

RESEARCH ARTICLE

**An Ethnographical Assessment of Project Firefly:
A Yearlong Endeavor to Create Wealth
by Predicting FOREX Currency Moves
with Associative Remote Viewing**

DEBRA LYNNE KATZ

IGOR GRGIĆ

T. W. FENDLEY

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Abstract—More than 60 remote viewers contributed 177 intuitive-based associative remote viewing (ARV) predictions over a 14-month period. These viewers comprised pre-established, self-organized groups cooperating under the rubric of “Project Firefly” (PFF), and were supervised by experienced ARV group managers operating under the umbrella of the Applied Precognition Project (APP), a for-profit organization exploring precognition and leveraging ARV methodology as an investment enhancement tool. Based on predictions from the ARV sessions, PFF used the Kelly wagering strategy to guide trading on the Foreign Exchange (FOREX) currency market. Viewers performed under typical scientific protocols, including double-blind conditions, appropriate randomization, etc., using a variety of ARV application methodologies. Investors, many of whom were also participants (viewers and judges), pooled investment funds totaling \$56,300 with the stated goal of “creating wealth aggressively.” Rather than meeting that goal, however, most of the funds were lost over the course of the project. Beyond merely reporting on an extensive remote viewing experiment, the present study is an examination of what went wrong, providing lessons learned for further ARV research whether involving for-profit activities or basic research, as the principles are relevant to both. Associative remote viewing is a research paradigm that harkens back to early days in science where competent non-academic researchers can provide datapoints and breakthroughs in a field typically peopled solely by professional researchers. Adapting a form of ethnographic study, we refer not only to the statistical results produced by the PFF effort, but also employ a mixed-methods qualitative approach to exploit the information and insights contributed by numerous participants about what happened, what worked, and what didn’t. This creates a reference we believe will be useful for those conducting future applied precognition projects involving multiple participants or groups. We feel that the insights gleaned from this study will improve both

ARV experimental design and execution of research protocol, benefitting professional and amateur researchers alike in their future ARV experimentation.

Keywords: associative remote viewing—remote viewing—precognition—Kelly wagering—FOREX—Applied Precognition Project—intuitive wagering—controlled remote viewing—parapsychology—predicting the future—sociology of science—ethnography of parapsychology research—non-academic contributions to science

Background

In 1972, researchers at the Stanford Research Institute (SRI) began to explore the intuitive abilities of psychics and non-psychics through numerous experiments requiring detailed descriptions of photographs, objects, and locations perceived at a distance. This process was referred to as “remote viewing” (Puthoff & Targ 1976). By the late 1970s, SRI experiments had demonstrated that remote viewing could be reasonably and consistently successful and repeatable, thus earning them a series of contracts to serve as the research arm of the U.S. military “psychic spying” programs that spanned two decades (Smith 2005).

Associative remote viewing (ARV) is a specific application of remote viewing developed by Stephan A. Schwartz and SRI researchers in the early 1970s. It is used to make predictions about future events. Schwartz first presented the concept in August 1977 at the Philosophical Research Society Conference on Extraordinary Human Functioning (Schwartz 1977).

Essentially, the ARV process serves to overcome the inherent problems of forced-choice, repetitive tasks by pairing limited choices with unlimited options. While ARV protocols and purposes vary, viewers use intuitive processes to correctly describe and produce sketches and verbal reports of a photo, video clip, or other pictorial or sensory data that is paired with a potential future outcome. For ARV with photo targets (the most common), viewers describe the associated image they will see in the future, rather than directly describing the outcome or event itself. This enables viewers to remain blind to the subject matter they will describe (which could be one of millions of potential images), even if they have foreknowledge of the event and its limited number of possible outcomes.

Depending on a project’s goals, successful ARV predictions may result in financial gain, may demonstrate evidence of psi and precognition, and/or may assist those seeking information about the future, such as predicting which candidate will win the upcoming presidential election (Katz & Bulgatz 2017).

Beginning in 1985, Dr. Edwin May served as director of SRI and the SRI-Consciousness Laboratory (SRI-C), which was considered the research

arm of the U.S. military remote viewing programs. He advised the authors that the military programs used ARV as one of their information-gathering and decision-making tools. He wrote, “instead of remote viewing yes/no questions with its low effect sizes, we could get the answers using free response in an ARV protocol” (May 2016).

In 1982, Keith Harary and Russell Targ used ARV to forecast changes in closing prices of the silver futures market. They made 9 consecutive correct forecasts, which yielded earnings of more than \$100,000 (Harary & Targ 1985). Harary and Targ repeated the experiment the following year but were unsuccessful on all 9 trials. Some speculated that shortening the time interval between trials, which resulted in viewers having to perform a subsequent trial before receiving feedback for the preceding one, may have impaired performance (Targ 2012, Houck 1986).

Also in 1982, Dr. Harold E. Puthoff used ARV to predict the daily outcome of the silver futures contract for 30 consecutive days. Seven remote viewers conducted from 12 to 36 trials per person over the entire series. Each day, predictions were made using consensus judging. Twenty-one of the 30 trades were profitable, yielding profits of \$250,000 (Puthoff 1984).

In 1994, Russell Targ, Jane Kutra, Dean Brown, and Wenden Wiegand conducted yet another ARV experiment in which remote viewers had time to receive feedback before starting another trial. In this 9-week series, objects were associated with the two possible outcomes, “Up” or “Down,” of the weekly silver futures contract. A judge used an error-detecting protocol to compare the remote viewers’ descriptions to the targets and to rate the accuracy of the description on a scale of 0 to 7. If the trial scored a 4 or higher, a prediction was made. Results yielded 2 passes and 7 trades. This was a simulation, so no purchases were made, and capital was not risked on the predictions. Six of the 7 trade predictions were correct (Targ et al. 1995).

