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Thirty years later: Locating and interviewing participants of the Chicago Longitudinal Study

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Abstract

Retaining study participants over time is essential for longitudinal studies to prevent selection bias and to achieve their long-term goals. The present paper examines the extent to which participants can be retained in a 30-year longitudinal study when a multi-pronged approach is employed. The paper specifically describes the approach that was used to locate and interview participants of the Chicago Longitudinal Study (CLS), three decades after the study began. The CLS is a prospective cohort investigation that examines the effects of the Child-Parent Center (CPC) program, a school-based intervention for low-income children from preschool through 3rd grade. The original CLS sample included a complete cohort of 1,539 children who were born in low-income areas in 1979–1980 and attended kindergarten in 1985–1986 at Chicago Public Schools. The CLS conducted a follow-up survey when participants were approximately age 35. After relatively slow initial progress, CLS researchers developed a comprehensive strategy to locate and interview participants, including: (a) adoption of detailed, manualized tracking protocol, (b) utilization of multiple search platforms, ranging from public search engines to social media, (c) assistance from state correctional facilities, and (d) neighborhood canvassing and in-person interviews. This tracking and interview process facilitated 735 completed interviews within 27 months, compared to 370 completed interviews in the 32 months prior to the launch of the comprehensive tracking protocol. Altogether, 1,105 interviews were conducted, representing an effective completion rate of 76.5%. Recommendations for strengthening response rates in other longitudinal studies are discussed.

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Keywords

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Longitudinal studies are critical for advancing the understanding the lifelong process of human development. Researchers conducting longitudinal studies face a myriad of challenges, including loss of participants over time (attrition). Retaining participants over time is essential for longitudinal studies to prevent selection bias and to achieve their long-term goals (e.g., evaluating the long-term effects of treatment/intervention). Significant attrition can hinder the detection of intervention effects by creating non-representative groups and reducing statistical power (Prinz et al., 2001). For example, participants who are lost to attrition are commonly higher risk and more residentially mobile than participants who are not lost to attrition (Ribisl et al., 1996). Selective attrition thus threatens both the internal and external validity of research findings. Researchers have noted that two aspects of selective attrition can potentially be controlled: losing contact with participants over time, and participants refusing to continue to participate (Cotter, Burke, Loeber, & Navratil, 2002).

Longitudinal clinical research studies have become increasingly common in recent years, necessitating the identification of effective participant retention strategies (Robinson, Dennison, Wayman, Pronovost, & Needham, 2007). Several comprehensive reviews and meta-analyses on participant tracking and retention strategies have been published in health fields (Abshire et al., 2017; Robinson et al., 2007; Robinson et al., 2015; Teague et al., 2018). Tracking and retention strategies in longitudinal studies were discussed in social science venues (Clarridge, Sheehy, & Hauser, 1978; Coen, Patrick, & Shern, 1996; Cotter et al., 2002; Cotter, Burke, Stouthamer-Loeber, & Loeber, 2005; Cottler, Compton, Ben-Abdallah, Horne, & Claverie, 1996; Haggerty et al., 2008; Hampson et al., 2001; Lyons et al., 2004; Navratil, Green, Loeber, & Lahey, 1994; Prinz et al., 2001; Ribisl et al., 1996), but only a few studies have been published in the last decade – a period of significant social and technological changes (Baxter et al., 2012; Flores et al., 2017; Hanna, Scott, & Schmidt, 2014; Williams & O'Donnell, 2014). Unfortunately, the data collection processes outlined in these extant papers have received little attention in the broader scientific literature. Several other studies have reported their participant tracking and retention strategies in non-peer-reviewed publications, such as technical reports (e.g., Love et al., 2001; Tourangeau, Nord, Lê, Sorongon, & Najarian, 2009). Moving forward, the field will benefit from comprehensive reports on strategies that have led to high retention rates in longitudinal studies, particularly multi-decade studies.

The purpose of the present study is to describe the strategies that were used to track and retain participants in the Chicago Longitudinal Study (CLS) – a large, prospective study of a low-income cohort – three decades after the study began. The present paper begins by briefly reviewing previous studies that have discussed strategies for locating and retaining participants over time. This review lays a foundation for the empirical portion of the paper, which describes and analyzes the protocol that was recently used to locate and interview participants of the CLS.

Locating and Retaining Participants

Several peer-reviewed reports have described strategies for re-locating and interviewing participants in longitudinal follow-up studies in social science (Cotter et al., 2002; Cottler et al., 1996; Flores et al., 2017; Hanna et al., 2014; Lyons et al., 2004; Navratil et al., 1994). The original study samples described in these reports ranged from 150 to 500 participants, with the exception of two reports that described original sample sizes exceeding 500 participants (Coen et al., 1996; Hampson et al., 2001). The majority of these reports conducted final follow-up assessments no more than five years after baseline. A smaller number of studies described strategies that were used to re-locate and examine participants more than five years after baseline (Cotter et al., 2005; Haggerty et al., 2008; Hampson et al., 2001; Lyons et al., 2004). Several studies focused on non-Caucasian or low-income samples (Cotter et al., 2002; Cotter et al., 2005; Flores et al., 2017; Haggerty et al., 2008). Notably, none of the studies began in early childhood. Several recent national longitudinal studies, such as Early Childhood Longitudinal Study Kindergarten Class of 1998–99 (ECLS-K, 1998) and the Early Head Start Research and Evaluation Project (EHSREP), have described their tracking strategies in user manuals (Tourangeau et al., 2009) or technical reports (Love et al., 2001).

Strategies for tracking participants.

Review of the extant literature underscores the importance of setting the stage for longitudinal work at the beginning of the study. Two important steps include collection of detailed participant contact information and entering this information into an electronic database. Guidelines for collecting contact information have been discussed extensively in the literature (Cotter et al., 2002; Hampson et al., 2001; Lyons et al., 2004). Whenever possible, it is important to collect participants' demographic and contact information at the study outset, including full name (including middle name), race/ethnicity, gender, date of birth, school, parents/guardians' name (if participants are children), phone number, mailing address, and email address. It has also been recommended that researchers request contact information for at least two people who will know how to get in touch with a participant if the researchers cannot locate him or her (Navratil et al., 1994; Ribisl et al., 1996). It is important for researchers to update participants' contact information at each follow-up and that they invite participants to update their information between follow-ups as needed (e.g., address changes due to residential moves, name changes due to marriage). Electronic databases allow researchers to efficiently record all contact information and contact attempts (Coen et al., 1996).

Internet searches.—Many participants change residences over time, making their previous contact information invalid. Review of the literature indicates that one of the most important strategies for tracking mobile participants is to search for their new contact information using various tools. Several peer-reviewed studies provide good summaries on tracking strategies (Haggerty et al., 2008; Hampson et al., 2001; Williams & O'Donnell, 2014). In this digital age, a great deal of information can be obtained online. For example, online people-finder databases often provide phone numbers and mailing addresses. These databases can be free or fee-based; fee-based databases often provide more comprehensive

records. Depending on the nature of a study's sample, specific databases may be especially useful for locating participants (e.g., the National Death Index (NDI), state court and voter registration records, Department of Motor Vehicles (DMV) records) (Haggerty et al., 2008). Researcher persistence and ingenuity are important factors that affect the success of participant tracking (Clarridge et al., 1978).

