

# Remembering Cora Sadosky

*Give me your tired, your poor,  
Your huddled masses yearning to breathe free...*<sup>1</sup>

Cora Sadosky fought many battles and in many fronts. She had tremendous convictions against many injustices, gender inequality, and discrimination in our society. She often took the flag of the underrepresented, underserved, and underestimated. She chose to fight many of her battles from within the mathematical community, sometimes even risking her own mathematical career. She showed a lot of courage in this sense and never worried about the consequences for her. She was never afraid to express her views.

We are deeply saddened for her passing but through her teachings we celebrate her life. To remember her we choose to focus on personal experiences that are not so well-known, particularly about her mentorship role and her unselfish devotion to help young mathematicians<sup>2</sup>.

Cora always wanted to help students who were interested in following a research career in mathematics. In particular she interacted with many students in Venezuela and in Argentina. In her years in Caracas, Cora was very influential on a group of Venezuelan mathematicians, María Dolores Morán, Ramón Bruzual, Marisela Domínguez and Stefania Marcantognini, among others, and a Uruguayan mathematician, Rodrigo Arocena, that got their PhD degrees at the Universidad Central de Venezuela (UCV). She also aided others pursue their doctorates in the US, including Gustavo Ponce who went to Courant Institute in 1978 and later Cristina Pereyra who went to Yale University in 1987. Likewise, during her sabbatical year in Buenos Aires in 1984-1985 she helped many Argentinian mathematicians come to the US for their doctoral degrees; among them, José Zero who went to University of Pennsylvania, Estela Gavosto and Rodolfo Torres who went to Washington University, and Andrea Nahmod and Lucas Monzón who went to Yale University.

Over the last thirty years Cora conducted her professional life in the US but she continued to be interested in mathematics in Argentina and Venezuela where she often visited Mischa Cotlar. She was always trying to help colleagues and students in those countries in any way she could.

Three years ago Cora retired from Howard University where she had been a professor since 1980. With her husband, Daniel Goldstein, they moved to California to be closer to their daughter Cora Sol, son in law Tom, and beloved granddaughter Sasha.

We remember here particular moments and aspects of her mentorship.

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<sup>1</sup>Form *The New Colossus* by Emma Lazarus; the poem engraved on the Statue of Liberty

<sup>2</sup>A biographical sketch of Cora Sadosky and some of the historical events surrounding her life in different countries can be found for example in <http://www.agnesscott.edu/lriddle/women/corasadosky.htm>

**Gustavo Ponce:** In 1976, the Universidad Central de Venezuela started a graduate program in mathematics. At that time I was Cora's TA in a course on Advanced Calculus. She convinced me to take two more advanced courses, one with Mischa Cotlar in Functional Analysis and a seminar on Harmonic Analysis where Cora and Mischa alternated as lecturers. These courses shaped my view of mathematics and the enthusiasm of both lecturers was as inspiring as the content. In retrospect, it is amazing that the topics were and still are so fruitful in problems related to my research interests, the field of nonlinear partial differential equations.

Cora suggested that I should pursue a career as a mathematician, and recommended me to apply to the Courant Institute. She even made a providential call to Louis Nirenberg asking for an answer to my application: it turned out that it had been lost. This was just one of the many favors for which I feel so much in debt to her. She has been a systematic source of inspiration and academic advice and a model of intellectual integrity since those years at UCV.

**Estela Gavosto and Rodolfo Torres:** We met Cora at an annual meeting of the Unión Matemática Argentina in the mid 80's and often visited her then in Buenos Aires (we were living and studying in Rosario, another city in Argentina). From the first time we met she showed a lot of interest in getting to know us, mathematically and otherwise, and listening to what we wanted to do in our lives, so she could help us maximize our options. She never pushed us in any direction, but she was the first to suggest us to study in the US. We still remember her words when we told her that it would be impossible to get fellowships for both of us at the same university. Her almost irritated response was one we will hear from her many times over the years and in many different circumstances: "... and who told you that? If you plan and do the things right you can do it." Her attitude remained the same over the years. She was always positive and enthusiastic. Nothing ever seemed impossible to her. With her help we went to do our PhD degrees at Washington University in St. Louis. She strongly encouraged us to go there and told us it would be a great place for us and a good match for many of our interests. She was right. Not only we found a great math graduate program but also a terrific atmosphere where we met fantastic teachers and other students who have become long lasting friends and mathematical colleagues. Several years later, we also thought it would be impossible to get postdoctoral positions at the same place or nearby ones, and then impossible to get tenure-track jobs at the same university. "And who told you that?", Cora repeated time and time again. She was there always ready to give advice and help us in what she could. She understood the "two-body problem" better than anybody, brought awareness about this common issue in our profession, and worked hard to help people in this situation. She was tireless in trying to achieve any goal she set her mind to and always infected us with her optimism. Cora was also concerned with many other aspects of the academic life and she often told us to learn about them and encouraged us to be proactive. She taught us that for any change to take place people really need to get involved. We will always be very thankful for all her help, mentorship and guiding example.