In 2000, Marty Rosenblatt, operating under Physics-Intuition-Applications (P-I-A), reported results of an ARV experiment referred to as “the AVM project” that predicted stock market closing points. As reported on the P-I-A website and confirmed in subsequent interviews with participants, 7 viewers were paid to do 500 sessions each, for a total of 3,500 predictions, which were funneled into 700 investment targets. The “Up,” “Down,” and “Near-Neutral” stock changes were randomly associated with the “Animal,” “Vegetable,” or “Mineral” nature of 5 AVM photo targets. According to Rosenblatt’s report, their overall performance was

just about what you would expect based on chance. There were 2 instances where the group produced a very high ‘prediction cluster,’ at the 99.4 percentile based on chance, and both of these predictions were successes. Also, 2 viewers achieved the 99.8 percentile in their first 100 predictions during their dry-run period . . . (Rosenblatt 2000)

From May 1998 to September 2011, Greg Kolodziejzyk conducted a 13-year study using a unique computer-based approach to the ARV protocol that allowed a single operator (himself) to conduct 5,677 trials. Of these, 52.65% correctly predicted the outcome of their respective future events, yielding a statistically significant score of $z = 4.0$. These 5,677 trials addressed 285 project questions intended to predict the outcome of a given futures market. (Multiple ARV trials answered a single question.) Of these project questions, 60.3% were answered correctly, resulting in a statistically significant $z = 3.49$. One hundred eighty-one project questions resulted in actual futures trades where capital was risked. Of those, 60% of the trades were profitable, yielding a profit of \$146,587.30 (Kolodziejzyk 2015). Kolodziejzyk reported that he went for quantity, rather than quality, in his remote viewing sessions. He also attributed his success to combining his knowledge of the stock market and the use of logic with the intuitive practice of ARV (Kolodziejzyk 2015).

In 2012, two University of Colorado college students (C. Smith and D. Laham) and Professor G. Moddel successfully conducted an experiment with 10 inexperienced remote viewers, using ARV to predict the outcome of the Dow Jones Industrial Average (DJIA). One of the project's unique aspects was that participants conducted their viewing sessions together in the same room, as compared with by themselves or in the presence of a single interviewer, as ARV experiments are usually done. They also used a very simple rating system. Instead of assigning transcripts a score, they just decided which of the two photo options best matched each viewer's sessions. In aggregate, the participants described the correct images, successfully predicting the outcome of the DJIA in 7 of 7 attempts (binomial probability test, $p < .01$). An initial investment of \$10,000 yielded a gain of about \$16,000, with a total of \$26,000 at the end of Trial 5 (Smith, Laham, & Moddel 2014).

From August 2014 to August 2015, Mark Samuelson attempted to replicate Smith, Laham, and Moddel's project (Samuelson 2016). An experienced remote viewer and project manager without a formal research background, Samuelson served as project manager and independent judge. He recruited fellow members of the Applied Precognition Project as remote viewers. They met online in a webinar format a couple of times each month rather than in person. As in the University of Colorado project, group predictions were rated using a simple judging method. Samuelson's group predicted professional sporting events rather than stock market fluctuations. The goal of exceeding their 65% hit rate also differed from the University of Colorado group's goal of making money. After 26 trials, the group had 13 hits, 7 misses, 4 passes, and 2 pushes—maintaining, but not exceeding, their 65% accuracy rate.

In a paper presented at the 2013 Parapsychological Association convention in Viterbo, Italy, Dick Bierman attempted to complete the first-known meta-study of ARV experiments. He summarized,

A review of ARV experiments yielding about 17 experiments for which trustworthy data could be obtained, suggests that the mean scoring rate in a binary situation is around 63%. If these results could be confirmed, this would falsify theories that predict that it is impossible to use psi in a consistent and robust way and moreover it could be the end of the financial problems in the field of psi research. (Bierman 2013)

In this same paper, Bierman also introduced a series of automated ARV-casino experiments using computer-assisted scoring and data collection. In summary, he stated:

Simulations of a 32-trial ARV experiment with a roulette outcome determining the target suggest that, for viewers that perform with an effect size of around 0.35 and players using a simple betting strategy, there would be an average net result of about 10 times the starting capital. (Bierman 2013)

Project Firefly

In October 2014, the Applied Precognition Project (APP) began Project Firefly (PFF), a yearlong effort to predict FOREX currency moves with ARV. APP serves as an umbrella for a variety of self-organized groups, which contribute predictions to an overall predictions list. According to the mission statement on its website, the APP's mission is "to publicly explore, research, and apply logic and intuition/emotion to predict future event outcomes, enabling participants to evolve personally while contributing to the elevation of global consciousness."

EXAMPLE 1: Applied Precognition Project. Long-time ARV enthusiast and former nuclear physicist Marty Rosenblatt founded APP in 2013, along with Tom Atwater and Chris Georges (since resigned). Prior to APP's creation, Rosenblatt operated P-I-A. APP serves as an umbrella for a variety of self-organized groups, which contribute predictions to an overall predictions list. APP groups are created by and overseen by volunteers who act as independent managers. They determine their own methodologies, recruit viewers, and choose which events to predict. Since APP's inception, Rosenblatt has overseen operations, kept data, managed active discussion lists, and planned yearly conferences, where he presents the overall group statistics. APP groups have primarily operated and communicated with each other via electronic technologies such as private, individual, or group emails, discussion email lists, and webinars. Some groups, such as the Winning Entanglements (WE) groups, use a web-based software program Rosenblatt designed. WE members receive target numbers and tasking from their group manager, then can do self-judging and input their own predictions.

TABLE 1
ARV Hit Rate Summary from June 2013 to June 2014 (Prior to PFF)
Hit Rate = 62.4%, P-onetail = .000509, Znormal = 3.3; Odds vs. Chance = 1964-1

Group	Protocol	Hit Rate (%)	Hits	Misses	Passes
WebinarWorkshops	WE	100.0%	4	0	1
CAS-OAK A	CAS	100.0%	4	0	16
Vampires	1ARV	100.0%	1	0	1
PASR	PASR	80.0%	8	2	0
Solo	Binary	71.2%	52	21	30
Sublime	Binary	69.2%	9	4	7
Omega	WE	60.0%	6	4	7
Pegasus	WE	58.3%	7	5	9
WWCdinner	WE	58.3%	7	5	4
Financial	WE	53.8%	7	6	6
Croatorium	CAS	50.0%	1	1	6
Sage	WE	42.9%	3	4	13
First Groove	WE	27.3%	3	8	7
Poised	WE	14.3%	1	6	3
CAS-OAK C	CAS	0.0%	0	2	6
Totals		62.4%	113	68	116

Data shown by M. Rosenblatt at June 2014 APP conference in Henderson, Nevada.