Contacting participants.—The validity of contact information collected via internet searches can only be confirmed by attempting to contact the participant. If the information is found to be invalid, additional searches must be conducted. Depending on the nature of a particular study, several approaches can be used to contact participants, including mailings, phone calls, canvassing, and community outreach (Hampson et al., 2001; Sullivan, Rumptz, Campbell, Eby, & Davidson, 1996). For example, the ECLS-K 1998 study conducted in-person visits to participants' last-known addresses and attempted to obtain updated contact information from neighbors (Tourangeau et al., 2009).

Strategies for retaining participants.

Previous research has identified several strategies for retaining longitudinal study participants (Flores et al., 2017; Stouthamer-Loeber, Van Kammen, & Loeber, 1992; Sullivan et al., 1996). First, it is crucial that researchers clearly explain the purpose and importance of the study, to enhance participant commitment (Coen et al., 1996). Second, offering flexible scheduling for follow-up appointments is essential, given that many participants may have busy schedules or limited transportation (if data collection is occurring in-person) (Coen et al., 1996). Third, researchers should carefully consider issues related to participant payment. Compensating participants for their time and effort may enhance motivation to participate in future follow-ups (Gebreselassie, Stephens, Maples, Johnson, & Tucker, 2014; Haggerty et al., 2008). Fourth, it is often helpful to provide reminders about follow-up appointments to participants, to minimize the chances that they will forget about appointments (Sullivan et al., 1996; Teague et al., 2018). Fifth, during follow-ups, participants should be reminded that they are allowed to skip any questions that they do not feel comfortable answering (Coen et al., 1996). Finally, longitudinal study participants who express hesitation about participating in a follow-up but who do not clearly decline to participate may be counted as 'soft refusals'. At the discretion of their institution's Institutional Review Board, researchers might consider reaching out to these participants again after some time has elapsed to see if they are open to learning more about the study.

At-Risk Participants and Early Childhood Longitudinal Studies

Longitudinal study attrition is significantly higher among participants from non-Caucasian and low-income backgrounds (compared to Caucasian and higher-income participants) (Baxter et al., 2012). Participants from these backgrounds often face significant stressors (e.g., low resources, high residential mobility) which make it difficult for them to participate in longitudinal research (Santiago, Wadsworth, & Stump, 2011). These challenges have contributed to a paucity of longitudinal social science studies that have collected data with diverse samples ten or more years after baseline. The few studies that have extended beyond a decade have typically had small baseline sample sizes (e.g. less than 200 participants),

such as the High/Scope Perry Preschool Study (Schweinhart et al., 2005) and the Abecedarian Project (Campbell et al., 2012), raising concerns about low statistical power and generalizability of findings (Ioannidis, 2005).

Larger studies, even if they possess substantial expertise and resources, face unique challenges to successful follow-up. Early childhood intervention studies with sample sizes exceeding 200 participants have often demonstrated relatively high response rates over time. Leading examples include the Infant Health and Development Program (born in 1984–85; 65% up to age 18; McCormick et al., 2006), the Houston Parent-Child Development Center (born between 1971 and 1979; 63% up to age 18; Johnson & Blumenthal, 2004), the Early Head Start Research and Evaluation Project (EHSREP) (born between 1996 and 1998, 54% up to age 10; Vogel, Xue, Moiduddin, Kisker, & Carlson, 2010), and the Consortium for Longitudinal Study (born in the 1960s; 55% up to age 22; Consortium for Longitudinal Study, 1983). Notably, however, few of these studies followed participants into adulthood. Some longitudinal intervention studies do not conduct long-term follow-ups (e.g., 10 years past baseline) because initial follow-ups reveal no immediate intervention effects. Studies that do find early impacts may be more likely to conduct long-term follow-ups, to assess whether intervention effects are sustained over time. However, the response rates of these long-term follow-ups vary.

For example, the High/Scope Perry Preschool Study and the Abecedarian Project are well known early childhood longitudinal studies that followed participants into mid-life. Both studies reported over 95% retention rate of living participants. The tracking strategies of the two studies were described briefly in some publications with limited details (Campbell et al., 2012; Schweinhart et al., 2005). Moreover, some longitudinal studies with large, nationally representative samples have intentionally followed up with only part of their original study samples. For example, the eighth-grade follow-up sample pool in the Early Childhood Longitudinal Study Kindergarten Class of 1998–99 (ECLS-K) is less than half of the original kindergarten sample (Tourangeau et al., 2009). These findings underscore the need for strategies to facilitate long-term follow-ups and high response rates in longitudinal studies.

The Present Study

The present study describes the procedures that were used to locate and interview participants of the Chicago Longitudinal Study (Chicago Longitudinal Study, 2005) in early midlife, three decades after the study began. The primary research question addressed is the extent to which participants can be retained in a multi-decade longitudinal study using a multi-pronged approach.

The CLS is an ongoing prospective cohort investigation of the effects of the Child-Parent Center (CPC) program, a school-based early childhood intervention that provides educational and family support services to low-income students and their families from preschool through 3rd grade (Reynolds, 2000). The original CLS cohort included 1,539 participants who were born in 1979–1980 and who attended early childhood programs in low-income Chicago Public School (CPS) districts between 1983 and 1986. 93% of the

original sample was African American; 7% were Hispanic. 989 participants attended 20 CPC sites beginning at age three, and 550 attended alternative early childhood programs at five randomly selected Chicago Public Schools. A prospective cohort study of this size and scope had not been implemented previously by the district, yet the potential benefits of the research were clear. For example, the study aimed to begin addressing in knowledge about the effects of participating in large-scale early childhood programs (e.g., are sustained effects possible, or do benefits "fade out" over time?)

The CLS entered its 33rd year of operation in 2019. Over the years, participant, parent, and teacher surveys have been collected, as well as administrative school and government records. Data collection has followed phases corresponding to early childhood and school transition, middle childhood, adolescence, the end of high school, and early adulthood (ages 20–21 and 22–24) to assess the long-term effects of CPC participation. Results have highlighted significant benefits of CPC participation on multidimensional well-being (Reynolds, Temple, Ou, Arteaga, & White, 2011; Reynolds et al., 2007; Reynolds, Temple, Robertson, & Mann, 2001), high economic returns (Reynolds, Temple, White, Ou, & Robertson, 2011), and the mechanisms of change (e.g., cognitive and motivational advantages, enhancements in socio-emotional development) (Reynolds & Ou, 2011).

Given the positive effects of CPC participation that were documented into early adulthood, it became important for researchers to examine whether those effects are sustained into mid-life. When participants completed surveys in early adulthood, they were asked if the CLS could contact them again in the future. As such, an additional follow-up survey was conducted when participants were in their late 30s (the "Age 35 survey"). The Age 35 survey was the most comprehensive CLS survey that had been administered to date. It included measures of educational attainment, economic wellbeing, physical and mental health, criminal justice system involvement, adverse childhood experiences, community involvement, and more, and took about two hours to complete.

The Age 35 survey was launched in August 2012, with a goal of surveying 1,200 participants. At that time, CLS researchers formed a partnership with a research center at a local university in Minnesota ("Center X") to begin locating and contacting participants. Center X used the CLS database and several online subscription-based databases to locate participants, and contacted participants through calling and letter mailing. When participants consented to participate, Center X administered the Age 35 survey to them by phone. By the end of February 2013, 142 participants had completed the survey by phone. Hoping to accelerate data collection, the CLS Project Director decided to move the survey operation to another research center at a university in Illinois ("Center Y") in March 2013. Center Y used the CLS database and multiple subscription-based databases to locate participants, and contacted participants via calling and letter mailing. Center Y offered participants the option of completing the survey via phone or mail. It also added the option of completing the survey online in November 2013. Center Y completed 228 interviews by the end of March 2015, for a total of 370 completed interviews between the two Centers. Thus, in two-and-a-half years of data collection, less than one-third of the target 1,200 interviews had been completed.

