

Solving Adaptation to an Aversive in the Treatment of Self-Abuse through an Expanding-Treatment-Sessions Design

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Summary: An adolescent girl's previously intractable and exceptionally harmful knee- and fist-to-head hitting was initially treated successfully with various reward and educational procedures supplemented by contingent skin shock. Subsequently, she adapted to the skin shock. Key features in restoring treatment efficacy appear to be these:

- (1) reducing the treatment to one brief period per day (starting at 5 seconds) during which perfect performance is required, and gradually expanding the length and daily frequency of the treatment periods, day by day;
- (2) giving the student holsters in which to hold her hands, and a footboard with pedals on which to place her feet during the treatment periods.
- (3) requiring only one of the behaviors (knee-to-chin) to be under control at first and only gradually adding the other behavior (hand-to-head) as a treatment target;
- (4) arranging a reward (watching favorite tv program, with decorative bubble trees operating) during treatment period, which was terminated if hands and/or feet were removed from the proper position.
- (5) arranging for the immediate application of a skin shock aversive as soon as the earliest possible antecedent occurred (staff were aided by automated alerting equipment);

The treatment arrangement was so effective that her problem behaviors were reduced to levels far lower than were observed following the initial introduction of the GED or GED-4 treatment. The effect remains intact after more than 2 years of treatment.

Introduction

Adaptation is a phenomenon where a stimulus loses efficacy as a decelerator as a function of repeated presentations. When adaptation is observed, the usual options involve providing a treatment holiday in which the aversive is not used for substantial period of time, or continuing to apply treatment but changing some

aspect of the procedure that is used—e.g. increasing the strength of the aversive, and/or decreasing the number of behaviors being treated. Treatment holidays in such cases usually require using restraints to keep the behavior from occurring. Increasing the strength of an aversive is not always a treatment option and decreasing the number of treated behaviors can have deleterious effects on the individual receiving treatment.

Another option, successfully used in this case, involves reducing the treatment period to a very small period each day and gradually expanding that period until it encompasses the entire day. Limiting the treatment period makes it easy to have consistent staffing during the treatment and makes it easy for the clinician to make changes quickly.

Method

Participant

Samantha, a 16 year old adolescent female has been diagnosed with autism and severe mental retardation. Previous to enrolling in JRC, she received early ABA intervention training and subsequently entered a specialized day program. At the day program, her self-injurious behaviors of hitting and slapping her head began to accelerate. Attempts to interrupt her self-injury resulted in various aggressive behaviors. Consequently, she was placed in a residential treatment setting. There, a series of behavioral interventions were attempted based on a functional analysis. None of these interventions were effective and her head hitting continued at a rate of around 100 per hour. In addition, she was treated with Risperdal, Benadryl, Abilify, Seroquel, Depakote, and Prozac, but these, also, were ineffective. As a result, she detached both of retinas, losing her vision. She needed surgery to restore vision, but this was impractical too because of her continuing self-abusive behaviors. Her problem behaviors were so frequent and intense that they completely dominated her life and made the acquisition of new skills nearly impossible.

1. Treatment with GED all day (22 weeks)

Samantha was admitted to JRC in March 7, 2005. Initially, she wore arm splints to prevent her from damaging her eyes. Eye surgeries were needed to correct the damage she had inflicted prior to her admission to JRC. One surgery took place 5 weeks after she was admitted to JRC. A second surgery took place six weeks later. Given the intensity, dangerousness, and refractory nature of her problem behavior, a 15 mA skin-shock, delivered by the Graduated Electronic Decelerator (GED), combined with a variety of differential reinforcement and educational procedures began 11 weeks after admission.

2. Treatment with GED-4 all day (91 weeks)

Because of Samantha's apparent adaptation to the initial shock stimulus that was used, a stronger 41 mA stimulus produced by JRC's GED-4, was substituted during the next 91 weeks. During this period there were two weeks during which treatment was suspended because the participant contracted shingles.

3. GED-4 holiday, arm splints applied throughout the day (7 weeks)

During this period, the GED-4 was not used and arm splints were applied throughout the day to prevent head hitting. Other mechanical restraint procedures were used as necessary to address behaviors that were dangerous to Samantha or others. We also continued to adjust various aspects of her reinforcement and educational program to minimize problem behaviors.