Project Firefly used the Kelly wagering method to determine trade size—a probability-based system relying on a mathematical edge tied to past performance, used most often in sports betting with binary outcomes (Kelly 1956). The plan also implemented a majority vote (MV) procedure on every prediction made. For PFF to be successful, the Kelly wagering method required performance significantly above the 50% random rate. According to the “Assets Growth Simulation” APP completed prior to the project, the break-even point was a 55% hit rate. Before PFF began, APP founder Marty Rosenblatt had reported APP hit rates of 62% between June 2013 and June 2014 (Table 1).

Instead of holding steady or rising, however, Firefly’s hit rate plunged to 48%. In December 2015, the project halted 14 months after it began with 177 predictions completed (Table 2), of which 152 were executed as

TABLE 2
Firefly: 177 Daily Aggregate Predictions Oct. 20, 2014, to Dec. 18, 2015

Hits	Misses	Passes	Hit Rate
85	92	72	48.0%

trades. Of these 152 trades, only 72 (47.4%) were successful (Table 3). Only \$4,114 remained of the \$56,300 invested by 62 members.

TABLE 3
Firefly: 152 Actual Trades Taken on Daily Aggregate Predictions
October 20, 2014, to December 18, 2015

Hit	Miss	Pass	Hit Rate
72	80	97	47.4%

Following, the overall approach the authors used to report on the project and its scope are described. This includes a description of how PFF predictions were made and a discussion of what worked and what went wrong, with an emphasis on adjusting protocols for future projects.

Documenting Project Firefly: A Mixed-Methods Qualitative Approach

At Firefly's completion, the managers made it clear they did not intend to do a formal writeup of the results, other than reporting to investors, stating it was an investment club and not a formal scientific research project. The authors and many contributors to this paper—all of whom participated in Project Firefly in various roles—felt otherwise.

There is scientific value in examining not just the actual numerical results, but also the lessons learned for the sociology of science in this 14-month project. Although not its expressed purpose, Firefly had all the underpinnings of an exploratory scientific experiment, in which there were repeated, blind trials conducted by experienced project managers, who replicated aspects of prior formal experiments. A project of this magnitude, carried out in a diligent manner on par with other exploratory research-based projects, should not merely disappear into the fog of history.

In search of an effective model, we, as a self-appointed “insiders” team, opted for a mixed-methods, qualitative-based approach, borrowed from the field of anthropology, known as “ethnography”—the study of

social interactions, behaviors, and perceptions that occur within groups, organizations, and communities (Reeves, Kuper, & Hodges 2008). Whenever possible, direct quotes and data taken from written interviews, emails, presentations, documents, surveys, promotional materials, datasheets, etc., are provided. All contributors were given the opportunity to review earlier drafts of this paper and to provide input.

Metagroup Method: Project Firefly Begins

Carlos Mena, a Brazilian businessman and long-time remote viewing enthusiast, conceived Project Firefly. Together, he and Rosenblatt invited all APP members to attend an introductory webinar held in August 2014. Mena's PowerPoint slides summarized the proposed project: "Firefly is not a new group, it is a metagroup. That is, a group of groups. . . . It is aimed at creating wealth aggressively." The plan established a majority vote (MV) procedure for every prediction made by the private investment club.

Trading would take place on the Foreign Exchange market (FOREX) via Interactive Brokers, an online broker and trading platform. Although sports betting tended to be more popular within APP than financials, Project Firefly would use FOREX because—unlike sports betting—its legality in the United States is unquestioned. Also, FOREX has no limits on how many trades can be placed or when they can be placed.

Traders would define each Firefly trade prediction as an event with a binary outcome. Based on this, Firefly entities would use an ARV protocol to predict if a particular FOREX currency pair would move either "Up" or "Down" for a specific and predefined number of "pips," based on a predefined trade entry time. A pip is the smallest price move that an exchange rate makes for a given currency pair.

At the heart of the new project was the Kelly wagering method. This method is dependent on previous statistics, as it integrates an already established baseline into a formula to determine the optimal size of the wagers (Kelly 1956). APP had already demonstrated it could achieve a long-term hit rate of 62%, even with some groups performing at chance or even lower.

Encouraged by this high hit rate, Mena proposed an aggressive wagering strategy:

We will be betting 20% of total assets in each trial in order to maximize our growth rate. If we reach a 60% total hit rate after 240 trials, we should expect \$125,527 on our Excel sheet for each \$1,000 invested . . . if we manage to improve on our base hit rate and reach 65%, we may expect around \$16,000,000 on our Excel sheet for each \$1,000 invested after 240 trials.

The slides that followed included a disclaimer that “of course, the project could fail.”

Under the proposed plan, all APP groups and all remote viewers were considered as equal contributors. Since no one was excluded, the project had plenty of viewers and groups providing predictions. While it would require considerable coordination and communication between group managers and Firefly Traders, the groups all maintained independence to set their own procedures related to photo selection, judging, rating, participants, and issuing of predictions (Appendix A and Appendix B describe the methodologies used).

To achieve the proposed 240 trades, each group had to contribute only one session a week. The Firefly trading team assigned each group manager a weekly event and date with a specified deadline for returning the prediction, which would then be entered into a shared predictions spreadsheet. Prior to the initiation of Project Firefly, many of APP’s group managers were already submitting predictions to a shared “predictions list” that all paid APP members in good standing could make use of however they wanted. Now the difference would be that the Firefly Traders would use the predictions to place trades with money from investors. Each investor was required to participate in at least one group as a remote viewer.

Planning and Implementation

APP members and their personal contacts signed up as investors for Phase One between early August 2014 when the plan was introduced and early October 2014. Potential investors were counseled to contribute only monies they could afford to lose. The minimum investment amount was \$100. Shares were based on \$100 increments (e.g., a \$100 investment was one unit of the total, for purposes of profit disbursement). Participants could not withdraw funds after the main phase began until the yearlong project was complete. Table 4 describes the number of investors and monies collected for each phase of the project.

APP co-founder Chris Georges set up the project as a legal financial business entity, according to U.S. tax law, and controls were established to ensure that no single person had access to the funds. Those placing trades via the FOREX system had authority to move money around within the system, but could not make withdrawals. As an additional safeguard, two Traders were to be involved in making every trade.