Based on these results, in spring 2015 the CLS Project Director decided to launch a Minnesota-based “CLS tracking team” to facilitate participant locating and interviewing, while shifting Center Y’s focus to conducting phone interviews. During the data collection phase, a comprehensive strategy was developed to locate and interview participants. This strategy, which included the adoption of detailed, manualized tracking protocol and the utilization of multiple search platforms, greatly enhanced the success of the project.

Contribution of the present study.

This study is unique in several respects. First, the present study contributes to the understanding of how to conduct longitudinal follow-ups in a strategic and systematic way, which have received little attention in the scientific literature. Like many studies, the CLS was not originally intended to include multi-decade follow-up. When data collection for the Age 35 survey began, the CLS sample had not been tracked or contacted for ten years, and some participants had not been successfully contacted in nearly 20 years. Furthermore, much of the contact information that participants had provided during previous follow-ups was no longer valid due to high residential mobility in adulthood. The standard tracking strategies used by Centers X and Y were not sufficient to overcome these challenges, requiring CLS researchers to develop creative strategies for achieving a high retention rate. Some of these strategies are unique to the CLS; however, the majority could be translated to other studies that are interested in relocating their participants. Second, the study contributes to the understanding of the procedures of interviewing incarcerated participants, which is rarely described in the literature. Finally, the study adds to the literature by describing the strategies that were utilized to locate and interview a large, low-income, racial/ethnic minority sample.

Method

The CLS tracking team was launched in April 2015 with a goal to increase the participant retention rate for the Age 35 survey. In addition to the standard tracking strategies utilized by the two Centers, a multi-pronged approach was developed. Three key components of the tracking operation will be described herein: (a) the CLS tracking team; (b) the tracking process; and (c) participant engagement techniques related to the scheduling and interviewing processes. Importantly, all study procedures described herein were approved by the CLS’ home institution’s Institutional Review Board (IRB).

The CLS Tracking Team

The organizational structure, roles, and responsibilities of the CLS tracking team are described herein. Tracking team staff included: (a) undergraduate and graduate research assistants at a local university in Minnesota; and (b) on-the-ground canvassers. Desired qualifications for tracking staff included strong interpersonal skills, organization skills, and cultural sensitivity. During its highest workload period, the tracking team consisted of four graduate research assistants, thirteen trackers/interviewers, and five on-the-ground canvassers. All tracking activities were overseen by the CLS ‘Leadership Team’, which consisted of a doctoral-level research associate and two graduate research assistants.

Training.—Graduate assistants in the Leadership Team trained staff in study procedures. Staff were required to: (a) complete online human subjects research training; (b) read a detailed project manual and the Age 35 survey; (c) view online videos on the history of the CPC program; and (d) view a one-hour training video on the Age 35 survey. Staff also attended a one-hour in-person training which included a review of study protocol, instruction in utilizing study databases, and role-plays of survey administration.

Roles and responsibilities.—Staff roles evolved over time based on various factors (e.g., staff size and work performance). In general, staff members were assigned to fulfill at least one of the following roles: (a) tracker; (b) interviewer; or (c) canvasser. Trackers were assigned subsamples of participants to locate. These subsamples were typically based on participants' high school or on their state of residence (for participants living outside of Illinois). Grouping participants in this manner enabled trackers to become closely familiar with their assigned participants, the schools that they attended, and other relevant details. Interviewers contacted participants to schedule interviews and completed phone interviews, or occasionally in-person interviews, with participants. Canvassers visited participants' addresses, provided participants and their family members with information about the CLS, and attempted to complete the Age 35 survey on-the-spot or to schedule phone interviews for later dates. Special and challenging cases (e.g., participants with high-profile careers; participants with communication difficulties) were referred to the Leadership Team.

Supervision.—Project meetings were held on a weekly to biweekly basis. The Leadership Team presented up-to-date recruitment statistics and provided didactic instruction in study protocol. Staff submitted weekly updates using a standardized online form to report their progress in tracking and interviewing their assigned participants. This data was presented in aggregate format at project meetings and was tracked over time. Staff also provided verbal updates on their assigned participants and shared challenges and ideas for new strategies. The Leadership Team also monitored the emotional wellbeing of interviewers who had challenging interactions with participants. Staff were asked to briefly reflect on their progress and to identify personal goals for the upcoming week (e.g., finish a survey with a particular participant). Celebrations with food were held for every 100 completed surveys to increase staff morale.

Incentive system.—Tracking participants can be a tedious process and requires significant patience and attention to detail. Moreover, administering the Age 35 survey often took one to two hours, requiring additional patience and communication skills. Thus, an incentive system was implemented to enhance staff morale. Trackers were awarded bonuses for every five participants that they located who completed surveys; interviewers were awarded bonuses for every five interviews that they conducted.

Confidentiality.—Safeguarding confidentiality is of the utmost importance to maintaining participant trust and compliance with ethical standards. Several strategies were implemented to protect confidentiality. First, all staff were required to complete online modules on human subjects research and confidentiality through the Collaborative Institutional Training Initiative (CITI). Second, hard copies of participants' surveys were de-identified and stored

in locked cabinets. Third, participants' data were de-identified in electronic databases and stored on secure institutional servers. Finally, participants were reminded of the confidential nature of the study at the commencement of the survey.

Tracking Process

Manual.—The Leadership Team composed a comprehensive manual to guide staff. The manual included: (a) historical information and frequently-asked-questions about the CLS; (b) employment, ethics and safety guidelines; (c) detailed protocol for locating and contacting participants, including login information for all project databases and online search databases; (d) detailed protocol for communicating with participants, scheduling and conducting interviews, including sample scripts for phone/text/email; (e) crisis management instructions and referrals to social services (e.g., suicide hotline); (f) information about participant payments and referrals; (g) instructions for administrative tasks (e.g., processing mail, updating records); (h) staff contact information; and (i) tips from experienced project staff. The manual was regularly updated to reflect evolving protocol.

Recordkeeping.—Trackers initially documented their tracking efforts informally in an institutional shared drive. Over time, given a large number of participants and trackers, a need for more organized and uniform recordkeeping became evident. The Leadership Team created Excel templates for recording participant information.

Search tools.—Several search tools and database were utilized in the project. They are described briefly below.

CLS database.: The CLS database includes over three decades of data from participants, parents, and teachers; educational records; government records; and records of contact information from batch data services (e.g., Alumnifinder). With the cooperation of many agencies that have provided data to the CLS over the years, the CLS database is essential in tracking the study participants. Educational records include k-12 records from the Chicago Public School (CPS) and postsecondary education records from the National Student Clearinghouse. Government records include official court records from Cook County Illinois, employment records from Illinois Department of Employment Security (IDES), Illinois Department of Motor Vehicles (DMV) records, voter registration records, and National Death Index (NDI) records. Both educational and government records are instrumental in locating CLS participants.

When a tracker was assigned a new participant, he or she searched the CLS database to see whether there was any information indicating that the participant: (a) had changed their last name (e.g., due to marriage); (b) had a history of incarceration; (c) was a registered sex offender; (d) were employed; and (e) had enrolled or had degrees in postsecondary education. Trackers also searched the database for other information that might help to locate the participant. For example, during the Age 22–24 survey, participants provided information about their education, employment, place of residence, and household members, as well as contact information for an associate who would always know where to find them.

