety of places but it could be an identity issue where students start to wonder what does that mean about me and who I am? And are humans special? And those kinds of concerns and questions are very valid questions for students and they may create points of resistance to learning that biologists believe that all life on earth is related.

**KL:** So I’m wondering Gale, if you’ve had any finding on conceptual change learning that maybe surprised you or you found to be particularly interesting in the work that you’ve done?

**GS:** Originally the work that I began doing in the area of evolution and understanding, it surprised me the degree of emotionality involved in learning some science topics and that emotionality carries through today, like if you look at anti-vaccination movement, some of the anti-vaccination movement is based on misconceptions that vaccinations are linked to autism, which they are not, but it’s understandable that parents get very emotional and very concerned about are they putting their children at risk to vaccinate them? And so you can understand how these emotions that people have impact their understanding of the science, but when I first started out I was surprised at the degree of the emotionality related to the learning of science. It’s much more emotional than perhaps people realized, I think originally people thought: oh science it’s just a bunch of facts and it’s dry and people can learn it just like any other topic, and of course that’s just not true.

**KL:** So you’ve mentioned a lot of different examples here of working with children and educating children in the sciences, I’m curious if you know of any literature that looks at this conceptual change learning in adults, because I would imagine that the older you get the more rooted you get in what you originally thought.

**GS:** Actually we mostly look at adults, we mostly look at people over the age of eighteen, so we look at college students and members of the general public even more than we look at young children. And yes it’s true that adults are difficult to shift in their conceptions in part of what we discussed earlier about that ingrained learning, so the longer that you’ve been driving the more ingrained it is that you need to stop at a stop sign, like we were saying earlier, so yes older adults perhaps have more resistance to change and also they have more knowledge and so having more knowledge means that you’re understandings are connected to even more ideas and even more interconnected to what you know and what you think and so dislodging that becomes more even more complicated.

**KL:** Well, clearly there is a lot of depth to this topic, thank you, Gale, for giving us a little bit of insight into your work on conceptual change learning, we’re going to take a brief break, when we come back we’ll hear a little bit more from Gale about her experience with journal editing. Back in a moment.

In addition to producing the research in action podcast as the research director at Oregon State University E-Campus, I’m fortunate to work on developing original teaching and learning research projects. A recent one I am excited to share with you is our online learning and efficacy database which allows users to explore whether the learning outcomes of online and hybrid education environments are equivalent to face to face environments. This tool supports faculty in comparing course modalities and making the assessments of the outcomes of the studies. Learn more about the database at: ecampus.oregonstate.edu/research-database.

# Segment 2:

**KL:** Gale, one of the past experiences you’ve had is editing *Educational Psychologist*, which is APA division 15 journal. I would love to hear about how you came to edit this particular publication.

 **GS:** Yes, I really enjoyed editing that, I’m also currently editing another APA journal, I’m the associate editor for *Psychological Bulletin* right now. But yes, I spent six years editing *Educational Psychologist*, which is a journal that publishes reviews, essays, and models, and position papers for division 15 of APA, which is the psychology division, and I came to edit that because I had published my model in the journal and I had become very interested in the review process and we had just discussed how the editor had been influential in our decision to revise the manuscript and present the model, and that made me very intrigued about the role that the editor can play in shaping scholar’s contributions to the journal and I really was intrigued by that and wanted to try my hand at that and so when the editorship came up I applied for it and got it and it was a really wonderful experience and it’s one of the highlights I think of my whole career that I had the opportunity to do that.

**KL:** So I would love to hear a little bit more about some of the components of the role of a journal editor for people that are listening who may not really know, like what goes in to this, what are some of the things that you were kind of working on in that role?

**GS:** Sure, so you have both what’s called unsolicited manuscripts, so people just send you something and people ask if you could review it to have it potentially appear in the journal and you have what’s called solicited manuscripts, so an important job as an editor is to reach out to scholars and say “I know you’re doing work on this and it fits my journal, please send me something.” So manuscripts come in, either solicited or unsolicited, and then they go out for review, blind peer review, which means you take their name off of it and send it to usually three scholars with relevant expertise to provide a blind feedback, in other words it’s blind both ways so the reviewers don’t know the authors and the authors don’t know the reviewers and they give feedback and suggestions to the manuscript author and the editor’s job is to synthesize all of that and say to the author well because sometimes you might get conflicting information, this reviewer wants you to go this direct and this reviewer wants you to go in this complete opposite direction and so as the editor you have to make sense of all of that for the author and guide them on how to revise the manuscript and, if they do so successfully, it will be published and, if they don’t successfully do that, then it will not.

