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## Chapter 1 : [blog.quintoapp.com](http://blog.quintoapp.com) | The Laws That Govern the Securities Industry

*20 Using Multiple Methodologies: The Case of Retention in Chicago Ernest R. House References Research in education and the social sciences has changed dramatically over.*

Ascenders as in "h" and descenders as in "p" make the height of lower-case letters vary. There is more variation in the height of the minuscules, as some of them have parts higher ascenders or lower descenders than the typical size. In addition, with old-style numerals still used by some traditional or classical fonts, 6 and 8 make up the ascender set, and 3, 4, 5, 7 and 9 the descender set. Bicameral script[ edit ] This section possibly contains original research. Please improve it by verifying the claims made and adding inline citations. Statements consisting only of original research should be removed. April Handwritten Cyrillic script Writing systems using two separate cases are bicameral scripts. Other bicameral scripts, which are not used for any modern languages, are Old Hungarian ,[ citation needed ] Glagolitic , and Deseret. The Georgian alphabet has several variants, and there were attempts to use them as different cases, but the modern written Georgian language does not distinguish case. Many other writing systems make no distinction between majuscules and minuscules – a system called unicameral script or unicas. This includes most syllabic and other non-alphabetic scripts. In scripts with a case distinction, lower case is generally used for the majority of text; capitals are used for capitalisation and emphasis. Acronyms and particularly initialisms are often written in all-caps , depending on various factors. Capitalization Capitalisation is the writing of a word with its first letter in uppercase and the remaining letters in lowercase. Capitalisation rules vary by language and are often quite complex, but in most modern languages that have capitalisation, the first word of every sentence is capitalised, as are all proper nouns. Capital letters are used as the first letter of a sentence, a proper noun, or a proper adjective. The names of the days of the week and the names of the months are also capitalised, as are the first-person pronoun "I" [6] and the interjection "O" although the latter is uncommon in modern usage, with "oh" being preferred. There are a few pairs of words of different meanings whose only difference is capitalisation of the first letter. Honorifics and personal titles showing rank or prestige are capitalised when used together with the name of the person for example, "Mr. Other words normally start with a lower-case letter. There are, however, situations where further capitalisation may be used to give added emphasis, for example in headings and publication titles see below. In some traditional forms of poetry, capitalisation has conventionally been used as a marker to indicate the beginning of a line of verse independent of any grammatical feature. Other languages vary in their use of capitals. For example, in German all nouns are capitalised this was previously common in English as well, mainly in the 17th and 18th centuries , while in Romance and most other European languages the names of the days of the week, the names of the months, and adjectives of nationality, religion and so on normally begin with a lower-case letter. Informal communication, such as texting , instant messaging or a handwritten sticky note , may not bother to follow the conventions concerning capitalisation, but that is because its users usually do not expect it to be formal. In a similar manner, the Latin upper-case letter " S " used to have two different lower-case forms: The latter form, called the long s , fell out of general use before the middle of the 19th century, except for the countries that continued to use Blackletter typefaces such as Fraktur. When Blackletter type fell out of general use in the mid-19th century, even those countries dropped the long s. Typographical conventions in mathematical formulae include the use of Greek letters and the use of Latin letters with special formatting such as blackboard bold and blackletter. Letters of the Arabic alphabet and some jamo of the Korean hangul have different forms for initial or final placement, but these rules are strict and the different forms cannot be used for emphasis. In Georgian , some authors use isolated letters from the ancient Asomtavruli alphabet within a text otherwise written in the modern Mkhedruli in a fashion that is reminiscent of the usage of upper-case letters in the Latin, Greek, and Cyrillic alphabets. In particular, every hiragana character has an equivalent katakana character, and vice versa. Stylistic or specialised usage[ edit ] The examples and perspective in this section deal primarily

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with the English-speaking world and do not represent a worldwide view of the subject. You may improve this article , discuss the issue on the talk page , or create a new article , as appropriate.