Online tracking tools.: The tracking team utilized a variety of paid and public search engines, including LexisNexis, US Search, Intelius, CheckPeople, BeenVerified, Spokeo, Google, and more. These databases compile information from various public records (e.g., social media, mobile phone records, and employment data). Trackers searched for addresses, phone numbers, email addresses, and more using participants' full names, date of birth, and previous addresses. Project staff found LexisNexis to be the most reliable and comprehensive source of information; however, it was often beneficial to search multiple databases since databases varied in their sources of information and the frequency with which they were updated. Table 1 summarizes the tracking tools and social media used in the CLS.

Crime database.: The tracking tools used to locate incarcerated individuals included: (a) State online inmate searches; (b) Federal inmate database; (c) online court records search; (d) Google; and (e) the Cook County Jail inmate locator. Each state has its own online inmate database. Trackers were encouraged to primarily search Illinois, Wisconsin, and Minnesota inmate locators, given that participants grew up in Chicago. However, if a participant's last known address was in a different state or if there was a reason to believe that a participant lived elsewhere, inmate searches were also conducted in that state, as well as surrounding states. When available, online court records were used to identify the potential incarceration status of a given participant, as well as clues on what state they may be incarcerated in. Unfortunately, only select states allow public access to court records. Therefore, Google searches became a critical step in the tracking process. Google searches were helpful and occasionally provided news articles with information on a participant's criminal justice system history, incarceration status, and location. The Cook County Jail inmate locator was available through the Cook County Sheriff's Office and was primarily used when attempting to locate participants who resided in Chicago.

Contact approaches.—The CLS attempted to contact participants in multiple ways. These strategies are described briefly below.

Social media and email.: Internet access and social media usage dramatically increased between the times of the Age 22–24 survey (early 2000s) and the Age 35 survey (late 2010s). These trends have created exciting opportunities, as well as unique ethical and methodological challenges, for researchers who wish to contact participants online. Above all, it is critical to take proactive steps to maintain participants' confidentiality and to provide participants with information that will allow them to make informed decisions about whether they wish to engage with researchers through electronic venues. Of course, procedures for contacting participants through these venues should always be approved by Institutional Review Boards (IRB).

During the Age 35 survey, the CLS maintained Facebook and LinkedIn accounts and sent "friend requests" to participants through these venues. Several steps were taken to ensure transparency. Account names and biographies clearly indicated that the accounts were administered by the CLS team, and were set to "public" viewing mode so that participants could make more informed decisions about whether to accept or decline friend requests. When participants accepted the CLS' friend requests, staff sent them a private message that

again disclosed that the account was administered by the CLS team and invited questions or concerns. To maintain participant confidentiality, staff primarily contacted individual participants through private message. Staff occasionally posted publicly visible notes (e.g., on the Facebook account's "wall") that provided updates on CLS data collection and research findings. The CLS also maintained an institutional project email account that staff members used to email participants. The use of shared project social media and email accounts (versus individual staff accounts) allowed the Leadership Team to maintain detailed records of all communications with participants. The Leadership Team regularly reviewed the communications occurring through these accounts for compliance with study procedures and ethical standards.

Telephone and text.: The CLS maintained several telephone lines: (a) a toll-free landline for participants to call; (b) a main study cell phone which a study staff member always carried, and several other study cell phones which other staff could use in evenings and on weekends; and (c) a Google Voice line with a Chicago area code that all staff had access to for calling and texting. One consistent phone number was offered for participants to text or call back in order to minimize confusion.

Tracking protocol.—The previously described search and contact processes involved multiple steps, and had to be tailored to the unique aspects of each participant case. Over time, the Leadership Team refined this process to maximize efficient use of time and resources, while maintaining IRB compliance. Figure 1 displays the final CLS tracking process. First, trackers reviewed the existing CLS database. Based on this information, they called and texted any possible participant phone numbers, sent emails, sent physical mail, and/or sent promising addresses to on-the-ground canvassers. If the latter steps did not yield a survey completion, trackers searched for participant information using the LexisNexis database, other search engines, and social media. If all of these efforts were unsuccessful, the tracker then repeated these processes for the participant's associates, including his or her parents and any individuals listed as contact persons on the Age 22–24 survey.

Trackers were encouraged to follow the tracking sequence displayed in Figure 1; however, creativity and perseverance were often essential to locating participants. For example, trackers obtained information about numerous participants' occupations, criminal justice system involvement or deaths through obscure websites and online newspaper articles. Pictures and posts on participants' publicly available social media pages often provided clues about their location, marital status, and other details. Locating participants took considerable effort, especially because many participants changed residences frequently. In some cases, it took as many as six hours to locate information for one participant.

Physical mail: Invitation letters were mailed to participants' last known addresses at the commencement of the survey. During the tracking process, several letters, newsletters, and postcards were also mailed to participants who had not yet completed the survey. These mailings included updates on the ongoing survey and were designed to be visually appealing. Some were strategically mailed near public holidays (e.g., Thanksgiving) and included well wishes for participants. Address service was requested for all mailings and

detailed records were maintained about returned mail, which indicated expired or invalid addresses.

Phone calls and text messages.: Trackers called and texted participants' potential phone numbers, keeping detailed records about the timing and status of each call (e.g., voicemail left, disconnected, wrong numbers). Participants were significantly more likely to answer and return calls in the evenings and on weekends. Trackers avoided calling or texting the same number too frequently to avoid irking participants. The study manual included sample scripts for trackers to utilize when calling and texting participants. Trackers were trained to avoid sounding too "scripted", which would likely raise skepticism among participants in this era of telemarketing and 'spam' calls. Trackers were instructed to maintain a casual but professional tone when calling participants, which was generally well-received.

Canvassing.: The CLS research team is currently located in the Twin Cities area. With IRB approval, on-the-ground canvassers were launched in early July 2015 for three areas: Chicago, IL; Milwaukee, WI; and the Twin Cities, MN. During the hiring process, canvassers underwent institutional background checks in addition to the previously described training. Trackers provided the Leadership Team with promising potential addresses for participants. These addresses were compiled and electronically mapped for canvassers. Canvassers visited the addresses on weekends and maintained detailed notes about their findings (e.g., whom they spoke to, whether the property was vacant). This strategy proved to be very helpful for locating participants who were hard to reach via mail and phone. Chicago canvassers were able to complete quite a few face-to-face interviews during door-to-door canvassing.

Referrals.: The cooperation of participants' family members and friends has been essential since the beginning of the CLS, particularly as many participants have married and moved. During the Age 35 survey, any individual who provided information which led to a survey completion received a small gift card (e.g., participants' parents, neighbors, classmates, and friends). Participants were also asked about referrals at the end of the Age 35 survey. Interviewers explained the referral process to participants and asked if they were still in touch with any of their elementary or high school classmates who were also CLS participants.

Community outreach.: Many CLS participants continue to live in the neighborhoods where they grew up, and some even have children who attend the same CPCs and schools that they did. Tracking staff posted flyers about the Age 35 survey at select CPC centers that participants attended. Head Teachers and School-Community Representatives (SCR) at some CPC centers also provided help to locate study participants.