4. Treatment with GED-4 only during treatment sessions of progressively increasing duration; arm splints at other times (33 weeks)

Samantha's health dangerous behaviors were addressed with the GED-4 in sessions. Sessions took place in a room designed for the participant containing a couch (for use as a reward), two standing plastic palm tree lamps filled with water that bubbled (another reward), and a TV/DVD player containing her favorite video (see Figure 1). The first session was 5 seconds in length and there was only one session on that day. Gradually the frequency and durations of the sessions increased to a point where the aggregate amount of session time was 2-3 hours.

The two most frequent and dangerous topographies exhibited by Samantha were striking her head with her hand and striking it with her knee. We endeavored to consequence the earliest stage of each of these problem behaviors in order maximize effectiveness. To do this, hand holsters (see Figure 2) and a footboard (see Figure 3) were created. When the participant's hands were inserted into the holsters and her feet were positioned upon the footboard, her video and palm trees (both reinforcers) automatically operated. In addition, a set of green lights signaled to the participant that her hands and feet were situated properly. If her hands or feet were removed from the holsters or footboard, automatic controls turned the green lights to red, turned off the TV and bubble tree lights, and caused a buzzer to sound. As soon as these occurred, a staff member administered the GED-4 skin shock consequence.

5. Treatment with GED-4 skin shock during treatment sessions that involve walking around building and working at tasks.

After the participant had been able to do an aggregate of two hours in daily sessions without displaying any problem behaviors, we programmed for generalization. Samantha began to do her sessions while walking around the school, entering various classrooms or reward areas, and when inside various residences. While doing these activities, she was directed, at first, to keep her hands in the holsters. When she could do this successfully and consistently, she was allowed to take her hands out of the holsters. If she could that successfully and consistently, she was instructed to do some tasks that required her to use her hands.

6. Treatment with GED-4 all day (treatment sessions discontinued).

The regularly planned treatment sessions were now discontinued. The GED-4 consequence was now used throughout the day, just as was the case in phase 2 above. A new contingency was created where, contingent upon identified problem behaviors (including aggression), one GED-4 consequence was arranged and the participant was required to complete one 10 minute practice session. This procedure remains in effect.

Results

The results are summarized in Figure 4. Figure 4 shows the monthly frequency of Samantha's health dangerous behaviors. Although the GED was initially effective, it lost effectiveness over time. When the GED-4 was introduced, it was effective at first; however, adaptation to it also occurred. When sessions-based treatment was introduced, the total frequency of health dangerous behaviors was high at first, but almost all of those occurrences were recorded outside of the sessions—very few occurred during the sessions. When session-based treatment was ended, and the GED-4 was used during the entire day, the behavior showed a very satisfactory decrease to near zero, a level which continues to this day (25 months after the session based treatment was ended).

The deceleration of the health-dangerous behaviors had a very salutary effect on other behaviors that were not initially treated with the GED-4 within the sessions—notably, aggression (see Figure 5). We did not address aggressive behaviors with the GED-4 during sessions. However, when phase 6 began, the GED-4 and session completion was made contingent upon aggressive behaviors. On the 11th day of phase 6, Samantha exhibited one aggressive behavior and has not exhibited aggressions since.

Figure 6 shows the total number of applications of the GED-4 stimulus that were required. Since the start of the session-based treatment, Samantha has

received a total of only 183 applications. Figure 7 shows a photo of Samantha upon admission and a recent photo.

Discussion

There are two general approaches to instituting a treatment program to reduce problem behaviors. One approach (“whole day”) is to apply a treatment regime throughout the day, and consequence every inappropriate behavior that occurs during the day. When this is done, one may find that some level of occurrences of the problem behavior continues after the behavior starts being consequence with the aversive. In such cases one hopes that that frequency will decrease over time in response to the aversive. An alternative approach (“expanding treatment sessions”) is to choose a very small period of time, seek to reduce the behavior completely to a zero level during that small period, and then gradually expand that period until it occupies the full day, while trying to keep the behavior at a zero level.

In this study, we started with the first approach, but found that the student adapted to the aversive being used. Then we used the second approach to solve the problem.