**KL:** So I would imagine that shepherding manuscripts through this process is like a huge piece of the role are there other things that go into the role as well, in terms of maybe liaising with the publisher or helping to promote the journal in other ways.

**GS:** Yes, but that’s usually done by the publisher and you pretty much stay out of that. You really work as the editor with the authors and the reviewers, particularly to recruit good reviewers and appropriate reviewers with the right expertise and to work with the authors to develop their ideas and to respond appropriately to the reviewers concerns, and so the majority of your time is really working with the authors and the reviewers.

**KL:** Alright so I’m curious what is the most challenging thing, in your opinion, about being a journal editor?

**GS:** Well universally every journal editor will tell you the most challenging thing is to find the appropriate reviewers who are available and willing to review the manuscripts. The way that the system works, that is up for question and debate in academe right now, and that is academics volunteer their time for free to read these articles and give feedback on them and it takes a tremendous amount of time in my own career to do maybe 30 or 40 or 50 of these in a year. And each one of them takes several hours to review and sometimes people will not only read the article itself but when the author mentions some other research the reviewer might go read that just to be fully informed so it could take days even just to complete a single review. So the challenging thing for editors is just to get qualified reviewers to take the time and give you a good quality review.

**KL:** So as you started out in this process of being a journal editor how did you learn the ropes? Was there someone there to kind of mentor you or how were you picking up on this information?

**GS:** So part of it is coming from having been an author and written a lot of pieces myself and gone through the review processes where you have good experiences and not so good experiences with reviewers and with editors. So you learn a little bit by doing just in your own experiences to what was helpful that an editor told you, what was not good feedback that a reviewer gave that set you back, and you kind of have those experiences that you bring to the job of editing. But certainly the prior editor or editors, you can reach out to them and ask their advice, and you also have other colleagues who edit their journals and the process is pretty much the same across many journals so they appreciate and have the same sorts of challenges you do and often can give you advice.

**KL:** So you had mentioned earlier that this has been just a huge pleasure for you to work in this capacity, can you talk a little bit about some of the things you enjoyed the most about being an editor for this journal?

**GS:** Well absolutely the best thing about being the editor for *Educational Phycologist* is that I was able to help junior scholars, in particular, bring their work to fruition and get it published. I really enjoyed that part, helping people develop their manuscripts and their ideas working with them to get them out, that’s very gratifying and I say for junior scholars because of course senior scholars don’t need quite as much help so they really know how to do that so it’s really very rewarding to help junior scholars to advance their ideas and it’s an important journal in our field so to have to have junior scholars publish in it is something that’s really rewarding and that’s probably what I appreciated the most about the opportunity that I had.

**KL:** I’m curious if you could talk a little bit about you what you think the role of journal editors are, kind of more broadly in terms of shaping the literature. I mean many journals have an aim and scope of what they’re trying to do but what role did journal editors play in shaping that over time and keeping levels of quality or equity among who’s being published in the journal. Can you talk about that larger role?

**GS:** Yes they do play a huge role. I mentioned before that you can solicit manuscripts which means you write to people or you see their work presented at a national conference and you reach out to them and say this is work that would belong in this journal and you should send it to me. And so you can reach out and encourage people to submit who are doing work that’s not always featured in your journal and that’s how you can broaden the scope and obviously you can reach out to diverse scholars whose work might not have been featured before and get them to submit. And you can get new and different that you would like your journal to be exploring and you can reach out to them and so part of your job is to get new and different and exciting and cutting edge individuals’ work into the journal and you can make a big impact by doing that.

**KL:** So for people who are hearing this and they are intrigued and they want to hear a little bit more about journal editing or they’re maybe just interested in kind of finding a way to break into this, do you have any suggestions for people that might want to get started?

**GS:** Oh absolutely, I think as a junior scholar you should probably wait until you have tenure because it takes a lot of time and then as you explore the different journals you should think about which ones fit you in terms of what you, what skill set you have. I particularly was interested in *Educational Psychologist* because it was an excellent fit for me, I liked to write theoretical pieces and it’s a theoretical journal and of course it as in my main discipline so it was a great fit for me and I chose it for that reason. So you need to choose one that you are interested in editing that is in your wheel house that you think you can make a contribution to. And then you need to get practice editing. So you can do that by trying to guest edit a special issue which is a common phenomenon that a lot of journals do which gives you some experiences. I’m mentoring a junior faculty member right now on co-guest editing a special issue of the *International Journal of STEM Education* and she’s learning the ropes and hopefully she’ll get some good experiences editing and I think that’s a key thing that you need to do and then pursue the opportunity when it comes up.