Incarcerated participants.: A major goal of the Age 35 survey was to collect data with a sample that was representative of the original cohort. Thus, it was important to include incarcerated participants. The CLS tracking team developed a specialized protocol for tracking and contacting incarcerated individuals, with IRB supervision. At the beginning of the tracking process, the incarceration status of all participants was determined through extensive searches using the tracking tools described above. Monthly online searches were

also completed for participants who had not completed the survey, which proved to be a valuable strategy for locating individuals who had recently become incarcerated. Over time, this strategy evolved and trackers focused their monthly incarceration database searches on male participants and participants with histories of criminal justice system involvement. If a participant was found to be incarcerated during the tracking process, the participant's information was sent to a staff member (the 'Incarcerated Participant Coordinator') who was responsible for tracking incarcerated participants and overseeing communication with correctional facilities.

Participant Engagement Techniques- Scheduling and Interviewing Process

Providing information.—More than a decade elapsed between the Age 22–24 and Age 35 surveys. As such, many CLS participants had to be reminded about the details of the CLS when they were contacted for the Age 35 survey. The partnership with the Chicago Public School (CPS) was helpful in getting participants' attention in the beginning. Trackers were trained to provide information about the CLS to participants, including information about the study's purpose, enrollment process, and findings. Trackers were also trained to explain the purpose and structure of the Age 35 survey to participants, and to provide referrals to the CLS website and other resources as needed.

Scheduling appointments.—Given the length and complexity of the survey, phone interviews were preferred. Many participants had extremely busy schedules, which made it difficult to find time to complete the survey (which required approximately two hours). Thus, trackers and interviewers endeavored to be flexible when scheduling appointments. Many surveys were completed in evenings and on weekends when participants were home from work. The survey could also be completed in multiple sections if needed. When phone surveys were not feasible, staff offered participants the option of completing the survey via mail or online. When a participant requested a hard copy of the survey, project staff mailed it along with detailed instructions and a self-addressed and stamped envelope. Similarly, when a participant requested to complete the survey online, project staff emailed the link along with detailed instructions. CLS staff regularly checked in with participants who were sent physical or electronic copies of the survey to ensure timely completion.

Incarcerated participants.: Since the majority of CLS participants live in Illinois, the CLS Project Director requested support from the Illinois Department of Corrections (IDOC) Research and Planning Unit. The IDOC Research and Planning Unit approved the request to survey incarcerated participants in correctional facilities in Illinois. For participants who were incarcerated out of Illinois, the Incarcerated Participant Coordinator submitted formal requests to correctional facilities that included information about the CLS and Age 35 survey. The CLS team learned that including the study's IRB approval documents with the original request reduced the likelihood of having to receive further approval from each facility, which greatly expedited the scheduling process. After reviewing the request, most facilities requested the standard CLS consent form for inmates to review and sign prior to scheduling an interview. Some facilities required additional documentation or approval from their Department of Corrections IRB. Individual applications for those states were submitted

and after approval was granted, the CLS team was permitted to contact any study participant in that state in the future.

After participant consent was obtained, the tracking team scheduled a time to interview the incarcerated participant by phone. This was often accomplished with the assistance of the participant's caseworker. Due to the sensitivity of the incarcerated population, several staff members received specialized training in issues related to informed consent and conducting the survey with incarcerated participants. This training included reminders about the special ethical issues that apply to research with incarcerated populations. For example, many correctional facilities did not allow compensation of incarcerated participants as a matter of policy. If a participant's correctional facility allowed compensation, the CLS team issued a personal check to the participant, which was typically distributed to the participant's inmate account.

Participant reminders.—When scheduling appointments, trackers asked participants for permission to send a text message or voicemail reminder. If the participant consented, the interviewer called or texted a reminder several hours before the scheduled interview.

Participant control.—The Age 35 survey was time-consuming and included questions about sensitive topics (e.g., mental health, information about participants' children). At the beginning of survey administration, participants received a verbal or written reminder that they could elect to skip any questions that they did not feel comfortable answering and that they would still be fully compensated for their participation. Interviewers were also trained to remind participants of the option to skip questions before sensitive portions of the survey, particularly if the participant seemed hesitant. It was determined that obtaining some data from participants (e.g., a partially completed survey) was better than obtaining no data (e.g., participant declines to participate or drops out in the middle of the survey due to discomfort).

Participant payment.—Most participants received $150 Target gift cards for completing the survey; however, the method of payment was adjusted based on the participant's needs or preferences. For example, some participants preferred to receive Walmart gift cards because there is no Target in their areas. Others requested Visa gift cards (which could be used at a wider variety of stores) or personal checks (which could be used to pay bills).

Soft refusals.—Per ethical standards for human subject research, participants who stated that they did not wish to participate in the survey were removed from the tracking list. However, sometimes it was difficult to discern participants' intentions. For example, many participants hung up when trackers called before the tracker had a chance to explain why he or she was calling. These cases were counted as "soft refusals". Trackers decreased the frequency with which they contacted the participant and proceeded with significant caution.

Missed interviews.—Participants missed scheduled interviews for a variety of reasons, including: (a) forgetting about the scheduled appointment; (b) scheduling conflicts; (c) illness or family emergency; (d) phone line was disconnected; and (e) hesitation or changing

their mind about participating. Trackers were instructed to follow up with participants who had missed scheduled interviews as soon as possible.

Results

To what extent can participants be retained in a 30-year longitudinal study using a multi-pronged approach? The CLS tracking team was formed in April 2015, and the tracking project concluded in July 2017. By the end of the tracking project, a total of 1,105 participants had completed the Age 35 survey. The tracking team facilitated 735 survey completions over a period of 27 months (average 27.22 surveys per month). In comparison, Centers X and Y facilitated 370 survey completions during an earlier period of 32 months (average 11.56 surveys per month) using standard tracking methods. Figure 2 presents the number of survey completions by month and mode. Notably, both Centers X and Y completed a high number of surveys when they first joined the CLS (August 2012 and March 2013, respectively), but substantially slowed down over time.

Recruitment Rates

The baseline sample size of the CLS was 1,539. When the study began in 1985, eight participants had invalid information, making it impossible to track them. By 2017, in addition to these eight participants with insufficient information to track, 87 participants were confirmed to be deceased. Thus, the Age 35 survey response rate is calculated in reference to an available sample size of 1,444 living participants. At the end of the tracking project, we found a validated phone number for 1,184 participants (82%), address for 1,107 participants (76.7%), and email address for 922 participants (63.9%). Moreover, we found validated social media accounts (Facebook or LinkedIn) for 250 participants (17.3%) and had validated alternative (e.g. relatives or friends) contacts for 236 participants (16.3%).

The original CLS cohort consisted of children who attended kindergarten in Chicago Public Schools. Thirty years later, while approximately 68% of participants were still living in Illinois, the remainder had scattered across 40 states. Approximately 18% of participants moved to other Midwestern states, and approximately 10% moved to the South. Notably, many participants who remained in the Chicago metro area still exhibited high residential mobility (e.g., moving between apartments and houses, experiencing periods of homelessness), which complicated tracking efforts. Among 873 participants who completed both the Age 22–24 and Age 35 surveys, only 97 participants (11%) did not move between the Age 22–24 and Age 35 surveys, underscoring a high level of residential mobility.

Table 2 presents the final Age 35 survey status. 1,105 participants (76.5%) completed the survey and 81 participants refused (5.6%). The CLS tracking team found validated contact information for 1,345 participants (93.1%) and probable contact information for 69 participants (4.8%). 57 participants (5.2% of the survey sample) completed the survey while incarcerated.

Table 3 presents participants' demographic characteristics by attrition status. Several significant differences are evident between the Age 35 study sample and the attrition sample. On average, compared to the original CLS study sample, the Age 35 study sample included

more females (54.1% versus 39.7%), had lower family risk status scores by age three (4.4 versus 4.7), were less likely to receive federal financial assistance by age three (60.5% versus 66.6%), were less likely to be borne by adolescent mothers (15.4% versus 20%), and obtained more years of education (12.8 versus 11.8). These results indicate that the attrition sample was likely more disadvantaged than the Age 35 study sample.