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## Chapter 2 : Letter case - Wikipedia

*Designed for introductory research courses in the professional fields and social sciences, this text acquaints students and beginning researchers with a broad view of research methodologies and an understanding of the assumptions that inform each of these approaches.*

Rules and Regulations Securities Act of Often referred to as the "truth in securities" law, the Securities Act of 1933 has two basic objectives: See the full text of the Securities Act of 1933 Purpose of Registration A primary means of accomplishing these goals is the disclosure of important financial information through the registration of securities. While the SEC requires that the information provided be accurate, it does not guarantee it. Investors who purchase securities and suffer losses have important recovery rights if they can prove that there was incomplete or inaccurate disclosure of important information. The Registration Process In general, securities sold in the U. The registration forms companies file provide essential facts while minimizing the burden and expense of complying with the law. In general, registration forms call for: Registration statements and prospectuses become public shortly after filing with the SEC. If filed by U. Registration statements are subject to examination for compliance with disclosure requirements. Not all offerings of securities must be registered with the Commission. Some exemptions from the registration requirement include: By exempting many small offerings from the registration process, the SEC seeks to foster capital formation by lowering the cost of offering securities to the public. The Act empowers the SEC with broad authority over all aspects of the securities industry. The Act also identifies and prohibits certain types of conduct in the markets and provides the Commission with disciplinary powers over regulated entities and persons associated with them. The Act also empowers the SEC to require periodic reporting of information by companies with publicly traded securities. See the full text of the Securities Exchange Act of 1934 This information, contained in proxy materials, must be filed with the Commission in advance of any solicitation to ensure compliance with the disclosure rules. Solicitations, whether by management or shareholder groups, must disclose all important facts concerning the issues on which holders are asked to vote. Such an offer often is extended in an effort to gain control of the company. As with the proxy rules, this allows shareholders to make informed decisions on these critical corporate events. Insider Trading The securities laws broadly prohibit fraudulent activities of any kind in connection with the offer, purchase, or sale of securities. These provisions are the basis for many types of disciplinary actions, including actions against fraudulent insider trading. Insider trading is illegal when a person trades a security while in possession of material nonpublic information in violation of a duty to withhold the information or refrain from trading. Registration of Exchanges, Associations, and Others The Act requires a variety of market participants to register with the Commission, including exchanges, brokers and dealers, transfer agents, and clearing agencies. Registration for these organizations involves filing disclosure documents that are updated on a regular basis. SROs must create rules that allow for disciplining members for improper conduct and for establishing measures to ensure market integrity and investor protection. While many SRO proposed rules are effective upon filing, some are subject to SEC approval before they can go into effect. Trust Indenture Act of 1939 This Act applies to debt securities such as bonds, debentures, and notes that are offered for public sale. Even though such securities may be registered under the Securities Act, they may not be offered for sale to the public unless a formal agreement between the issuer of bonds and the bondholder, known as the trust indenture, conforms to the standards of this Act. See the full text of the Trust Indenture Act of 1939 Investment Company Act of 1940 This Act regulates the organization of companies, including mutual funds, that engage primarily in investing, reinvesting, and trading in securities, and whose own securities are offered to the investing public. The regulation is designed to minimize conflicts of interest that arise in these complex operations. The Act requires these companies to disclose their financial condition and investment policies to investors when stock is initially sold and, subsequently, on a regular basis. The focus of this Act is on disclosure to the investing public of information about the fund and its investment objectives, as well as on

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investment company structure and operations. It is important to remember that the Act does not permit the SEC to directly supervise the investment decisions or activities of these companies or judge the merits of their investments. See the full text of the Investment Company Act of Investment Advisers Act of This law regulates investment advisers. With certain exceptions, this Act requires that firms or sole practitioners compensated for advising others about securities investments must register with the SEC and conform to regulations designed to protect investors. See the full text of the Investment Advisers Act of Sarbanes-Oxley Act of On July 30, , President Bush signed into law the Sarbanes-Oxley Act of , which he characterized as "the most far reaching reforms of American business practices since the time of Franklin Delano Roosevelt. You can find links to all Commission rulemaking and reports issued under the Sarbanes-Oxley Act at: See the full text of the Sarbanes-Oxley Act of The legislation set out to reshape the U. You can find links to all Commission rulemaking and reports issued under the Dodd Frank Act at: The JOBS Act aims to help businesses raise funds in public capital markets by minimizing regulatory requirements. The full text of the Act is available at:

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## Chapter 3 : Urban Habitats -- Using Citizen Science in Urban Bird Studies

*Survey Research Susan R. Hutchinson Single Subject Experimental Research: An Overview for Practitioners Karen Sealander Experimental Research to Inform Educational Policy Lawrence H. Cross and Gabriella M. Belli Using Multiple Methodologies: the Case of Retention in Chicago Ernest R. House.*

Four themes emerged from the interviews: Quotations will be used to illustrate each of these themes. The numbers following each of the quotations indicate the participant study number. So I just keep to myself, you know? Case managers were the primary social contact for some participants. As one participant described: Some described not having anyone to help them navigate health and social systems, and others described the emotional toll of not having anyone to talk to as a factor contributing to their health. Chest “always had a pain in my chest. It eats you up. Participants repeatedly described feeling less isolated, more understood, and more accompanied. In speaking about his case manager, a participant explained: She is a caring person. You think nobody cares for you, but somebody still does. They recounted decreased feelings of shame as they developed relationships with their case managers, who they perceived as non-judgmental and caring. Feeling cared about, despite recognition of their drug and other problems, was a significant driver of positive change for the participants. I used to feel like I had to hide it, hide something, or not be willing to talk to anybody about it. When somebody cares about you – that makes you feel good. In describing her life before being in the program, one participant said: There was no help. There were no resources. There was just me and my asthma and General Hospital. They appreciated that care managers often accompanied them to medical and social service appointments to help them advocate for themselves. Some noted that prior to the program, they had not wanted to attend those appointments because they were not able to get what they needed. And it made me not want to go. So she [case manager] started going with me and then they started to do things. I said, oh, look at this. Many had tried to get housing or Social Security disability income before entering the program, but had been unable to overcome the barriers they encountered, such as abusive landlords or inappropriate denials of services. To just get one ID. It was being constructed. Anything to get out of here. While participants differentiated the emotional components from the practical components of the case management program, they usually intertwined the two when discussing the impact of the program on their health, and did not indicate that one was more important than the other. One participant described the regular meetings as combining an emotional and a practical need: I feel desperate sometimes to see her. To get my medication plus talk to her about how am I doing, how I feel. A lot of help. She keeps in touch with me. Because of the way she talks to me about life and my dialysis. Prior to enrolling in the program, she had a poor relationship with the health care system and instability of her chronic diseases. This participant emphasized the advocacy and navigational aspect of the program. Negative Feelings about Case Management and Readiness to Leave the Program Participants had very few negative feelings about case management. One participant did not like that she had to have a third party a payee manage her disability income for her, a requirement to gain access to housing. The same participant also did not like that her case manager played a role in limiting her opiate refills. There were no other specific negative comments. None of the participants felt ready to leave the program. Some did not think they would ever be ready, whereas others felt they would be ready to leave when they could manage appointments and medications themselves, felt stable from a mental health perspective, and had other social contacts. Participants identified each as important contributors to their improvement. Examining the Findings in Light of Existing Literature Participants linked their social isolation with their poor mental and physical health; many quantitative studies support this association. Social isolation is common among homeless people. Berkman et al describe a framework in which social networks “the web of social contacts surrounding an individual” provide opportunities for social support, which in turn have psychological, behavioral, and physiologic impact. Social support is further broken down into emotional support caring for others , instrumental support providing goods and services , informational support provision