**Andrea Nahmod:** Cora Sadosky was my professor and undergraduate advisor in Buenos Aires. She was also a friend. In 1984-1985, during the last year of my Licenciatura en Matemáticas (a degree similar to a Master of Science) , several research mathematicians living abroad during the military regime returned to the Universidad de Buenos Aires for a year, to teach. Cora Sadosky was one of them. I knew of her before her arrival to Buenos Aires, where she spent her sabbatical year, through one of my uncles, Victor E. Nahmod. Victor, a biomedical researcher and physician, had been Daniel Goldstein, Cora’s husband, clinical teacher at the Instituto de Investigaciones Medicas at the Universidad de Buenos Aires. Victor and Daniel then became scientific collaborators for many years. Of course, Victor knew Cora’s parents and Mischa Cotlar. But I first met Cora at the campus of the Universidad de Buenos Aires at the beginning of Fall of 1984 and like many others rushed to enroll in her topics course on *Singular Integral Operators and the theory of  $A_p$  weights*. To say that this course opened up our heads would be an understatement. To this date, I marvel at the course notes and at how deep and useful was the mathematics she taught us back then. It was an easy decision to do my Licenciatura’s thesis under her supervision. I recall going one morning to her office to discuss it and spending practically the whole day with her at the blackboard passionately explaining me lots of “hard analysis”. It was exhilarating. For my thesis, we settled on *Factorization of operators and the Nikishin-Stein theory*. Garcia Cuerva and Rubio de Francia were at that time writing their celebrated book and Cora had drafts of some of its chapters. I recall leaving her office that day late in the afternoon with these, together with a pile of papers by Grothendieck, Maurey, Nikishin, Stein, Pisier and others. These were the first research papers I read and learned to do so with Cora.

When I decided later that year to pursue my PhD in the US, Cora did much more than write letters of recommendation on my behalf. She truly guided me and helped me each step of the way. Alberto Calderón was also in Argentina at that time after his (first) retirement from the University of Chicago. He had been my professor in Functional Analysis and thanks to Cora he was a member of my Licenciatura’s thesis committee and after my defense wrote a letter of recommendation on my behalf. I graduated in November of 1985 and by then Cora had returned back to the US. Since the earliest I could start graduate school in the US was September 1986, Cora worried about how to, mathematically, make the most out of the 10 months in between. She thought it was fundamental I continued learning mathematics until I started my PhD in the US. She suggested several topics and gave me her own copy of J.L. Journé’s book, while asking C. Segovia to read it with me and make sure I learned the material inside out in the months ahead. Cora went out of her way also at a personal level, reassuring my parents I was not going far away alone, for she and Daniel would take care of me. And so they did. My first 2 weeks in the US and ever away from home were at her home in Washington, DC. Cora later insisted I call her collect from New Haven often to her home in DC to tell her about my studies and life at Yale; to let her know I was alright. I visited Cora and stayed at her home many times afterwards, in Washington, DC and while she spent a year at MSRI in Berkeley during 1987-1988. She was always there for me as a mentor and as a

friend throughout my graduate school years in New Haven.

Cora had an impeccable work ethic and very high standards; she was all about being the best you can be, as a mathematician and as a person. She inspired all of us to work harder and be better, each day, every day. Many of us would probably not exist as professional mathematicians had not been for Cora. Our gratitude is infinite.

**Cristina Pereyra:** Corita, as we knew her, was a dear friend of my mother, Concepción Ballester, from the time before I was born; so were her parents Cora Ratto and Manuel. All of them, my mother included, were mathematicians who grew up in the golden era of mathematics in Argentina, the fifties and the sixties, a time when Laurent Schwartz, and Antoni Zygmund would visit Buenos Aires because the US and Europe were interested in identifying and helping talented budding mathematicians. In one of those visits Zygmund recruited Alberto Calderón and Mischa Cotlar to the University of Chicago. In turn, Calderón and Zygmund would become Corita's advisors at Chicago, where she received her PhD in 1965.

In 1964, my mother, my older brother and me joined my father in the US where he was getting his PhD. We never returned to Argentina, by 1967 many of my parents' former colleagues in Buenos Aires had been fired or resigned from the university for political reasons. Instead we landed in Caracas, where my parents became professors at the Universidad Central de Venezuela. Things in Argentina only got worst, and in 1974, when Corita, her husband Daniel, young daughter Cora Sol and her parents came as political refugees to Venezuela, we all lived in the same building (San Bartolomé, in Caracas every building has a name instead of a number). We were in the 12th floor of one tower, Cora Ratto and Manuel on the first floor of the same tower, Corita, Daniel and Cora Sol in the 11th floor of the other tower, with magnificent views to El Avila the mountains that separates Caracas from the Caribbean Sea. This was no coincidence, my mother must have arranged things for her dear friends.