Mode of interview completion.—Given the length and complexity of the survey, phone interviews were prioritized. However, participants also had the options of completing the survey via hard copy or online after staff confirmed their identity as a study participant. At the conclusion of the survey ($N = 1{,}105$), 886 participants (80.2%) had completed the survey via phone; 125 participants (11.3%) had completed via an online link; 68 participants (6.2%) had completed via in-person interview; and 26 participants (2.4%) had completed via mail-in survey.

Retention Strategy Effectiveness

Referrals.—We started to offer referral incentives when the tracking project launched in April 2015. We offered 317 individuals (e.g. relatives and spouses) referral incentives for 280 participants if they helped facilitate survey completion (e.g., by passing on information about the survey to the participant). Sometimes multiple people were offered referral incentives for one participant. Among the 317 individuals, 170 individuals were ultimately paid for their help in facilitating 152 completed surveys (54% of the possible referral cases).

Canvassing.—Canvassing started in early July 2015. Canvassers visited 852 different addresses for 433 participants. Canvassers visited an average of 1.97 addresses per participant. Among the 433 participants whose addresses canvassers visited, 236 participants (54.5%) completed the interview, 35 participants (8%) refused, and two participants (0.5%) were learned to be deceased. Among the 236 participants who were visited by canvassers and ultimately completed the survey, 54 (22.8%) completed in-person with a canvasser. The rest completed via phone or mail-in survey.

Reminders and missed interview.—Sending appointment reminders to participants became standard procedure in October 2015 due to a high rate of missed interviews. Among 536 participants who ever scheduled an interview, 293 participants (54.7%) completed the interview as scheduled, and 243 participants (45.3%) missed interviews and had to be followed up with for re-scheduling. We found that participants were less likely to reschedule and complete interviews when follow-up was delayed. Among those who had missed interviews, 188 participants (77.4%) ultimately completed the survey, including five participants who completed the survey over the course of several appointments.

Incarcerated participants.—The tracking team located 75 participants who were incarcerated. 57 of these participants (76%) completed the Age 35 survey. These participants were located in 38 facilities in 10 states. 35 of the 57 participants (61.4%) were incarcerated in 19 facilities across Illinois.

Discussion

The present study demonstrated that it is feasible to locate a high-risk study sample for longitudinal follow-up, even after a lapse of more than ten years. Using a multi-pronged approach, the CLS tracking team facilitated an average of 27.22 survey completions per month over 27 months compared to an average of 11.56 survey completions per month by Centers X and Y over an earlier period of 32 months. Both Centers utilized standard tracking strategies (e.g. searching the CLS database and subscription-based online databases), and contacted participants via calling and mailing.

Resources of time and money are essential to achieve a high participant retention rate. Moreover, a research team needs patience, persistence, passion, and creative teamwork to achieve success. Locating participants using various search tools can be tedious and time-consuming. During the present study, it sometimes took up to six hours to review records and conduct online searches for one participant. Tracking methods (e.g. online search, physical mails, canvassing) were utilized for all participants unless the participant was located and completed the survey when he or she was contacted the first time. Even after obtaining valid contact information, trackers were rarely able to establish contact with participants on the first try. Multiple phone calls, text messages, emails, and other forms of contact were often required in order to connect with a participant and to schedule and complete the survey. Patience, persistence, passion, and creativity enabled the CLS team to overcome these challenges. As such, the Leadership Team carefully built a team of experienced and enthusiastic individuals who could effectively work together. CLS team members frequently assisted each other with making calls, following up with participants, and scheduling and conducting interviews. Most staff were employed on an hourly (versus full-time) basis. Thus, it was especially important for team members to work together and to step in when needed to complete interviews.

In addition to the qualities mentioned above, several recommendations are offered to researchers who are interested in conducting longitudinal follow-ups. These recommendations are based on the expertise we have developed from conducting a tracking operation for over two years. These recommendations are discussed in regards to three issues: (a) planning for longitudinal tracking; (b) locating and contacting participants; and (c) engaging and retaining participants.

Planning for Longitudinal Tracking

We offer several recommendations for other researchers who wish to plan for longitudinal tracking of participants. Most of these recommendations involve minimal financial investment. General strategies mentioned in the literature review are not reiterated here. First, ask for the contact information of a close family member or friend at every follow-up point, and ask participants for their permission to reach out to this individual in the future if the participant himself or herself cannot be located. This strategy is especially useful if it is anticipated that participants may change residences or names (e.g., due to marriage) between study time points. Second, ask participants for their full name (including middle name) and date of birth. This information is frequently required to search for individuals on public databases. Further, having middle names and birth dates can often help to distinguish

between participants with common or similar names. Finally, send participants regular physical mailings (e.g. birthday cards, newsletters, and postcards) to keep in touch with them and to remind them about the study. In the CLS, the gap between the Age 35 survey and the previous survey was 10 years. Many participants did not remember the CLS, and project staff spent a significant amount of time explaining the study. Keeping in regular contact with participants would have helped to maintain relationships and to approach participants for follow-up assessments.

Locating and Contacting Participants

Based on our experience with the CLS, we offer several recommendations for other researchers in regards to locating and contacting participants. As always, these steps should be IRB-approved prior to implementation.

First, create a comprehensive manual that includes study details as well as detailed protocol for tracking, contacting, and interviewing participants. A manual provides standard procedures that can be used to systematically orient new staff. The manual should be updated regularly to reflect changes in the tracking process. Second, make the most of available search tools and keep looking for new search tools. Numerous paid online databases, free internet searches, and web-based telephone directories and search engines are available. Different databases draw information from different sources and may yield unique information. It is important to compare different databases and to evaluate the relative strengths and weaknesses of each database, rather than relying on the results of one database. The CLS team continued exploring and adding new search tools over the course of the tracking effort.

Third, it is important to check incarceration and death databases, such as the National Death Index (NDI), particularly if the study sample is considered to be high-risk for incarceration or early death. Rather than searching for all participants in these databases, it may be more efficient to prioritize searching for participants with known risk factors for early death or incarceration, or for whom no information can be found in any other database. Fourth, it can be advantageous to call and text participants at various business hours, and to try disconnected numbers several times. Disconnected phone lines may be reconnected at a later date, particularly if the study sample is low-income (e.g., after a phone bill has been paid). In our experience, many participants were more responsive to texting than calling – perhaps due in part to the high prevalence of telemarketing and ‘spam’ calls, as well as to the fact that some participants had limited calling minutes on their phone plans.

Fifth, canvassing promising potential addresses can be a valuable strategy for locating participants who cannot be reached by phone, text messages, or mailings. Sixth, sending physical mailings and contacting a participant’s alternative contact person may be useful if attempts to directly contact the participant fail. Finally, many people have social media (e.g. Facebook and LinkedIn) accounts, which were found to be a good way to locate and contact participants.

Notably, while internet resources have increased the ease with which researchers can locate potential participant contact information, our experience suggests that researchers are

unlikely to locate all participants if they solely rely on internet resources. It is important to develop tailored approaches (including multiple database searches, phone calls, texts, collaboration with participants' family and friends, and canvassing) to locate high numbers of participants. Throughout this process, researchers must be careful to always comply with ethical protocol for contacting participants.

