How the brain handles a loved one's death: A Q&A with Mary-Frances O'Connor

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Coping with grief and loss is accompanied by a wave of emotions. Besides the psychological aspect, there are also several physiological changes the body undergoes as the brain adapts to a changing reality after the death of a loved one.

Mary-Frances O'Connor – associate professor in the Department of Psychology and a leader in the field of studying the psychological and physiological impacts of grief – has been working on understanding the neurobiological and cardiovascular factors involved in processing prolonged grief[1], which is a recognized clinical condition. It involves persistent grief that is intense enough to cause problems in people's daily lives.

O'Connor directs the Grief, Loss, and Social Stress Lab[2], which investigates the effects of grief on the brain and body as a whole. In her most recent study[3], O'Connor's team studied the impact of grief on heart function. Their findings suggest that severe grief can escalate blood pressure.

O'Connor also is the author of "The Grieving Brain: The Surprising Science of How We Learn from Love and Loss," which was an NPR SciFri Book Club Pick and was named to the Behavioral Scientist Notable Books of 2022 list.

In this Q&A, O'Connor discusses her research and the gaps she thinks need to be filled in understanding how the brain handles grief.

What made you dedicate your research to grief?

I have both a scientific curiosity about bonding and grieving, and personal experience. I think from both, it means that I feel very comfortable talking with people who are grieving. It offers an opportunity to connect at a very deep level with people who are feeling very vulnerable and are in a great process of transition. I am making grief, and therefore death, part of my everyday awareness. It has made me a more joyful person. It is both the compassion that I feel for others and the way death gives meaning to life that have made this a fruitful area of study for me.

How do you study the neurobiology of humans when it comes to how we grieve?

I have used functional neuroimaging to study grief in human beings. When participants agree to be in studies, they come into my lab. I do a clinical interview with them about their experience of loss. They also bring a photograph of the person who has died, and I'm able to scan that photograph into a computer. I can show it to them on goggles while they're lying in the neuroimaging scanner. And this means I can compare the brain activity when they're looking at their deceased loved one, and when they are looking at a stranger. From this subtraction method, I can see the parts of the brain that are very specific to the grief one experiences when reminded of the loss of this person.

Although we can have grief from a lot of different events, I have focused on grief over the death of a loved one. I think that there may be some evolutionary reasons why the death of a loved one is particularly impactful. And that those evolutionary reasons may have left their fingerprints in our brain, how our brain processes a bonded relationship, and how we understand that the person we're bonded to has died.

Can understanding the scientific aspects involved in grief – such as what happens to the brain during grief – help one handle grief better?

I believe that, while knowing what we're going through won't take the experience away, it can make us feel much more normal. I wrote a book for the general public called "The Grieving Brain," because I believe that understanding there is a why and how can make the experience less frightening and help us to be patient with ourselves. Grieving takes a long time, and to understand that the brain is wrestling with new information is described as validating by many people who read the book. As a simple example, many people find that they continue to pick up the phone to try and call a loved one, and then realize that this person cannot be phoned anymore and feel that they're losing their mind. But there are reasons why this happens. Understanding the grief process makes us feel more normal.

Does sharing grief experiences with somebody else make any constructive changes to the brain?

We definitely know that, psychologically, sharing our grief is helpful in the right circumstances, and with the right person who understands what we're going through. When you lose your "one and only" you feel incredibly alone, and when you express that to someone else, they won't have had the same experience. They won't be missing your loved one in the way that you are. But we can suddenly connect with the fact that human beings experience grief, and it can make you recognize the humanity. The universal experience can make you feel less alone in that moment.

What gaps remain about how we process grief?


We recently attempted to do meta-analysis of neuroimaging studies of grief, a statistical analysis that combines results from multiple scientific studies. And there are not even 17 studies yet for neuroimaging, which would be the minimum required for a meta-analysis. So, we have a lot left to learn about the neurobiology of grief. But something specific I would point to is that the studies I just referred to are really studies of grief – that moment in the scanner, where the person is overcome with a wave of grief. But many of the research questions that we have are actually about grieving, or the way that grief changes over time, as we learn to live in this new reality without our loved one. This would require longitudinal MRI studies, or multiple scans of the same person over time to see what is changing. We have maybe one or two longitudinal imaging studies thus far. So, there are just so many questions that remain.

**How can grieving be a form of learning?**

You can't really talk about grief without talking about love. If we understand that, then it may be easier to understand that, when a loved one dies, the brain has to change its understanding of the world. It has to encode this new reality that we are walking around with.

We have to relearn an infinite number of habits – for example, that we don't have to buy soy milk because our lactose-intolerant daughter is no longer eating breakfast with us. But we have to learn much larger things as well. For example, if you were intending to retire with this person, now all of those plans have to change, discovering what is meaningful to you. Although we can learn to create a meaningful life again, that is a long learning curve.

**In your TEDxUArdison talk, you said the question that has plagued you is why grieving takes so long. Through your research, have you found an answer that satisfies you?**

I think part of the answer is learning takes a long time. In addition to that, it is my theory that our brain actually gets in the way of learning. And what I mean by that is, we can have multiple streams of information in our brain at the same time. You can have a memory that your loved one has died, perhaps you were there at the bedside. But you also have this attachment neurobiology, that comes with this belief, "I will always be there for you, and you will always be there for me." And that attachment neurobiology does not change overnight. So even though your memory says one thing, your attachment neurobiology says a different thing. And those cannot both be true. It makes the learning process harder; there's something interfering with updating your understanding of the world. When our loved ones are living, it's very important that we believe that they are out there for us. It is what keeps us attached. It's what keeps us returning home at the end of the day. But the solution that the brain has for our loved one being absent is simply to go and get them. It is very difficult for the brain to understand that they no longer exist.

O'Connor spoke about how our brains handle grief at the Jan. 31 TEDxUArdison event in a talk titled “How Do Our Brains Handle Grief?” Watch the video below.

Watch other talks from the event and read tips on public speaking from Diana Leonard, director of public speaking and senior lecturer in the Department of Communication, in previous stories spotlighting the inaugural TEDxUArdison:

- Check out videos of the TEDxUArdison talks and learn how to deal with public speaking nerves
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