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of needed information ; and appraisal support giving feedback, problem solving. In this context, social support provided by a care manager was filling a void left by the lack of social network. That participants valued not only instrumental and informational support, but also appraisal and emotional support can be understood in the context of their weak social network being unable to provide any of the equally important forms of social support. Implications for Policy, Practice, and Research Though socially isolated patients need all forms of social support, many case management programs do not explicitly focus on emotional support. While most case management programs incorporate instrumental and informational support, differing levels of focus on emotional and appraisal support could account for variance in outcomes in prior studies of case management programs. For example, if a program focuses on provision of housing instrumental support without focusing on caring interpersonal relationships emotional support , that choice of focus could potentially affect outcomes. How can programs operationalize this focus on emotional and appraisal support? Programs focused on patients who have no social network and who are unable to engage with peers may benefit from the very low staffing ratios and intense focus on social support demonstrated by the program in this study. While costly at the outset, this type of intervention may be what is needed to reduce preventable admissions and costs in the long run. Over time, perhaps one way to allow for graduation of patients from this type of program would be to explicitly focus on increasing social networks, thereby increasing opportunity for social support outside of the case manager relationship. This would depend on the ability of patients to be able to develop relationships with other people. Strengths and Limitations Our study has several strengths. We were able to elicit rich narratives from homeless, chronically ill participants, a population whose voices are rarely heard in health care research. Our qualitative, nonjudgmental approach allowed our participants teach us about the importance of the different types of social support. Their perspectives offer key insights into the value of case management programs. Our study also had limitations. All of the participants were English speaking and received services from the same case management program, so their experiences could be different from patients in other case management programs. Furthermore, since involvement with case management was voluntary, participants who agreed to enroll in the program may have valued health and social interaction more than frequently admitted patients who declined participation in the program. Despite our best attempts at a nonjudgmental approach, participants may still have associated the researchers with the case management program and not felt empowered to share negative feelings about the program. While our sample size was small, our use of established qualitative methods lend internal validity to our findings. Finally, we were unable to tease out which specific components of instrumental, emotional, appraisal, and informational support were most important to our participants. Summary Chronically ill homeless patients account for disproportionate use of hospital resources. Participants in a case management program focused on homeless chronically ill patients perceived that social support was a key component of their success in the program. They described the importance of caring relationships with their case managers in addition to other types of social support. Case management programs should consider including mechanisms to increase social support for participants. For some populations this could include a focus on increasing social networks through peer interventions, and for other populations social support may need to come from the case manager, at least initially. Further research is needed to determine the impact of different types of social support structures within case management programs. In the meantime, case management programs for these populations should consider explicitly including emotional and appraisal support interventions. Finally, clinicians caring for chronically ill homeless patients should ask about social isolation and use available resources, such as case management or community programs, to increase social support for socially isolated patients. We also thank Kathryn Kruse for manuscript editing and Jenna Kruger for manuscript preparation. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript. Br J Gen Pract A Review of the Literature. National Health Care for the homeless Council, Inc. National Coalition for the Homeless Health care and homelessness. Am J Public Health Acad Emerg Med 8: BMC Public Health 7: Ann Intern Med A Review of the Literature and Implications for the Future. Boston Health Care Program. N Engl J Med IHI Innovation

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Series white paper. Institute for Healthcare Improvement. Bodenheimer T, Fernandez A High and rising health care costs. Synth Proj Res Synth Rep. Agency for Healthcare Research and Quality. Medical Management of Vulnerable and Underserved Patients: Principles, Practice, and Populations. Am J Emerg Med

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## Chapter 4 : Table of contents for Library of Congress control number

House, Ernest R. () *"Using Multiple Methodologies: The Case of Retention in Chicago" in Foundations for Research: Methods of Inquiry in Education and the Social Sciences, edited by Kathleen.*