Only a few APP members understood how to place online trades in FOREX. Those who had the skill and time to devote to the project as unpaid volunteers—Mena, Rosenblatt, and another APP group manager,

TABLE 4
Financial Summary from Firefly Administrative Officer Chris Georges

	Phase 1	Phase 2	Total	Largest	Smallest	Average
Members	54	62	62			
Collected	\$43,200	\$18,000*	\$61,200			
Invested	\$38,500	\$17,800	\$56,300			
Retained			\$4,114			
Investment amounts				\$10,000	\$100	\$987

* Includes funds from 8 new investors and additional funds from Phase One members

Igor Grgić—comprised the Firefly trading team. Jon Knowles, a less-experienced Trader, stood in for Rosenblatt when he went on vacation at the start of Phase Two. Knowles also served as a consultant for the trading team.

Some Firefly members expressed concern about the proposed management structure, citing the need for an independent Oversight Committee that excluded members of the trading team. Also, no procedures were in place in the event of early losses. Not all APP members felt it was prudent to use under-performing viewers and groups, but that also remained an integral part of Firefly’s initial design.

The *Firefly Investors Manual* was emailed to the APP Discussion Group on October 7, 2014, two weeks prior to the start of Phase One and after most of the investors had made their financial contributions. The manual made no mention of what would happen if early losses occurred. It listed Oversight Committee members as Georges and trading team members Mena, Rosenblatt [Committee chairperson], and Knowles.

The manual gave the Oversight Committee power to adjust protocols as needed:

At any point in time, Firefly may make adjustments for accepting predictions in order to strengthen our predictive capabilities. If made at all, these adjustments will be based on data gathered as the project advances and will be made by the Committee.

Per the manual, Traders were responsible for acting on each prediction, executing the trade in the market of choice, and following rules detailed internally for accepting the trade. An online document titled *Firefly Tasking and Predictions* tracked each trade decision. Traders were notified by SMS

message via the Interactive Brokers platform for each executed trade (no matter who executed it). Before each Run, if existing rules or protocol changed, then the new rules were implemented.

Methodology

Overview of the ARV Process

As noted earlier, Firefly Traders executed FOREX trades based on predictions of whether the price would go up or down. The Trader for each trial would assign the event to one or more group managers who had previously indicated their group's availability to submit a prediction.

Each group manager handled all other aspects of the trial, which started with compiling a set of photos, one of which was designated for the "Up" outcome and the other for the "Down" outcome. The group manager assigned a target reference number (TRN), which represented the photo associated with the future winning outcome. The manager emailed the TRN to the group's remote viewer(s), along with "tasking" instructions. The tasking invited the remote viewers to use their intuitive abilities to tune into the feedback photo designated for the winning outcome, which they would receive after the trade was completed. During the remote viewing session, the viewer(s) recorded all intuitive impressions via words and sketches onto blank paper; afterward, they emailed this "transcript" to their manager.

Next came analysis and judging. Each group determined whether to use independent or self-judging, as well as what judging methodology to use. Some groups used a 7-point scale, some a 3-point scale, and others simply chose the best match. In each case, the remote viewer's transcript was compared to the two photos. Ideally, the transcript(s) would be a strong match for only one photo and a weak match for the other. If the transcript had no matches or weak ones, or if it matched both photos equally well, this indicated a breakdown in the process and the judge would call a "pass."

The group manager submitted the prediction to the Firefly Trader, who would use it to execute the trade. The Trader would trade in accordance with the group's prediction. When more than one group submitted for the same prediction, the Trader would apply the majority vote rule to come up with an aggregate prediction.

After completing the trade, the Trader communicated the outcome to the group manager(s) in a timely manner so he/she could provide the feedback photo associated with the actual outcome to the remote viewer(s). Most groups reported they received feedback within 48 to 72 hours. Remote viewers were encouraged to complete a "feedback session" by closely comparing their transcripts to the feedback photo to determine what

matched. This completed what is referred to as a “feedback loop.”

The trial’s outcome would then be recorded in a shared spreadsheet maintained by the Firefly Traders.

Firefly Group Practices and Characteristics

To better understand specific methodologies used by the groups and characteristics of the group members, about a year after the project concluded the authors submitted an online survey to all Firefly group managers. Seven of the 8 group managers responded to the survey presented in Appendix B.

The 12 ARV groups that contributed sessions to Project Firefly had highly trained project managers with exposure to and training from ARV and RV founders. They were well-versed in the technical aspects, such as ensuring blind conditions, methodologies for judging, scoring, and making predictions, and target-pool creation. Prior to Project Firefly, they had worked hard for years to improve ARV statistics and learn from past performance. Collectively, they donated thousands of hours to this field.

Given ARV’s goal of predicting an unknown future outcome, it would be impossible for viewers and group managers to be anything other than blind to the outcome itself. Based on knowledge of the group protocols (and self-reporting by all but one manager), the authors have high confidence that all remote viewers in Project Firefly were also blind to both target photo options *prior* to the judging phases. Some group managers were blind to both photo options, having used randomization procedures, while others were aware of the photo options, having personally chosen them without randomization. Following submissions of transcripts, some groups used self-judging (meaning the remote viewers would need to see both photos in order to determine which photo was the best match to their transcript) while others used independent judging (meaning the manager or a third party would judge the transcripts instead of the remote viewers. This would prevent them from seeing the unactualized photo).

Three of the Firefly groups had only one member, while the others averaged 7 members each. More viewers were in groups that used self-judging rather than independent judging, including 6 groups using the online Winning Entanglements (WE) computer system. Three groups also used CAS (Computer Assisted Scoring software), a system created by Ed May based on Fuzzy Set Theory. One used ARV Creator (scripted Excel spreadsheet) and one used ARV Studio software. While Binary ARV was the standard protocol, the target pools varied between groups, ranging from simple objects only, to include locations, activities, and lifeforms (see Appendix A).

Some groups (i.e. P7B and WE groups) included newer and experienced remote viewers, while others (i.e. Sublime, Sharp, Evans) had only experienced remote viewers. Viewers were trained in a variety of methodologies, including ARV, Controlled Remote Viewing (Smith 1985), Extended Remote Viewing, simple clairvoyance, and dowsing. Most reported using modified versions of these.

