



# UNDERSTANDING NEGATIVE SYMPTOMS IN SCHIZOPHRENIA: A HOLISTIC APPROACH



## Interview with Professor Ann Kring

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*Dr. Ann Kring is a Professor of Psychology at the University of California, Berkeley. Professor Kring's research group focuses on understanding emotional and cognitive processes in psychopathology. In this interview, we discuss Professor Kring's study of negative symptoms and social decision-making in individuals with schizophrenia.*

**BSJ:** How did you get involved in the field of psychology and the study of emotional processing in schizophrenia?

**AK:** I first got involved in psychology when I was in high school—I took an introductory psychology class and found it fascinating. So I decided that I wanted to major in psychology before I even went to college. Once I got to college, I got involved in research on visual perception, and I was learning how to program computers. I wanted to continue either that or neuropsychology research in graduate school, as I became interested in brain-behavior relationships. After applying to graduate schools, I went to the State University of New York at Stony Brook to study neuropsychology. When I got there, it turned out there wasn't any neuropsychology research going on. So I was scrambling around, trying to figure out what I was going to do as a graduate student. There was a faculty member who was doing research in schizophrenia, and I figured I would



Professor Ann Kring

be able to apply neuropsychology to that. I started learning about schizophrenia and quickly became fascinated by it. All of the myths I had about it were quickly disproven. It was also during that time that I started to read about emotion. I combined schizophrenia and emotion in my dissertation study, and I've been doing the same thing ever since. It wasn't what I entered graduate school for, or what I thought I would end up doing. But once I got to graduate school and started learning about something that I didn't know anything about, it fascinated me and really launched my entire career to read about emotion. I combined schizophrenia and emotion in my dissertation

study.

**BSJ:** What are negative symptoms, and what specific negative symptoms are found in people with schizophrenia?

**AK:** Within schizophrenia there are positive and negative symptoms. Positive symptoms refer to having an excess of things that people do not ordinarily have, like hearing voices or having delusions. Negative symptoms refer to not having things that people typically do. There are five different negative symptoms. *Flat affect* is a symptom where people do not have outward expressions of emotions. Individuals may not change their face at all, not laugh, not frown, speak in a very monotone voice, or avoid any eye contact. It creates tremendous social consequences for someone who has that symptom. Another symptom is *anhedonia*, which means “without pleasure.” People with this symptom do not experience enjoyment in things from daily life. *Avolition* is a symptom where people have a hard time motivating themselves to do things. *Asociality* is a symptom of lacking social interactions. Here, people prefer to be alone, and they find being around other people confusing and anxiety-provoking. The last negative symptom is called *alogia*, “without speech.” It’s not that people with schizophrenia are mute, but it means that they do not say very much and will not elaborate on their thoughts. The ones that I focus on the most within my research are the lack of outward expression and anhedonia. We are just now beginning to study asociality and avolition; we are slowly making our way through the negative symptoms.

**BSJ:** What is the Clinical Assessment Interview for Negative Symptoms (CAINS), and how do you implement it in your studies?

**AK:** The CAINS is a clinical interview designed to assess the five negative symptoms. Part of the problem with older clinical interviews was that they did not cover the entire domain of negative symptoms. They had not kept up with any recent research in the field, particularly for anhedonia, so we added that topic to the CAINS. Clinical interviews are used a lot in research in schizophrenia to get an assessment of how severe someone’s symptoms are. They can also be used in a clinical setting. If someone has a relative with schizophrenia and they take them to see a psychologist or psychiatrist, they can use these interviews to get a sense of the kinds of symptoms they’re experiencing and try to target the treatment toward the most problematic areas for that person. So the goal of

the CAINS is to come up with a better and more comprehensive way to assess all five negative symptoms.

**BSJ:** Are there any limitations that remain in the CAINS?

**AK:** Some people wish it didn’t take as long to administer. The entire test can take 20 to 30 minutes to get through all the questions. People always want to be quick: “How stressful is your life? Tell me on a scale of one to 100. Ok, we’re done.” Boom. Spending 20 minutes going through all the questions is a downside in some people’s eyes. However, we think the tradeoff is worth it because we’re really interested in what a person with schizophrenia tells us. A lot of the time, clinical interviews tend to prioritize a mental health professional’s impression over what a person with schizophrenia says. A psychiatrist might talk to somebody for five minutes and make a judgment based on that conversation. In developing the CAINS, we didn’t think that’s a very good approach for a couple of reasons. First, it diminishes the experience of the person with the illness. You have to listen to somebody to really understand what they’re experiencing. We also think that listening to that experience is what’s going to tell us about the symptom, not a mental health professional’s quick assessment. The reason the CAINS takes longer is because we ask a lot of questions, and we’re trying to get the person with schizophrenia to tell us a lot of information about their own experience.