Mischa Cotlar also arrived in Venezuela escaping the asphyxiating political climate in Argentina. Before leaving Buenos Aires Corita had started her lifelong collaboration with Mischa, which spanned for more than 30 years, with more than 30 influential joint papers in harmonic and functional analysis, and operator theory. After Corita left Venezuela in the early 80s, she kept visiting once or twice a year to work with Mischa, in those visits she will stay with my mother. Cora and Mischa will work like crazy for many hours each day, but Cora will return to my mother's house to relax and to enjoy her company.

I was too young to have Cora as my teacher in Caracas, when in turn I decided that after all mathematics was my call. However Cora was instrumental in helping me choose to which graduate schools apply and her support was fundamental to enter Yale. I remember before arriving to New Haven in 1987 spending a week in Washington warming up with Cora and Daniel, as Andrea Nahmod had done the year before, and as Lucas Monzón did the next year when he also came. The rest is history, Cora became part of my mathematical family, or more precisely, I became part of hers. Cora always was there through my professional career to offer support and advise.

In October 2007, Cora helped me and Wilfredo Urbina organize an afternoon in honor

to Mischa Cotlar who had died that January. She came to Albuquerque and stayed with my mother together with María Dolores (Loló) Moran and Stefania Marcantognini who had come from Venezuela. We saw Cora last in April 2009 when she came to Albuquerque and stayed again with my mother for 5 days for the 12th New Mexico Analysis Seminar, she looked well. It was a shock to learn of her passing, hard to accept that such a vital woman and life-long dear friend had left us.

**Wilfredo Urbina:** I met Cora at the Universidad Central de Venezuela where I was doing my undergraduate studies in mathematics. Later I was her TA in an Advanced Calculus course and then in 1978, when I started my master's degree, I had the privilege to take her course *Introduction to Harmonic Analysis*. The notes of that course were the base of her famous book *Interpolation of operators and Singular Integrals* published by Marcel Dekker a year later. It was a very tough course for me but I must say that it had a lasting influence on my career. Also I attended the Analysis Seminar that Mischa and Cora organized and that it is still running today at UCV. Later I went to get my PhD in the University of Minnesota, in principle to study Probability, but I met Gene Fabes so I went back to Analysis, and then back to the things that I had learned from Mischa and Cora in Caracas.

Cora was a real enthusiast of mathematics, willing to help anyone who showed serious interest in studying them. Her solidarity and support for so many mathematicians from Latin America is very well known. Cora's help in the organization of an international conference to celebrate Mischa's 80th birthday in Caracas in January 1994 was invaluable, as well as her help and input was when we organized an afternoon in honor to Mischa Cotlar in Albuquerque in October 2007. When I came back to the States in 2004, due to the political situation in Venezuela, Cora was an important reference for me and I got her support in the painful process of looking for jobs. We met several times in Albuquerque (in October 2007 and April 2009) and in Zacatecas during the Joint meeting AMS-SMM in July 2007; on every occasion we had a wonderful time together, enjoying good mathematics and good food.

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We all met each other through Cora. At a special year in Harmonic Analysis at the MSRI in 1987-1988, she introduced Andrea, Gustavo, Wilfredo, Estela and Rodolfo to each other and we had a great time together. Cora jump started the beautiful friendships and professional relations we have kept among us over the years. Every time we talked to Cora, she asked us what we were up to in mathematics, and she wanted details! She also wanted to know how what we were working on, fitted in the big picture of mathematics. She was very critical about mathematics. She once told us that Antoni Zygmund taught her to judge mathematicians by their theorems; that when someone spoke highly of a mathematician, Zygmund would always like to see the theorems such mathematician had proved. She did the same. If you said to her that you like mathematician X she would ask you to explain his/her mathematics. Cora was a person that always expressed her views

in a very direct way. But she never let disagreements she may have with a mathematics colleague on other issues affect her appreciation of his/her mathematics. When it came to mathematics, Cora indeed judged mathematicians by their theorems.

Cora was a vibrant, strong minded and outspoken woman, who fought all her life for human rights, who helped uncountable young mathematicians without expecting anything in return. Cora was a phenomenal mathematician, in a time when it was not easy for women, and she championed this cause all her life, becoming president of the AWM in the early 90s.

Cora taught all of us by example how to mentor, how to help younger mathematicians pursue their dreams. Cora touched our lives in many ways but she never wanted to be thanked for her good deeds; she believed instead in paying it forward to others. Helping students reach their potential may be the best way to honor her memory. We will deeply miss her.

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