**KL:** What are some of the things you’ve learned Gale, over your years of being a journal editor? Maybe things you weren’t expecting or just things that were new for you.

**GS:** I think that it’s much harder for people to write theoretical pieces than it is for them to write empirical pieces and empirical pieces are their research written up and I think those are easier for people because they know the research, they know what they did and they’re able to describe that but some of these theoretical pieces I think requires a different way of thinking kind of that stepping back and I think taking time to do that is a difficult thing to do and that’s what’s required for those pieces. So that surprised me when I started because I always think that those are easier to write for me but I think they’re not for most people.

**KL:** Okay so I know we have a lot of people listening who are trying to publish in academic journals. What advice do you have from an editor’s perspective of what researchers can do to better place themselves and to kind of get through this gauntlet of publishing in an academic journal?

**GS:** Sure, the very first thing that you need to do is pick the right journal for your work. Most people’s work gets rejected because it’s really not in the right place. People need to read the journal’s mission statement and then read some articles in the journal and see, “oh yeah, this journal does publish the kind of thing I’m trying to publish” and so that’s the target journal. And then write the manuscript towards publication in that journal. In other words using their style and their expectations and requirements for authors which they publish, you should write with the intent of being published in that journal so follow their guidelines and follow their recommendations and follow their style and that will take you a long way towards getting published in that journal. And then the next most important thing I think you can do is get your article pre-reviewed. In other words have colleagues, senior faculty, read it and give you feedback before you submit it. It’s kind of like getting a free round of reviews. Make those changes and improve the manuscript before you submit it and it’ll probably have a better chance of getting published if you do that.

**KL:** Well this is really good advice, Gale. I want to thank you for coming on the show, sharing more about conceptual change learning, and also about your experience as journal editor. It’s been really fun to learn from your experiences.

**GS:** Well thank you very much. It’s been a pleasure.

**KL:** Thanks also to our listeners for joining us for this week’s episode of Research in Action. I’m Katie Linder and we’ll be back next week with a new episode.

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# Bonus Clip:

**KL:** In this bonus clip for episode 132 of the “Research in Action” podcast, Dr. Gale Sinatra discusses her next book project. Take a listen:

Gale, I’m really curious what is next for you, what’s in your publication pipeline coming up?

**GS:** Well the project that I’m the most excited about right now is I’m co-authoring a book with my friend and colleague, Dr. Barbara Hofer from Middlebury College in Vermont, on the psychological factors underlying the public understanding of science. So as we had talked about in our fuller conversation, interested in issues like motivation and emotion, and how motivation and emotion intersect with our learning about science, and so Barbara and I are working together to put out this book that looks at all these kinds of issues with how it is we struggle to understand scientific issues today. And what does that mean for the public and how can we do a better job as educators and communicators, science writers, to help the public understand these complex scientific topics that affect all of our daily lives.

**KL:** So this sounds really fascinating, I’m curious if you have decided to publish this with an academic press or more of a trade press.

**GS:** Well, we’re going to go right down the middle there and we’re publishing with Oxford University Press in their academic trade division, which is something right in-between academic and trades, so that means that we are trying very hard to write this in a way that would be acceptable to non-academics and we certainly hope non-academics, who are interested in why we have all of these challenges with understanding and learning science, and what that means for policy in our country, then I hope they will be able to appreciate and make use of the volume.

**KL:** Alright, so when can we expect to see this book coming out Gale?

**GS:** Well, I’m hoping in about 18 months, we are working on writing it now, and of course there will be some editing and then production so we’re hoping in about 18 months.

**KL:** Alright, so it sounds like maybe early 2020?

**GS:** Yes.

**KL:** Around that time, okay well we will definitely loop back and update the show notes for whenever the book is out so that people can take a look, but it is always fun hearing about your most recent projects, thanks for sharing.

**GS:** Thank you very much!

**KL:** You’ve just heard a bonus clip from episode 132 of the “Research in Action” podcast with Dr. Gale Sinatra discussing her next book project. Thanks for listening!