**BSJ:** In one study,<sup>1</sup> you investigated anticipatory pleasure deficits in people with schizophrenia. What is anticipatory pleasure and how is it characterized in people with schizophrenia?

**AK:** The symptom of anhedonia prevents people with schizophrenia from experiencing pleasure. In our studies, we show people with schizophrenia a funny film clip or give them a piece of chocolate, and they tell us that they enjoy it just as much as any other person. They don’t seem to exhibit anhedonia. That made us wonder if anhedonia is more complicated than we think. Our emotional experiences really unfold across time. There are two pieces to anticipatory pleasure: predicting how good you’ll feel about something in the future, and how good you feel in the moment based on knowing something positive is going to happen. Anticipatory pleasure, then, is what motivates us to do lots of things. What we’ve learned in our studies is that people with schizophrenia don’t have problems in experiencing in-the-moment pleasure at all, but rather have trouble with anticipatory

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pleasure, and that might be where the anhedonia lies.

**BSJ:** Projections, which are mental representations of the future, are an important component of anticipatory pleasure. You hypothesized that memory tasks would enrich the projections of people with schizophrenia. How did your results compare to this hypothesis?

**AK:** Other studies found that people with schizophrenia enjoy chocolate just as much as anybody, but they don’t maintain or savor that response. We hypothesized that people with schizophrenia might have trouble remembering positive events, and that may be why they don’t look forward to things. A lot of the time, we use the past to think about the future; we envision it and then try to make predictions about whether or not we’re going to enjoy it. We conducted a study in which we interviewed people about memories of the past, and people with schizophrenia didn’t seem to differ from people without schizophrenia in the way they were able to remember things that they enjoyed. However, they still had some trouble prospecting, or looking forward. Our hypothesis that memory would be the key to understanding why people with schizophrenia have trouble anticipating that things will be enjoyable wasn’t fully supported. People with schizophrenia can remember positive things, they just don’t necessarily translate that memory into making predictions that things in the future will be enjoyable.

**BSJ:** How could memory tasks help people with schizophrenia experience greater anticipatory pleasure?

**AK:** That is a great question! We’re working on building an intervention for people with schizophrenia to help boost their anticipatory pleasure. Part of what we’re doing is trying to boost memory, even though it seems like it’s okay in people with schizophrenia. Without prompting them to think about a memory, they wouldn’t necessarily do it. Most of us automatically think about our past, even if someone doesn’t tell us to. We think about our stored knowledge—it happens almost automatically. But in people with schizophrenia, it doesn’t happen automatically. We found that if we prompt people to explicitly access their memory, that may actually help them uncover stored knowledge or past experiences, and by doing that we may help people think about the future and take pleasure out of it.

**BSJ:** In another study,<sup>2</sup> you investigated social outcomes and subsequent decision-making in people with schizophrenia. Why did you choose to study social decision-making?

**AK:** Since one of the negative symptoms of schizophrenia is asociality, we were interested in trying to understand emotion in a social context. We knew that social interactions are difficult for people with schizophrenia, so we tried to understand what it was about social interactions that they don’t enjoy. Past studies suggested that although people with schizophrenia said that they prefer to be alone, they would report that they were lonely. That’s a big conundrum. So we turned to social interactions to unpack a little about what it is that’s hard about them. You make a myriad of decisions that you don’t even think about in the context of a social interaction. One such decision we focused on was whether or not to trust a person you’re meeting for the first time based on their facial expressions. There’s a lot of literature outside of schizophrenia that shows that we naturally trust someone who is smiling a lot better than someone who is scowling. So we tested to see if people with schizophrenia would benefit from this display.

**BSJ:** Can you explain the trust game that was implemented in this study?

**AK:** The trust game was a computer simulation in which participants iteratively interacted with the same person. We had four different characters, and one of them was Bill. You see Bill, and then you have to decide if you want to invest in him. You give him some amount of points—it’s a proxy for money.