Dice were used to select musical sequences from a numbered pool of previously composed phrases. This system provided a balance of order and disorder. The structure was based on an element of order on one hand, and disorder on the other. Bach could be considered generative, in that there is a strict underlying process that is followed by the composer. He also created works on paper that he then cut into strips or squares and reassembled using chance operations to determine placement. In other works he has used chance operations to determine the coloration of grids. Video feedback is now cited as an example of deterministic chaos, and the early explorations by the Vasulkas anticipated contemporary science by many years. Software systems exploiting evolutionary computing to create visual form include those created by Scott Draves and Karl Sims. The digital artist Joseph Nechvatal has exploited models of viral contagion. Michael Noll, of Bell Telephone Laboratories, Incorporated, programmed computer art using mathematical equations and programmed randomness, starting in The Calmoduline Monument project is based on the property of a protein, calmodulin, to bond selectively to calcium. Exterior physical constraints wind, rain, etc. However, the calcium controls the expression of the calmoduline gene. Martin Wattenberg pushed this theme further, transforming "data sets" as diverse as musical scores in "Shape of Song", and Wikipedia edits History Flow, with Fernanda Viegas into dramatic visual compositions. Using computer algorithms as "brush strokes," Base creates sophisticated imagery that evolves over time to produce a fluid, never-repeating artwork. Software Art For some artists, graphic user interfaces and computer code have become an independent art form in themselves. Adrian Ward created Auto-Illustrator as a commentary on software and generative methods applied to art and design. Jackson Mac Low produced computer-assisted poetry and used algorithms to generate texts; Philip M. Parker has written software to automatically generate entire books. Jason Nelson used generative methods with Speech-to-Text software to create a series of digital poems from movies, television and other audio sources. As with many examples of software art, because live coding emphasises human authorship rather than autonomy, it may be considered in opposition to generative art. In this view both highly ordered and highly disordered generative art can be viewed as simple. Highly ordered generative art minimizes entropy and allows maximal data compression, and highly disordered generative art maximizes entropy and disallows significant data compression. Maximally complex generative art blends order and disorder in a manner similar to biological life, and indeed biologically inspired methods are most frequently used to create complex generative art. This view is at odds with the earlier information theory influenced views of Max Bense [38] and Abraham Moles [39] where complexity in art increases with disorder. Galanter notes further that given the use of visual symmetry, pattern, and repetition by the most ancient known cultures generative art is as old as art itself. He also addresses the mistaken equivalence by some that rule-based art is synonymous with generative art. For example, some art is based on constraint rules that disallow the use of certain colors or shapes. Such art is not generative because constraint rules are not constructive, i. They develop a technical vocabulary that includes E-art electronic art, C-art computer art, D-art digital art, CA-art computer assisted art, G-art generative art, CG-art computer based generative art, Evo-art evolutionary based art, R-art robotic art, I-art interactive art, CI-art computer based interactive art, and VR-art virtual reality art. Related to machine intelligence - can a machine generate something new, meaningful, surprising and of value: Many generative artworks do not involve digital computers, but what does generative computer art bring that is new? For example, what does the use of randomness say about the place of intentionality in the making of art? How could generative art give rise to artefacts and ideas that are new, surprising and valuable? How can we form a more critical understanding of generative art? For example, can the art world be considered a complex generative system involving many processes outside the direct control of artists, who are agents of production

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within a stratified global art market.

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## Chapter 5 : Cameron Todd Willingham - Wikipedia

*Foundations for research: methods of inquiry in education and the social sciences. the case of retention in Chicago / Ernest R. House. Using multiple.*

Subjects Description Designed for introductory research courses in the professional fields and social sciences, this text acquaints students and beginning researchers with a broad view of research methodologies and an understanding of the assumptions that inform each of these approaches. More experienced researchers will also find the book useful in acquainting them with methodologies and theoretical frameworks that are new to them. The text is distinguished by its avoidance of using the discreet categories of qualitative and quantitative methods to organize the chapters. While some chapter authors rely more on one or the other, many employ multiple methodologies to investigate particular problems and questions. Further, the book is not organized into single, contradictory positivist-interpretivist categories of research; chapter authors often situate methodologies within a variety of, and sometimes multiple, theoretical positions, particularly as these approaches are shaped by the historical context of social science research. Focus points in Foundations for Research: Methods of Inquiry in Education and the Social Sciences: Table of Contents Contents: The Critical Incident Technique in Research. More Than a Method of Qualitative Inquiry. Balancing Contentious and Modulating Forces. Roulston, Ethnomethodological and Conversation Analytic Studies. Ethnography and Participant Observation. Noblit, Reinscribing Critique in Educational Ethnography: Critical and Postcritical Ethnography. Lather, Critical Inquiry in Qualitative Research: Feminist and Poststructural Perspectives: Hays, Case Study Research. Sealander, Single-Subject Experimental Research: An Overview for Practitioners. House, Using Multiple Methodologies: The Case of Retention in Chicago. Arts-Based Research in Education: Methods of Inquiry in Education and the Social Sciences.