Further responses to the post-project survey are presented in Appendix B, which contains specific information related to judging, predictions, randomization, communications, and viewer experience level.

Results, Protocol Adjustments, and Wrap-Up

Phase One

Following a rigorous trading schedule, the PFF Traders wagered 20% of the investment in each of the 33 trades between October 20, 2014, and December 19, 2014. Funds were relatively stable and fluctuated around the initial investment figure until they dwindled in the last two weeks. The losses resulted from 3 misses and unrealized winnings of \$4,000 on one prediction when a Trader was not able to enter the trade at the designated time. Phase One began with 54 investors and \$43,200 collected. Of the \$38,500 invested, \$21,014 remained at the end of Phase One, which had an overall 54% hit rate, as shown in Table 5. The solo groups (those with only one viewer) had a 59% hit rate.

Investors could cash out at the end of Phase One or contribute more money, and managers could revise their plans, if necessary. Eight new investors joined Firefly for Phase Two and 7 added more funds, bringing the total funds available to \$38,723.

Phase Two

After the Phase One losses, the Firefly trading team decided Phase Two would be organized into a series of short “runs” so adjustments to the protocol could be made, as needed. Chart 1 reflects the fluctuation of funds after each trade throughout the entire project. It also indicates the account balance after completing each run and outlines the different approaches taken and their results. At first, the Traders wagered 20% of the total Firefly account balance on each trade (full Kelly), but as the balance depleted they lowered the amount to 16% per trade and later to 10% per trade (half Kelly).

Run 1 began on January 26, 2015 (Week 11). Daily trades were based on a majority vote (MV) procedure using predictions from aggregate groups.

Around this time, the Traders debated whether to tell the membership

TABLE 5
Firefly Phase One, Run 1 – Hit Rate 54%

Firefly: Phase 1 Run 1 schedule: October 20, 2014, to December 19, 2014					
Week 1-9	Monday	Tuesday	Wednesday	Thursday	Friday
Group 1	FIRST GROOVE	P7B	FINANCIAL	SAGE	PSICHISENSI SOLO
Group 2	MWHITE SOLO	CROATORUM	SUBLIME	PEGASUS	JFK SOLO
Group 3		OMEGA	TRANSCENDENT		SHARP SOLO
Week 9	Miss	Pass	Pass	Miss	Hit
Week 8	Pass	Miss	Hit	Hit	Miss
Week 7	Hit	Miss	Hit	Hit	Pass
Week 6	Hit	Miss	Hit	Pass	Miss
Week 5	Miss	Hit	Pass	Hit	Pass
Week 4	Hit	Hit	Hit	Miss	Pass
Week 3	Miss	Hit	Hit	Miss	Miss
Week 2	Pass	Pass	Miss	Pass	Pass
Week 1	Hit	Miss	Miss	Hit	Hit

Predictions based on majority vote—several entities/groups per day

at large of the losses or even to disband the project. Each member of the trading team later indicated they were under a huge amount of stress as the money continued to dwindle and misses continued. During the last two weeks of Phase Two, Run 1, they made only simulated trades. Run 1 ended after 38 trades with a 36% hit rate.

In Run 1, a new precognitive tool that had shown a 64.7% hit rate in 25 trials prior to December 21, 2014, was added as a “group.” Instead of remote viewing, the “Survey” method relied on a participant’s instant response to a nonsensical pair of words, which was then associated with a particular undisclosed outcome. Mena sent the Survey weekly to all APP members until February, when he moved back to Brazil from Spain.

At that time, Mena told Rosenblatt he could no longer keep up with the day-to-day trading overview obligations because of the move and needed to find another setup. According to Mena, Rosenblatt suggested he could

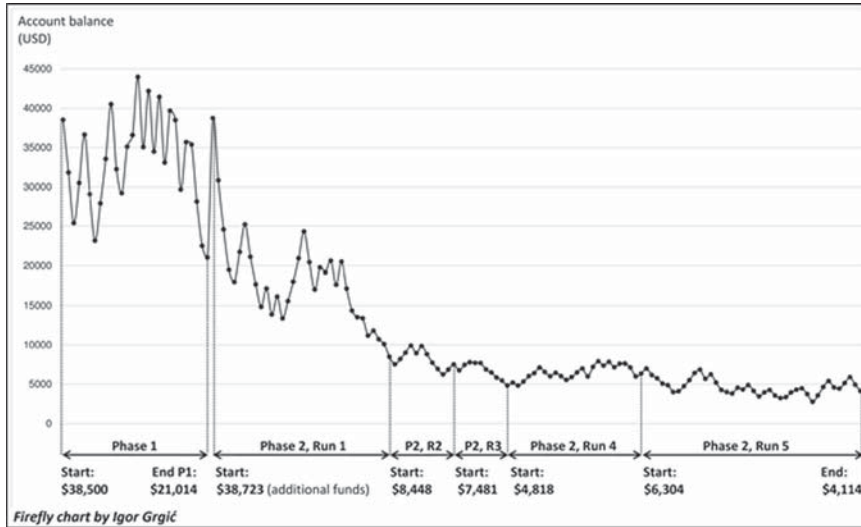


Chart 1. Firefly balance fluctuations through all trades (Oct. 20, 2014, to Dec. 18, 2015). Run 4 was the only period showing an increase in the Firefly trading account—starting with \$4,818 and ending with a \$6,304 balance.

step down as Firefly General Manager, leaving Rosenblatt and Grgić in charge. Mena felt it was within Rosenblatt’s right as APP founder to make such a request and therefore complied. When asked, Rosenblatt said he remembered it differently, as being a joint decision.

Mena announced the change at the next meeting, before Run 2 began. Some members who weren’t present said they were unaware of the changes in the management structure until Firefly ended in the fall. According to Mena, he remained on the Oversight Committee throughout the project.

Run 2 began on March 30, 2015 (Week 19), with a new approach that relied on predictions by the four best viewers, who had hit rates of 70% to 75%. Trades on Mondays, Tuesdays, and Thursdays were based on predictions by a single *entity* made of 2 viewers selected from the best 4. Traders placed simulated trades based on aggregate predictions from the other groups on Wednesdays and Fridays. Run 2 ended after 12 trades with a 50% hit rate. Including the 13 simulated trades, the hit rate was 52%.