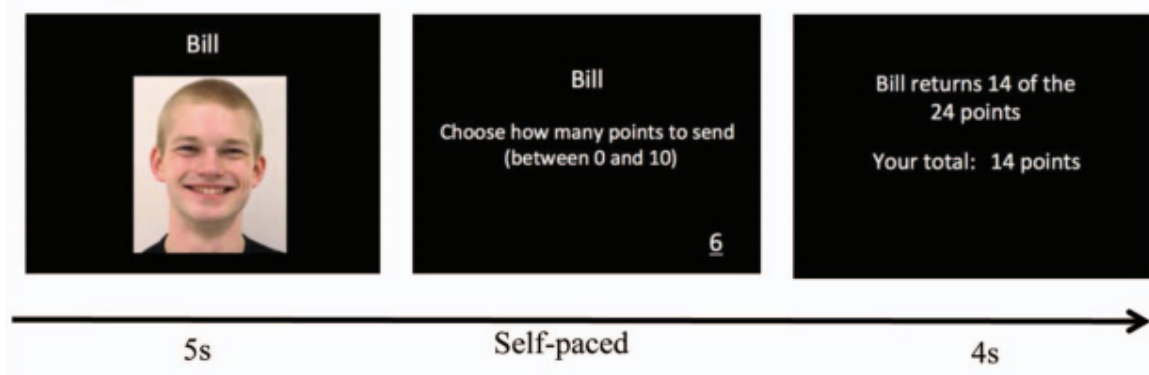


Figure 1: Example of a trust game trial. Participants saw a dynamic clip of a social partner and decided how many points to send to the partner, representing the amount of trust placed in them. Then participants saw the outcome of the interaction by the amount of points returned by the social partner.<sup>2</sup>

Then Bill will either reward your trust and give you back money, or he will screw you over and take your money away. This kind of game had been done before, and usually people are pretty good at quickly learning who they can and can't trust based on their gains and losses. We did this experiment with two things happening at once: there were the points exchanged, and Bill was either smiling, scowling, or had a neutral display. We found that people with schizophrenia were better than people without schizophrenia at learning when not to trust. That was true whether Bill was scowling or smiling. This could be a reflection of life experiences where people with schizophrenia have trusted others and it wasn't rewarded, or just a slower reaction to benefit from that positive signal. All of that told us something about what interactions may be like for people with schizophrenia. They may be wary to trust, even if it's a friendly person who's smiling and exhibiting trustworthy behavior. That tells us that we need to work with them to help them recognize that they're not ultimately going to get burned by allowing themselves to trust other people.

**BSJ:** What implications do the results of your research have for developing treatments for people with schizophrenia?

**AK:** We hope to use the research to develop treatments for a couple of reasons. First, the current frontline form of treatment for people with schizophrenia, medication, doesn't make much of a dent in negative symptoms. Medications can help people stop hearing voices, minimize delusional beliefs, or clear up disorganized thinking, but they don't really help with the lack of outward expression,

the anhedonia, or the lack of motivation. Doing this research, we hope we've drilled in on not just broad negative symptoms, but particular problems like anticipatory pleasure and giving trust in social situations. We could then build psychosocial treatments that work on those particular things.

**BSJ:** What are some treatments that you have developed for negative symptoms?

**AK:** One was a skills-based treatment – each week we would teach a new skill. One skill was called “daily positives”. We asked people to pay attention to three positive things that happened in their day. It could be small things like getting a piece of chocolate when they weren't expecting it, or noticing a hummingbird while walking. The idea is to focus people's attention on positive things and link that up with their feelings. Another skill was called “reappraisal,” which is learning to think about a situation differently to change the way you feel about it. The goals in teaching these skills were to help with anticipatory pleasure as well as some social aspects of schizophrenia. An important lesson that we learned from this treatment was that over time, people forgot to use the skills. We can't go in and do an intervention and think we've solved the problem. For people with schizophrenia, it's going to require longer than six weeks. So we're working now to develop a treatment that lasts 15 or 16 weeks. After the treatment is over, we're going to do a booster session to remind people of the skills. More importantly, we're building mobile apps so we can incorporate the treatment into the course of daily life. One of my former students developed a mobile app to help people with motivation. It's a

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social media platform for people with schizophrenia to post their goals and accomplishments. Other people can respond with balloons, a thumbs-up, or other kinds of rewards. We're trying to harness the power of 21<sup>st</sup>-century technology to help people in their daily lives. In-person treatments are expensive, in terms of not just finances, but also time. If we could build treatments that we can start here and continue delivering them once the patient leaves, that will help with the effectiveness of the treatments.

**BSJ:** What is some advice you would give to students who are interested in getting involved in research?

**AK:** I would say do it, because we need more science. For some reason, we're living in a society where people are starting to be skeptical of science, which I think is dangerous. I would say if somebody wants to get into the sciences, they absolutely should. It's a fascinating career, no matter what your field is. Whether you're in nanotechnology or psychology or anthropology or engineering, it's fascinating. If you like mysteries or puzzles, this is the career for you. You go in, and you've got an interesting hunch. So you turn a question into a hypothesis, and then you test it. It can be super rewarding. You can get to the bottom of the puzzle, and it's also fun because getting the answer helps you think of more questions. You have this never-ending curiosity because science raises as many questions as it answers.

**BSJ:** Thank you very much for your time!

### REFERENCES:

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