The procedure was remarkably effective and the effects have proven to be exceptionally durable (the frequencies have remained at near zero levels for over two years). Samantha’s non-compliance and aggression—neither of which were being treated with the skin shock during the treatment sessions—were reduced to near-zero levels also as a result of procedure. Thanks to the success of the procedure, Samantha was able to complete toilet training, improve her communication, discontinue mechanical restraint, and visit her family at home. Anecdotally, the reduction of her problem behaviors resulted in improvements in her sleep, food intake, weight and mood.

It is possible that the expanding-treatment-sessions approach makes it easier for the student to obtain control over her self-abusive behavior by making the task of controlling that behavior relatively easy at first (by limiting the length of the treatment period), ensuring that that exercise of control was well rewarded, and then making the task more difficult only gradually. With higher functioning individuals, a similar thing is done when a behavioral (DRO) contract is made for a very short period of time at first and then gradually expanded as the student shows that he/she can pass the shorter contracts. With severe self-abusive students, it may be difficult to use DRO contracts because of the lack of rule-governed behavior

that the student possesses. The expanding-treatment-period procedure, however, provides the lower functioning student a similar opportunity to gradually expand his/her self-control. Samantha is the second out of four different students with whom we have used this training procedure. The procedure has proven successful in all four cases to date.

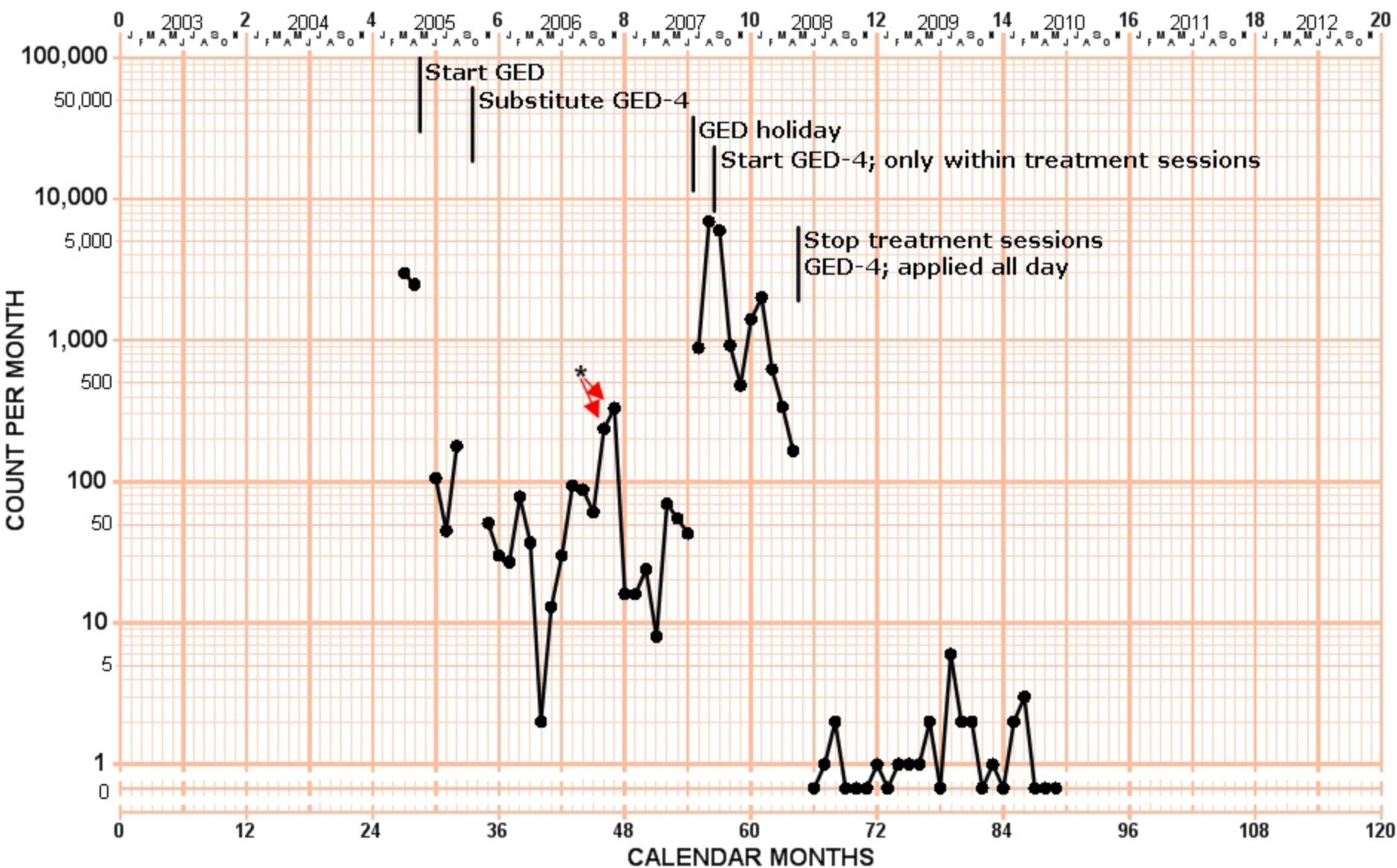








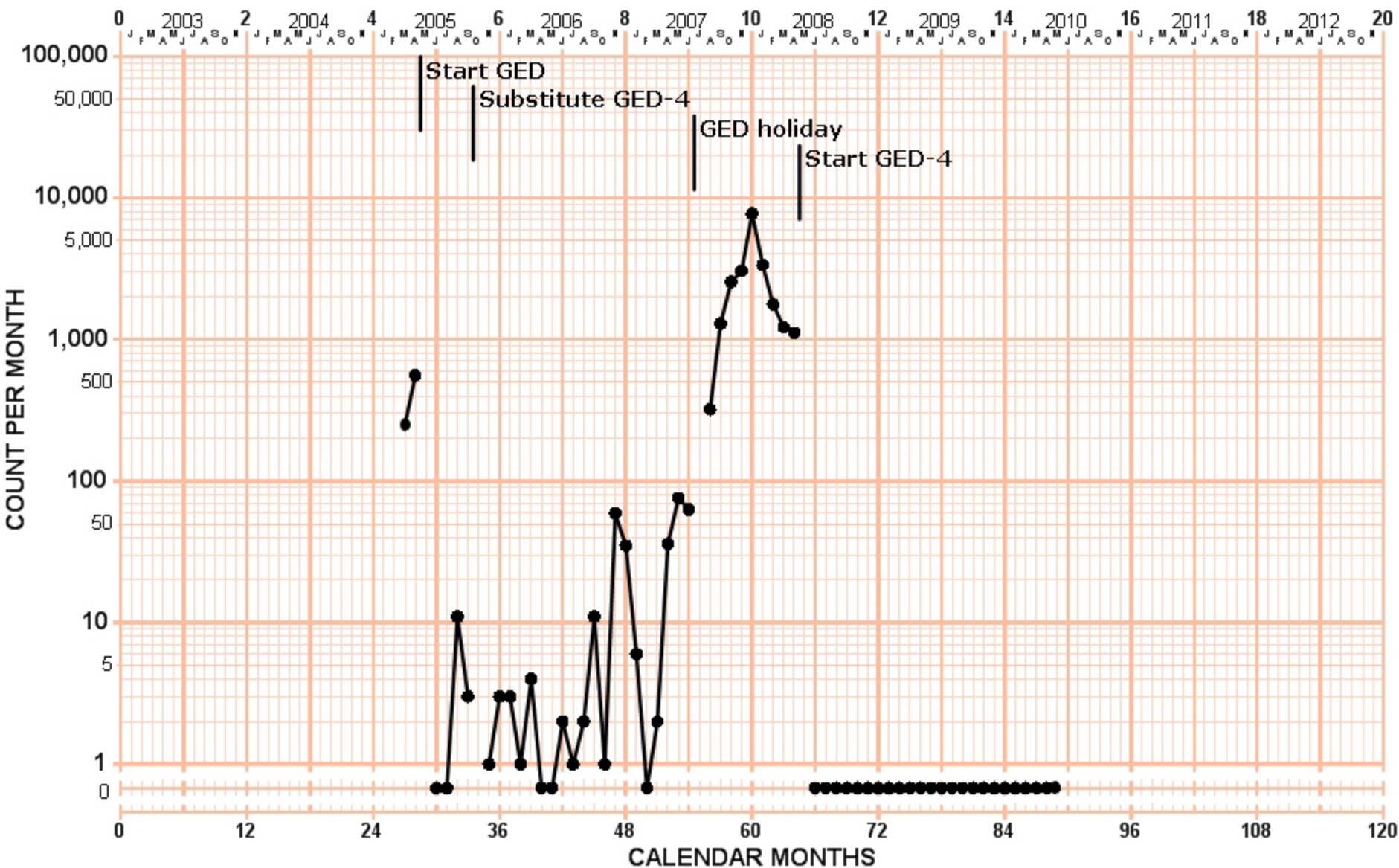
MONTHLY CHART



* At the end of October and the beginning of November, GED-4 treatment was suspended temporarily as Samantha contracted a case of the shingles