Run 3 began May 25, 2015 (Week 27), with a return to trading each weekday using the prediction provided by each group’s manager. Trading was aborted in Week 30 due to 5 misses in a row. By the end of Run 3, the accuracy of the 4 best viewers had dropped to between 50% and 54%. Run 3 ended after only 8 trades with a 25% hit rate.

Run 4 began July 6, 2015 (Week 31), with one of 5 groups/entities—not the best individual viewers any more—providing predictions and with trading each weekday. This run showed the only increase in the hit rate, ending after 25 trades with a 60% hit rate. Previously, trades had preselected entry times and preselected currency pairs. During Run 4, however, neither a trade entry time nor preselected currency pair was used. Instead, when the Trader got the group manager’s prediction, he searched FOREX charts of different currency pairs for the best trade opportunity. For instance, if the group manager submitted an “Up” prediction, the Trader searched (with intention) for the best “Up” move opportunity for a 1:1 risk-to-reward trade.

Run 5 began August 31, 2015 (Week 39), with one of 5 groups/entities providing predictions and with trading each weekday. Starting in Week 45, Traders used predictions from APPI entities (solo viewers with high hit rates). Run 5 ended after 48 trades with a 48% hit rate.

Wrapping Up Firefly

Once the end date arrived, Chris Georges hosted a webinar with Firefly investors. While some questioned what went wrong and suggested improvements for future projects, many expressed pride at having engaged in such a grand experiment.

During a January 2016 webinar, Grgić gave a breakdown of the phases with their various protocols, stats for all Firefly groups, and an explanation of decisions made.

In a subsequent presentation entitled “Proposal for Phase 3,” Grgić suggested keeping any future endeavor simple, to eliminate complexity, focus on individual calls, and use groups of 2 to achieve the best psi efficiency. To help eliminate complexity, he suggested operating Firefly with only one tasker (for financials/FOREX) and Trader. If needed, the Trader could report to an oversight committee.

“I think that a team of two or three Firefly General Managers/Traders is not good for functioning of psi and psi efficiency,” Grgić said. He suggested either using viewers from existing groups/solos with hit rates of 60% or greater, or creating several new entities/groups comprising two top viewers. To keep things simple, only one group would be active at a time. Runs would be short, with breaks between runs. A side would be called only if both viewers agreed; if one passed or if their predictions canceled each other out, the prediction would be a pass.

Rick D. was one Firefly’s highest-contributing investors. Despite his losses, he continued to be enthusiastic, with an attitude of “let’s understand what happened so we can make use of that knowledge and perhaps move on to Phase Three or a new large-group endeavor.” He also performed some

independent inquiries of the trading team, which left him satisfied that everyone had dealt with the monies and wagering in an ethical manner.

While a few others also expressed interest in continuing on to Phase Three or a new project, no one volunteered to manage it, all citing a lack of time. In early January 2016, Georges mailed investors their remaining funds, along with a final report and tax documents, and Project Firefly closed as an official entity.

Discussion

What Went Wrong?

This was an extremely complex project involving multiple groups of individuals producing predictions. These were aggregated to form meta-predictions, which were then wagered upon according to the Kelly wagering method, and finally input into a financial apparatus (FOREX). Ultimately, that complexity, more than any other factor, may be at the root of the problem.

As we will demonstrate below, decisions to initiate Project Firefly, as well as those involved in how to apply the Kelly wagering strategy, were based on preliminary performance statistics that were too “large-grained.” The outcomes from earlier projects had been aggregated into a single statistic (the 62% hit rate), but those results included variables and individual group outcomes that were either unknown or unanalyzed prior to Firefly’s initiation. The post-Firefly analysis of the earlier Zulutrade project is one such example.

Other factors examined below include the effect of Majority Vote, displacement within single groups and aggregate group predictions, the number of trials, and the judging method used.

Kelly wagering strategy. Project Firefly was based on the premise that the past is a strong predictor of the future. Mena initiated the project after he became aware that APP groups were achieving hit rates above 60%. In the field of parapsychology, success rates in precognitive-based trials tend to be around 53% (Bem 2011).

When invited to submit comments for this paper, Mena provided the following statement:

The Kelly wagering system was simply chosen as the mathematical framework to optimize our betting strategy. It is not a controversial method; it is the optimal strategy. “Aggressive creation of wealth” would be the natural consequence of using an optimal approach, as long as the groups were able to perform around the 60% level indicated by historical data.

Alexis Poquiz, an active APP member and Firefly investor, who posted the following to the Firefly Investment Club (FIC) Google page, echoed his sentiments:

To blame our failure . . . to the adoption of the Kelly wagering strategy would be a mistake. . . . The bottom line is that our project was a disaster because we failed spectacularly to achieve our expected hit rate. Going forward, I would make two adjustments. The first adjustment would be to use a Kelly factor that is based on a lower hit rate than 60 percent. The second adjustment would be to change how the project ends. Originally we ended the project based on a set date. Instead of a set date, I would end the project based on a set number of wagerable predictions. This will alleviate the tension of having to produce a prediction week in and week out. I wholeheartedly believe that we can achieve success using the Kelly wagering strategy.

The chart Rosenblatt had shared at conferences and online showed that the 62% hit rate was an aggregate of group statistics. Some groups predicted sporting events (i.e. the over/under scores of football, basketball, or baseball games), and others made financial predictions using the stock market or Zulutrade (FOREX).

Among APP groups that predicted sporting events, the methodologies and results varied widely. A closer look at the top-ranked APP groups showed one used a mixture of logic and remote viewing with self-judging, and another group viewed “live.” Its members included some of the top viewers. Other high-performing groups based their predictions on dreams or tuning-in to emotions.

Although it wasn't known prior to Firefly, many groups making financial-related predictions were operating much closer to chance levels and, in some cases, below chance. This raises the question of whether measuring only groups mostly involved in financial predictions might have been a more accurate predictor of future performance than including higher-performing groups, many involved in other types of events.