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## Chapter 6 : Generative art - Wikipedia

*Foundations for Research E.R. House, Using Multiple Methodologies: The Case of Retention in Chicago. About the Series.*

School of Natural Resources, University of Arizona, Tucson, AZ Abstract Long-term monitoring projects and studies designed to survey large, variable areas often face a similar challenge: Researchers can sometimes overcome this obstacle by designing studies that utilize the skills of volunteers, or citizen scientists. Citizen scientists currently play active roles in a wide range of ecological projects, and their contributions have enabled scientists to collect large amounts of data at minimal cost. Because bird-watching is popular among members of the general public, bird-monitoring projects have been among the most successful at integrating citizen scientists. Several large-scale studies, such as the Christmas Bird Count and Breeding Bird Survey, have successfully relied on citizen scientists to collect data. As urban areas expand and scientists work to find ways to manage wildlife in cities, information about the associations among animals and urban environments is needed. By utilizing the large pool of potential participants in urban areas, citizen science-based studies can play an important role in collecting this information. One such study, the Tucson Bird Count TBC, has successfully utilized citizen scientists to collect information on the distribution and abundance of birds across an urban area. The results from the TBC have been used in numerous scientific studies, and they are helping wildlife managers identify important sites for birds within the city, as well as land-use practices that sustain native birds. In many cases, lone professional scientists, lacking the necessary funding and manpower, are unable to gather the broad-scaled yet detailed information that a cadre of citizen scientists can. One area in which citizen scientists are widely utilized is in surveying and monitoring bird populations Lepczyk, The benefits of incorporating citizen science into ecological research are not limited to the quantity of data that can be collected. Citizen science projects can also benefit the volunteers and the broader community. Volunteers not only gain experience in making observations and participating in a scientific study, they may also develop a greater sense of stewardship over the populations or sites they are responsible for surveying or monitoring Carr, Despite the value of volunteers to research programs and the potential benefits to both participants and the broader community, citizen science-based projects have been criticized for lacking scientific rigor Irwin, In order to encourage the participation of volunteers, scientists design programs that attempt to both minimize the time and effort required of participants and maximize the output of usable data. As a result, the design of such programs is often a compromise. The CBC, for example, has been criticized because there is variability in volunteer effort among and within count circles, and because the count circles are not randomly located Dunn et al. Lack of randomly located survey sites is an issue with many citizen science projects because sites tend to be clustered near population centers where the majority of participants live or in ecologically rich areas which participants are more interested in surveying. In response to these concerns, many existing projects have developed innovative ways to standardize data collection Dunn et al. Given the increased interest in citizen science and the development of improved methods of data collection, researchers have begun to explore new opportunities for involving citizen scientists. One area in which there is significant potential for developing citizen science-based projects is in urban centers. Conducting comprehensive studies in urban areas frequently poses challenges to scientists because cities generally are large and consist of variable environments. Collecting representative information from such large, diverse areas requires considerable manpower, and in urban areas citizen scientists can help meet this need. Among the more common types of ecological projects utilizing citizen scientists in urban areas are studies examining urban bird populations. Using information collected by residents, researchers in England have been able to investigate the distribution and geographical abundance of house sparrows *Passer domesticus* throughout London Royal Society for the Protection of Birds, At urban and suburban sites throughout the Washington, D. The Cornell Lab of Ornithology currently has five ongoing citizen science-based studies targeting urban birds Cornell Lab of