Resource considerations.—Depending on available resources, researchers can select the scale and approaches to follow-up that they wish to utilize. Based on our experience during the Age 35 survey and several previous follow-ups, it is generally more expensive to hire research firms to conduct follow-ups than to assemble an in-house team. Members of our tracking team included graduate research assistants (paid at standard University rates) and other hourly staff (hourly rates ranged from $12 to $25 depending on role and qualifications). On-the-ground canvassing, while valuable, is often a more expensive and time-consuming approach. Qualified canvassers must have excellent navigation and communication skills, and may also require gas mileage reimbursement. As such, we recommend only sending canvassers to potential participant addresses when all other contact approaches fail (see Figure 1). Another advantage of conducting follow-ups in-house is that all tracking and interviewing processes can be closely monitored and adjustments can be made in a timely manner.

Engaging and Retaining Participants

We offer several recommendations to other researchers in regards to retaining participants over time. First, it is important to compensate participants for their time (based on IRB-approved study protocol) and to thank them for their participation. During the Age 35 survey, we offered participants a $150 gift card. This represented a major expense, and researchers should determine the amount based on both resources and length of the interview. Second, it is important to be flexible, patient, professional, and culturally sensitive when contacting participants. This suggestion may seem obvious; however, a few participants who began the Age 35 survey discontinued their participation and reported that they did so because of the interviewers' tone (e.g., interviewer spoke in monotone). Finally, it is important to provide flexible scheduling for appointments, particularly if the survey is time-consuming. Many adult participants have unpredictable working schedules, childcare needs, and other factors that may impact their availability.

Engaging incarcerated participants.—The CLS team faced several unique and unexpected challenges when attempting to interview incarcerated participants. There were several instances where incarcerated participants were not permitted to take phone calls, particularly in high-security prisons. In these cases, a hard copy of the survey was mailed to the facility, along with a self-addressed and stamped envelope. Unfortunately, despite these measures, many of these surveys were not returned. Interviewing participants who were incarcerated in county jails also posed unique challenges, including relatively short incarceration periods, relatively lower supervision in the facilities, and many facilities not permitting phone calls. Contacting participants who were detained in other confined environments (e.g., detention centers, supervised living facilities, reentry centers) also

proved to be complicated. These facilities typically had strict privacy policies in place, which restricted the CLS team's ability to accurately identify and contact these participants.

Conclusion

Participant retention is essential to the success of longitudinal studies. High retention rates are required to maintain statistical power, reduce bias, and enhance the generalizability of results. The Chicago Longitudinal Study (CLS) is one of the largest and longest-running studies examining the effects of early childhood intervention on lifelong well-being. Collecting follow-up data with a large sample representative of the original study sample has been critical for advancing knowledge of the longitudinal benefits of early childhood intervention. This paper represents the first time that the study's longitudinal tracking and retention strategies have been described.

During the Age 35 survey, it was both challenging and rewarding to relocate and re-interview participants, most of whom grew up in contexts of urban poverty. The adoption of a detailed, manualized tracking protocol and the utilization of multiple search platforms greatly enhanced the success of the tracking project, as well as the feasibility of continuing the study in the future. Our experience suggests that participant tracking operations are more likely to succeed when they are operated by teams who have vested interests in the research and the quality of the data. In our case, our CLS Project Director emphasized the importance of locating every member of the study sample - each of whom had a unique story to share with us. Finally, it is essential that follow up studies of this size partners with public schools and agencies to access data that aid locating study participants and to disseminate findings for program improvement. We hope that this paper will be useful and motivating to other researchers who are interested in following up with their own participants in the future.

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Highlights

- Multiple search platforms (e.g. social media) are key to locating participants. (81)
- Quickly following up with missed interviews will increase the retention rate. (79)
- On-the-ground canvassing is a useful approach when all other methods have failed. (83)
- It is important to develop tailored approaches to track hard-to-reach participants. (85)
- The team facilitated 735 interviews compared to 370 interviews completed before. (82)

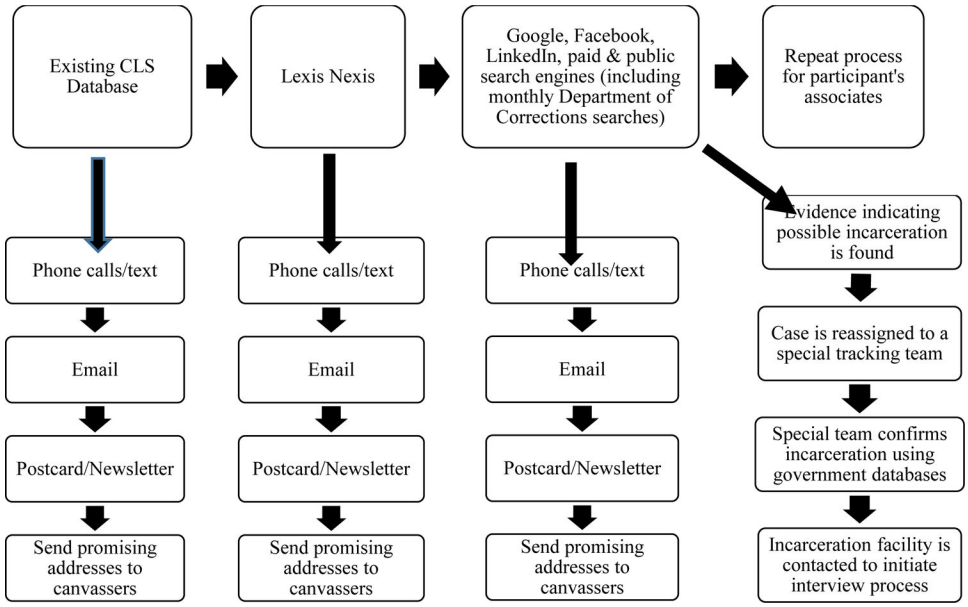

Figure 1.
CLS Tracking Process.

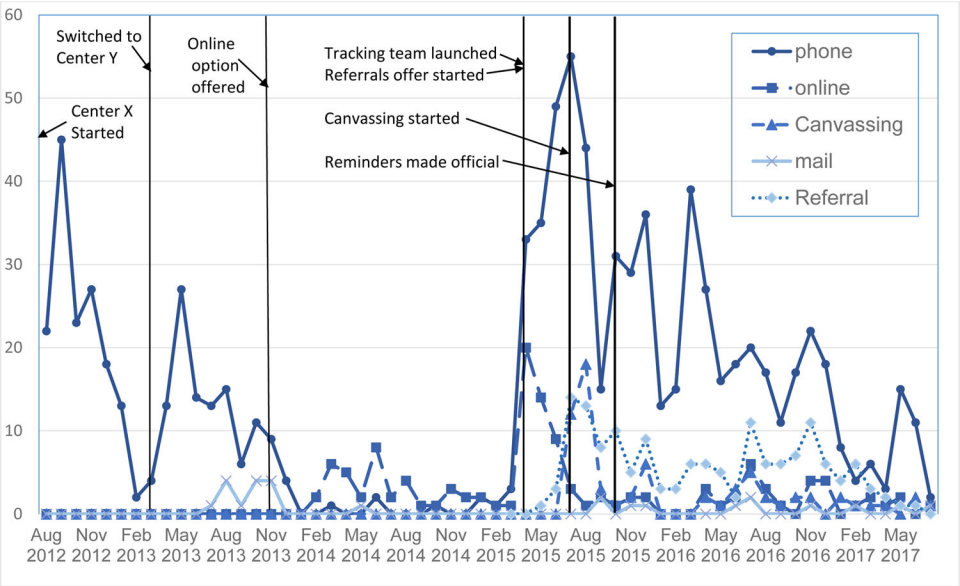

Figure 2.