Analysis of Zulutrade project. One way to assess ARV groups' future predictive behavior is to look at the most recent statistically significant historical data. Such data was collected by APP during the Zulutrade project, which lasted from April 28, 2014, to October 17, 2014.

Zulutrade is an online platform where one can execute FOREX trades without risk in a demo account and perform as a “FOREX signal provider.” Other investors can follow these trades.

After Firefly ended, Grgić and APP member Mark Samuelson completed an assessment of APP data from that prior six-month project, which shared some similarities with Firefly. According to Grgić, 7 APP groups

TABLE 6
Zulutrade Project – APP FOREX Groups April 28, 2014, to October 17, 2014

Group Name	Hit	Miss	Pass	ARV Protocol
Croatorum	2	5	16	Standard binary ARV
Financial	2	1	2	W.E.
FirstGroove	8	6	3	W.E.
LaurSolo	3	1	0	Standard binary ARV
Omega	2	5	10	W.E.
P7B	3	1	1	Standard binary ARV
Pegasus	7	7	4	W.E.
Sage	3	4	4	W.E.
Sublime	1	0	0	Standard binary ARV
TOTALS	31	30	40	

Results through 101 total Zulutrade trials: 51% Hit Rate

that participated in the Zulutrade project switched to Firefly, maintaining essentially the same structure in both projects (e.g., the remote viewers involved, protocol used, etc.). A technically identical ARV tasking was used to predict FOREX currency pair moves, and the trading team executed one trade per day / 5 trades per week. ARV groups were scheduled per trade day. Both projects had defined goals. In the earlier project, the goal—which wasn't achieved—was to rank among the top-performing Zulutraders; the project's 51% hit rate reflected 31 hits and 30 misses.

The data show, to put it simply, that the Zulutrade ARV groups did not produce a combined hit rate above 60%, as needed for Firefly success (Table 6).

The majority of the Zulutrade groups used what is referred to as the Winning Entanglements (WE) protocol. These group statistics were easier to access than those for groups using other protocols because WE automatically collects the data, which viewers input into the online system. Predictions and outcomes are published to the APP "predictions email list" that full members can access, which allowed for easy assessment.

Most WE viewers did self-judging and didn't have to wait for independent judges to assess their sessions. That allowed more viewers to participate, and WE managers tasked more sessions (68 WE Zulutrade sessions vs. 33 by other groups). Additionally, APP often placed new

TABLE 7
Comparison of WE Firefly Groups and Other Groups/Entities

	Winning Entanglements	Other
Hits	66	60
Misses	66	60
Passes	68	75
Total predictions	200	195

viewers into WE groups, so more inexperienced viewers may have been in these groups.

An assessment of Project Firefly's data showed many of these same WE groups went on to contribute slightly more predictions than other groups (Table 7) despite their lower hit rates during the earlier, pre-Firefly Zulutrade trials. Table 8 lists all the groups and protocols used in Project Firefly, with their hit rates.

Consequently, the commonly cited 62% pre-Firefly hit rate, while deemed an accurate statistic by Grgić and Samuelson, was not well enough defined nor understood to serve as a predictor of success, as mandated by the Kelly wagering method. Based on this analysis, a more conservative approach than investing 20% of all monies should have been applied at the start of the project.

Majority Vote: Single Group vs. Multiple Groups

Project Firefly had an aggressive wagering schedule driven by 5 predictions a week. At first, it was thought having input from 2 or more groups might lend strength to a prediction. That made it desirable to have more than one group of viewers contribute predictions each day so Traders could get trading direction based on majority vote (MV).

Mena told the authors,

Project Firefly provides an important insight into the effect and inner workings of Majority Vote procedures applied to psi. Redundancy methods in general, and MV procedures in particular, are techniques designed to improve the reliability of psi to a level suitable for practical application. Redundancy provides the basis for the methods of increasing the accuracy of signals in normal communications systems, and many techniques proposed to enhance the reliability of psi follow this same path. The 'signal-enhancement' hypothesis holds that if a low-level psi effect occurs on the

TABLE 8
Firefly Hit Rates by Group for October 20, 2014, to December 18, 2015

Group Name	Hit	Miss	Pass	Protocol	Group Type	Judging Type	Hit Rate
Mark S	2	0	0	Binary*	Solo	Indep.	100.0%
SuperSolos	1	0	0	Binary*	Group	Indep. & Self	100.0%
SHARP	9	4	3	Binary*/ ARV Creator	Solo	Self	69.2%
Sublime	9	4	12	CAS, live binary ARV	Group	Indep.	69.2%
Mwsolo	8	5	5	Binary*/ ARV Creator	Solo	Self	61.5%
FirstGroove	22	15	13	W.E.**	Group	Self	59.5%
PSI-SOLO	9	8	8	Other binary ARV	Solo	Self	52.9%
Financial	19	17	11	W.E.**	Group	Self	52.8%
P7B	9	9	15	Binary*/ ARV Studio	Group	Indep.	50.0%
APPI/other	5	6	1	Various	Group	Indep. & Self	45.5%
Sage	5	6	14	W.E.**	Group	Self	45.5%
Pegasus	12	15	21	W.E.**	Group	Self	44.4%
SURVEY	3	4	22	Survey	Group	Survey	42.9%
Omega	8	12	9	W.E.**	Group	Self	40.0%
JFK	4	10	3	Binary*	Solo	Indep.	28.6%
Transcendent	1	6	6	CAS (modified)	Group	Indep.	14.3%
Alpha Omega	0	2	0	Binary*	Group	Indep.	0.0%
Live	0	1	0	Binary*	Group	Indep.	0.0%
SuperBinary	0	1	0	Binary*	Group	Indep.	0.0%
SuperWE	0	1	0	W.E.**	Group	Self	0.0%
TOTAL:	126	126	143				50.0%

* Standard binary ARV

** Winning Entanglements

individual predictions, then Majority Vote procedures will be expected to increase the accuracy of psi to a high level. This did not happen in Firefly.

In fact, the only run that reached a 60% hit rate was Phase Two, Run 4. Grgić partially attributed its success to having a prediction from only one entity per day. He also cited a new-to-APP trading protocol used only during Run 4 (described previously).