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Ornithology, Another project that has utilized citizen scientists to collect data on bird abundances and distributions in an urban area is the Tucson Bird Count Tucson Bird Count, n. The TBC was established in to acquire information about the distribution and abundances of birds throughout the Tucson area. The CBC includes a count circle in Tucson, but due to the nature of this project, surveys occur in the winter, when many species that breed in or migrate through Tucson are not present National Audubon Society, The long-term goal of the TBC is to help identify ways to restore and sustain native bird species Turner, The initial design of the TBC focused on counting birds at random sites covering a wide range of environments throughout Tucson during the breeding season the Route Program. In the Park Monitoring Program, volunteers survey birds in their local parks, washes, or other areas of interest on a quarterly basis. Experience gained from designing the TBC program, recruiting volunteers, making the data available to the public and researchers, and confronting the challenges associated with such a study, can serve as an example for other researchers interested in establishing citizen science-based projects in urban areas. Adjacent sites are grouped into routes, with an average of ten sites per route. Using maps and information available at the TBC website , volunteers select a route or routes to survey. Once a route is adopted, it is unavailable to other volunteers. Click image to enlarge Figure 1. In , randomly located sites on 63 routes in the Tucson area were surveyed Tucson Bird Count, n. With the exception of sites that have been relocated due to changes in accessibility or other disruptive factors, site locations are permanent, allowing for the same sites to be surveyed each year. Tucson has grown by more than 30 square miles since City of Tucson, , and additional sites have been added to the Route Program in newly developing areas around the edges of the city. In , sites on 72 routes were surveyed Tucson Bird Count, n. Due to the volunteer-based nature of the TBC and the fact that participants select the routes they want to survey, there is no guarantee that all routes will be adopted every year. As a result, each year a few routes are not surveyed. To avoid gaps in coverage, routes that were not surveyed one year are given priority the following year, or are surveyed by TBC staff. The Park Monitoring Program Locations monitored in the Park Monitoring Program red stars in Figure 1 were selected by TBC personnel and volunteers and include neighborhood, city, and regional parks, washes, a national park, and other key birding spots referred to as parks here. The number of survey sites per park varies from 3 to 14, depending on the size of the site and the variability of environments contained within the park. Volunteers use a combination of point counts and transects to survey birds at park sites Tucson Bird Count, To make sites monitored in the park and Route Program comparable, five-minute unlimited-radius point counts are conducted at most sites. To reduce the chances of double-counting birds, point-count locations are separated by at least meters, and transects do not cross each other Sutherland et al. Click image to enlarge Figure 2. In order to ensure that data collected in the TBC is of high quality, participants must be knowledgeable birders. To determine if participants meet this criteria, volunteers are required to take a self-test at the TBC website prior to adopting a route. The presence of a large group of active and experienced birders in the Tucson area has been key to both the establishment and continuation of the TBC. Since , new volunteers have been recruited through presentations about the TBC by project personnel, articles in the local media, and referrals from existing volunteers. In , 51 primary observers and 30 additional observers participated in the Route Program, and 7 primary observers and 6 additional observers participated in the Park Monitoring Program. In , 58 primary observers and 29 additional observers participated in the Route Program, and 21 primary observers and 18 additional observers participated in the Park Monitoring Program. To decrease the time and effort required of TBC personnel in recruiting new volunteers, an emphasis is placed on retaining skilled volunteers. The motivation for volunteers to initially and persistently participate in the TBC is in many cases related to the goal of collecting data that will be used to help sustain native birds in Tucson. All TBC participants are skilled birders, thus a project designed to aid in bird conservation and identify the distribution and abundances of birds throughout Tucson is closely aligned with the interests of the participants. Providing people with options that meet their level of interest in the program also aids in volunteer retention. For example, TBC participants can choose to take part in either or both the Route Program or the Park Monitoring Program, depending on their interests. Additional options are