Number of Completed Interviews by Month and Mode in the CLS Age 35 Survey.

Note. 1. The number of completed interview by referral is a separate category. Referral and mode of completion (phone, canvassing, online and mail) are not mutual exclusive. 2. Five points of time are marked except the start time. The survey project was switched to Center Y in March 2013. Online option started in November 2013. The tracking team launched in April 2015. Referral offer started in April 2015. Canvassing started in early July 2015. Sending reminders were made into the standard protocol in October 2015.

Table 1

Tracking Tools and Social Media Used in the Chicago Longitudinal Study (CLS)

Tracking Tools	Internet address	Information	Fee
Online tracking tools			
LexisNexis	http://www.accurint.com/	DOB, email address, deceased, possible relatives/associates	Paid
TLO	https://www.tlo.com/	DOB, email address, address history, possible relatives, number of indicators (bankruptcies, liens, judgements, utilities)	Paid
US Search	https://www.ussearch.com/	Aliases, email address, address history, possible relatives/associates	Paid
Intelius	https://www.intelius.com/	DOB, email address, address history, owner information, property details, neighbors, possible relatives/ associates	Paid
White Pages Pro	https://pro.whitepages.com/	Email address, address history	Paid
Checkpeople	https://www.checkpeople.com/	DOB, email address, address history, related people, marriage/divorce, criminal history, sex offenders	Paid
Spokeo	https://www.spokeo.com/	Gender, ethnicity, DOB, email address, address history, relatives, marital status	Paid
Beenverified	https://www.beenverified.com	Email address, address history, 1st and 2nd degree relatives, associates, social media (county public records), education, professional, property (overview, county assessor records, deeds, neighbors), criminal and traffic, bankruptcies	Paid
GenealogyBank	https://www.genealogybank.com	DOB, newspapers and archives, recent and historical obituaries, birth records, marriage records, legal, probate & court	Paid
Google	https://www.google.com/	Keyword search	Free
Dogpile	http://www.dogpile.com/	Keyword search	Free
Yahoo	https://www.yahoo.com/	Keyword search	Free
Pipl	https://pipl.com/	Cities and states have been lived, possible relatives/associates, Facebook, google+, Twitter, Amazon customer profile	Free
Zabasearch	http://www.zabasearch.com/	Known locations (city, state, zip) and/or address	Free
Peekyou	https://www.peekyou.com/	Known locations (city, state, zip), possible relatives, part of email address, Twitter, Instagram, Myspace, and images	Free
peoplefinders	https://www.peoplefinders.com/	Cities and states have been lived, possible relatives/associates	Free
411.com	https://www.411.com/	Cities and states have been lived, possible relatives/associates	Free
Crime Tracking tools			
Federal inmate search	https://www.bop.gov/inmateloc/	Name, age, race, sex, register number, location, release date	Free
IL inmate search	https://www2.illinois.gov/idoc	Name, DOB, race, sex, inmate number, location, height, weight, eye color, “marks, scars & tattoos,” admission, release and discharge information, sentencing information	Free
MN inmate search	https://coms.doc.state.mn.us/PublicViewer	DOB, MNDOC offender ID, sentence and release date, caseworker, offense information, court case history	Free

Tracking Tools	Internet address	Information	Fee
WI inmate search	https://appsdoc.wi.gov/lop/	Birth year, race, sex, DOC number, location, height, weight, eye color, hair color, dexterity, court case history	Free
Cook County Jail inmate locator	https://inmatelocator.ccsheriff.org/	Sex, jail information, booking number, booking date, location, court and bond information	Free
Google search	https://www.google.com/	News articles, court records, charges, location	Free
Social Media			
Facebook	https://www.facebook.com/	DOB, hometown, current location, education, experience, possible relatives/associates, mutual friends, and images	Free
LinkedIn	https://www.linkedin.com/	Education, experience, connections, skills and endorsements, interests, and images	Free

Note. DOB=Date of birth; All search tools include information of name, age, phone number and addresses unless noted otherwise.

Table 2.

Final Tracking and Survey Status in the CLS (N = 1539)

				Information status			Incarcerated			
Survey status	**Number**	**%**	**%**	**None**	**Probable**	**Confirmed**	**No**	**%**	**Yes**	**%**
Incomplete[1]	258	17.9%	16.8%	30	69	159	247	17.1%	11	0.7%
Complete[23]	1,105	76.5%	71.8%	-	-	1,105	1,048	72.6%	57	4.0%
Refusal	81	5.6%	5.2%	-	-	81	74	5.1%	7	0.5%
Subtotal	1,444	100%	-	30	69	1,345	1,369	94.8%	75	5.2%
Deceased	87		5.7%							
Insufficient info to track	8		0.5%							
Total	1,539		100%							

Note.

1. Among the participants who did not complete the survey, 15 participants started the survey, and 35 participants scheduled but missed the interview. For those participants who started the survey, they completed less than 30% of the survey, therefore they are included in the incomplete category.

2. Among the participants who completed the survey, 727 participants (65.8%) were in CPC preschool group, and 378 participants (34.2%) were in comparison group compared to the rates of 64.3% vs 35.7% for CPC preschool group and comparison group respectively in the original study sample (N=1539).

3. Among the participants who completed the survey, 886 participants (80.2%) completed via phone, 26 participants (2.4%) completed via mail, 68 participants (6.2%) completed via canvassing (in-person), and 125 participants (11.3%) completed via an online link.

Table 3.

Study Sample Characteristics by Attrition Status in the CLS

Characteristics	N	Original sample (n=1531)	Study sample (n=1,105)	Attrition sample (n=426)
Percent females	1,531	50.1	54.1***	39.7
Percent Black	1,531	92.9	93.5	91.3
Family risk index (0–7) by child's age 3	1,531	4.5	4.4**	4.7
Percent four or more risk factors by child's age 3	1,531	72.8	71.6	75.8
Percent mother not completed high school by child's age 3 [1]	1,475	54.0	52.6	57.5
Percent single parent by child's age 3 [1]	1,482	75.6	74.6	78.2
Percent mother not employed by child's age 3 [1]	1,342	62.9	62.7	63.5
Percent ever reported receiving free lunch by child's age 3 [1]	1,445	82.7	82.0	84.5
Percent ever reported receiving AFDC by child's age 3 [1]	1,440	62.2	60.5*	66.6
Percent having 4 or more children at home by child's age 3 [1]	1,482	17.3	17.5	16.7
Percentage children in school area in which 60% or more of children reside in low-income families	1,531	76.1	75.2	78.4
Percent any child welfare case history by child's age 3 [1]	1,411	4.1	3.7	5.2
Percent mother was teen at child's birth [1]	1,493	16.7	15.4*	20.0
Percent missing on any family risk indicators	1,531	15.8	14.5*	19.2
Percent CPC preschool participation	1,531	64.5	65.8	61.3
Percent CPC school-age participation	1,531	55.5	56.8	52.1
Percent CPC extended participation	1,531	63.1	37.6*	32.2
Percent residing in Midwest	1,444	86.4	88.6**	79.4
Average year of education at age 35	1,398	12.6	12.8***	12.0
Percent ever incarcerated by age 35	1,444	25.1	24.0	28.6

Note.

[1]. Means reported before imputation for missing data.

*Significant at .05 level,

** significant at .01 level.

*** significant at .001 level