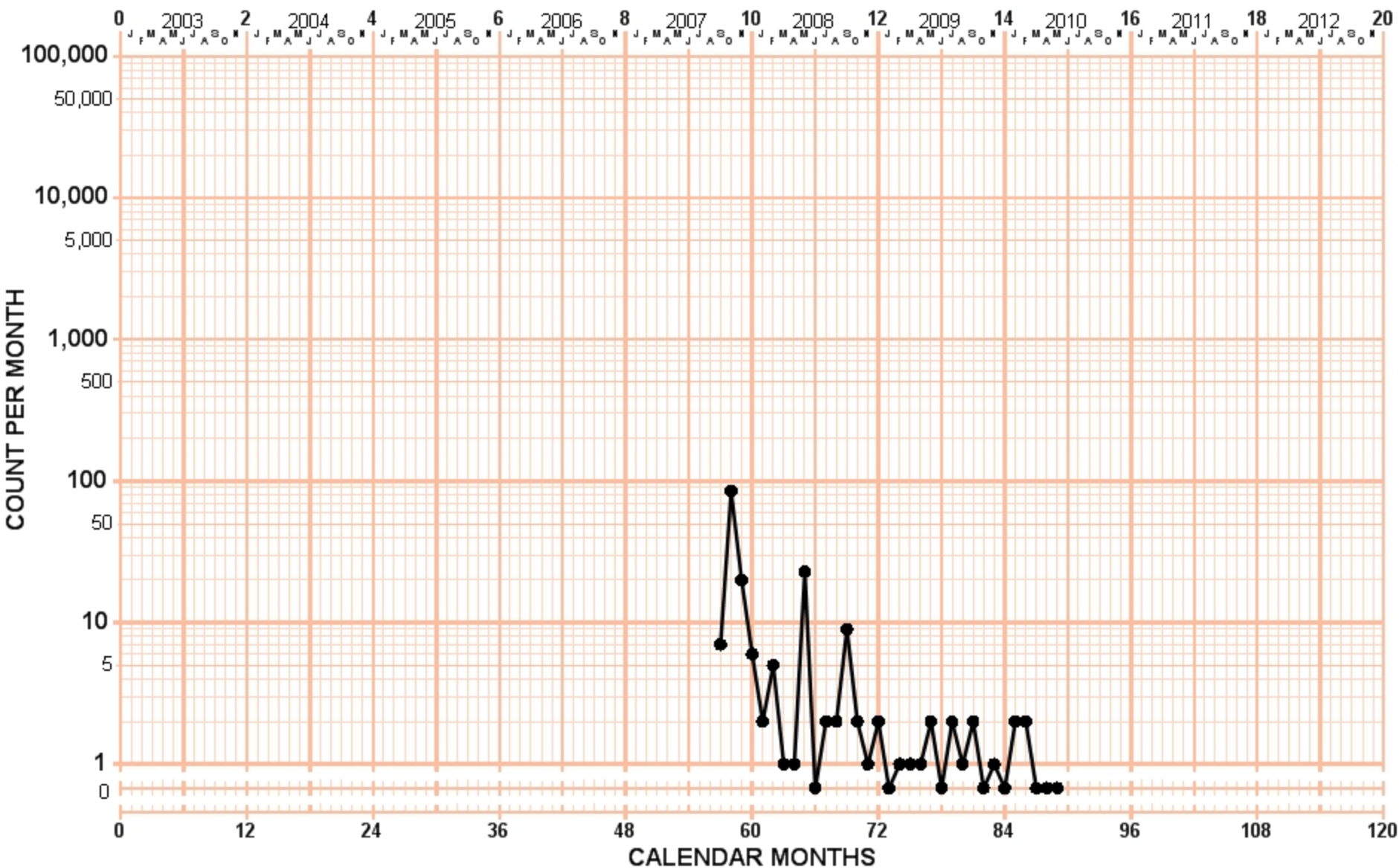
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