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offered to participants as they select their route or park to survey, and they can change their selections from year to year. Participants changing the areas they survey could potentially reduce the consistency of results, but excessive changes have not happened. Rather, allowing participants this freedom and flexibility of selection has helped them find areas they are interested in monitoring long-term. [Click image to enlarge Figure 3.](#) Finally, connectedness is maintained between TBC personnel and project participants in several ways. First, the results submitted by each TBC participant are available immediately and publicly on the TBC website, so volunteers are able to see how their results fit into the overall project. At the website, participants can register for the TBC, take the required self-test, view a map of available routes, select a route or park to survey, enter their data, and view results. Enabling participants to carry out these administrative tasks themselves reduces the burden on TBC personnel and speeds up the process. An additional benefit of participants entering their data via the website is a decreased risk of transcription mistakes, as participants themselves as opposed to TBC personnel are entering data that they recorded. To further ensure the validity of the data, TBC staff review all count results submitted, correct obvious errors, and contact participants to verify any unusual or unexpected observations. Results entered by participants are publicly available in real time on the TBC website in tabular format and as distribution maps. As a result, during each survey period, the tables and maps are constantly updated as participants enter new data. By clicking on any of the survey sites on a distribution map, users can view which other species were observed at the site. The results and distribution maps from previous Route and Park Monitoring Program surveys can also be viewed at the website, allowing users to see how the distributions or abundances of various species have changed over time. [Click image to enlarge Figure 4.](#) The results and information available at the TBC website are also intended to inform researchers and local decision makers about the TBC and the data available from it. One of the advantages of having the TBC data in a digital database is that this data can be easily accessed by other users [Dunn et al.](#) The TBC website contains a listing of projects, presentations, and publications that have made use of the TBC data so far. Results General Species Distribution Patterns Data collected by citizen scientists through the TBC has enabled the generation of detailed Tucson-area distribution maps for more than bird species. These maps indicate that many species follow distinct distribution patterns in Tucson. Other distribution patterns are apparent in the data, including the restriction of some species to riparian areas and the concentration of others in areas of relatively dense native woodlands [Turner](#). Some bird species, such as mourning doves *Zenaidura macroura*, Gila woodpeckers *Melanerpes uropygialis*, and house finches *Carpodacus mexicanus* have been counted in relatively high numbers at almost every survey point [Figure 4](#). Yet species more sensitive to development, such as the rufous-winged sparrow *Aimophila carpalis*, are found in relatively small numbers and only at the very edges of the city [Figure 5](#). [Click image to enlarge Figure 5.](#) Distribution and abundance of rufous-winged sparrows across the Tucson Bird Count Route Program study area. Differences Between the Route and Park Monitoring Programs Since the initiation of the TBC in 2002, participants have recorded more than 100,000 birds representing 150 species. A total of 100 species have been recorded through the Route Program, and a total of 150 species have been recorded through the Park Monitoring Program. Fifty-four species observed through the Park Monitoring Program have not been counted through the Route Program. This difference is largely attributable to two factors. First, Tucson has a semiarid climate, and wetlands are relatively rare among the randomly located sites in the Route Program; however, several of the locations monitored in the Park Monitoring Program contain ponds, lakes, or rivers. As a result, many water-associated species, such as the American wigeon *Anas americana*, have only been observed at park locations [Figure 6](#). Despite these differences, both programs are complimentary projects designed to provide us with a better understanding of the distribution and abundance of birds in Tucson, as well as which sites are particularly important for birds. Through the Park Monitoring Program, we collect year-round data at several bird-rich sites, and this helps us develop a more complete picture of all the bird species that occur in Tucson and evaluate the importance of these park locations to birds. Challenges and Lessons Learned While the TBC is an example of how citizen science and urban ecological monitoring can be integrated, executing such a program poses challenges. With

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the TBC, this hurdle is overcome in survey design routes are arranged so that multiple observers cover any one part of Tucson and during data analysis patterns of distribution and abundance are analyzed at broad scales, rather than at specific points, reducing potential observer biases. The volunteer nature of a citizen science-based project also poses challenges.