Displacement Affects Single Group and Aggregate Group Predictions

Another factor affecting Firefly's results was displacement, a common and troubling phenomenon where remote viewers accurately describe something other than the intended target. It occurs in ARV and other experimental parapsychology projects that use sets of photos as a judging method. Dr. Patrizio Tressoldi, a parapsychologist who has conducted extensive meta-analysis in areas such as the Ganzfeld body of research, advised in email correspondence with the authors that displacement is one of the most perplexing issues he and other researchers continue to witness. At face value, it makes it appear statistically that psi was not present, when in actuality psi may have been operating in full force but toward the wrong subject matter.

This happened 6 times between October 2014 and July 2015. In these 6 instances, all groups submitting predictions on a specific Firefly trade day were in agreement (no passes), but they predicted the unactualized side. After July 2015, the trading team abandoned the approach of having more than one group make a prediction for the same trade. Afterward, predictions from only one Firefly entity (group or solo) per trade day were used.

Additionally, other examples address possible displacement within a single group. Thirty-nine instances of strong consensus predictions occurred at the group level, resulting in a 48% hit rate. Strong consensus occurred when there was a 3-point spread difference or advantage for one side, such as 3 sessions predicting one side and 0 sessions for other side.

Number of trials. Jon Knowles, who served as an "Apprentice Trader" from October 2014 through March 2015, posted to the Firefly Investment Club Google page:

The mandate to have 240 or so trades in the course of 15 months placed a heavy burden on the project in a variety of ways. Making so many trades means lots of taskings each week, lots of sessions, and lots of analysis.

In support of Knowles' observation, studies have shown that fewer trials seem to be more effective than too many close together. In 1984, Russell Targ and Keith Harary completed two ARV studies (Harary & Targ

1985). The first, featured in *The Wall Street Journal*, yielded \$120,000. On a second, unsuccessful attempt, they shortened the intervals between trials and viewers sometimes started a new trial before receiving feedback on an earlier one (Targ 2012). In 1995, Targ repeated the study with the earlier protocol's less-frequent trials and results were highly significant (Targ, Kantra, Brown, & Wiegand 1995).

These researchers suggested too many trials in a short period of time may lead to both viewer and manager fatigue.

Judging. Outside of Project Firefly, fluctuations in judging have been observed in independent tests performed by Grgić, as well as those conducted by Poquiz, creator of the Dung Beetle Method of scoring (Poquiz 2013). While these exploratory trials did not include large sample sizes, their results demonstrated the need for further evaluation of differences in judging styles and predictive decision-making. Various factors can lead to misjudging: judging style and experience, taking into account AOLs (analytical overlays), or relying on late-session data. (Some argue that first impressions or the first gestalts are usually correct.) Accurate judging can also be impaired or derailed when photo targets are too similar to each other or when they differ in entropy or numinosity (May, Spottiswoode, & Faith 2000).

Grgić found instances where scores for both photo targets (whether actualized or unactualized) were high (each above 3.5 on the 7-point SRI/Targ scale) and when scores for both sides were too close, with less than two points of separation between them. Despite that, sometimes a judge made a call for one side when he should have passed because of a mixed signal, as evidenced by data in transcripts matching both sides.

Within Project Firefly, no quality control measures ensured the accuracy of group managers' judging or predictions. The Traders did not generally question the group managers' predictions, particularly in earlier runs when most of the losses were sustained.

Self-judging. In ARV projects where viewers are tasked with describing the feedback photo they will see after the outcome of the event is known, self-judging is controversial because it also exposes viewers to the unactualized photo. Over the years, on many remote viewing email lists and online forums, numerous APP members and others involved in ARV have repeatedly commented that self-judging derailed their sessions. However, Rosenblatt suggested this belief only serves as a self-fulfilling prophecy for some viewers, citing instances where viewers were able to overcome displacement with practice and self-discipline.

With so many other variables to consider, the effect of self-judging on the outcome of Project Firefly, if any, cannot be determined. As noted earlier, most, but not all, Winning Entanglements groups used self-judging.

WE groups use an online system Rosenblatt developed that automates the ARV process. Viewers see their coordinates in the system, upload their transcripts, and most self-judge them against the photo sets. The overall hit rates for those groups ranged from FirstGroove's 59.5% to Omega's 40%. At one point, a self-judging solo viewer had 9 hits in a row with only one pass. Non-WE groups that used independent judging had hit rates ranging from Sublime's 69.2% to Transcendent's 14.3%, as shown in Table 8.

Conclusions and Future Study

In summary, the consensus among this paper's authors, supported by the extensive contributions made by other Firefly key participants, is as follows:

First, predictions based on aggregate groups on a single trade day did not fare as well as single entities (groups or solos). Instead, the data generally support using the best viewers and teams, as per their hit rates listed in Table 8, and keeping the protocol simple. An exception to this was seen in Phase Two, Runs 2 and 3, when the top solo viewers' hit rates dropped from around 70% to roughly 50%. Those data was not statistically significant, however, because no solo viewer did more than 11 non-passing predictions during those runs.

Second, the goal of having 240 trades in a single year placed a great deal of stress on the trading team. Of 249 predictions, 72 were passes. This may be an example of too many predictions in too short a timespan, as seen in the Targ/Harary study (Targ 2012).

Third, an independent Oversight Committee could provide valuable support for the trading team by serving as a check and balance on trading activity, monitoring protocol, and implementing a process to make changes with greater transparency for the viewer/investors. This could be critical if an aggressive wagering method is being used and early losses are incurred.

Fourth, the Kelly wagering method should be used only after verifying the hit rate for the specific viewers and a specific protocol. In this instance, subsequent examination of the pre-Firefly data showed many of the entities used in Firefly had hit rates below chance for similar financial predictions. In such cases, a more conservative approach than investing 20% of all monies should be applied. Further study on the hit rates of different protocols is needed.

Post-Firefly

Since the conclusion of Project Firefly, APP has continued to gain members and flourish. At APP's annual conference in June 2016, Rosenblatt included Firefly's hit rate in the charts shown, but he focused on APP's successes. He

often repeated two of his favorite sayings: “Wager wisely, if you wager,” and “Get rich slowly.” He also wrote, “What seems most important is to use what we believe we have learned to improve our personal ARV/RV skills and group applications.”

When asked about Grgić’s and Samuelson’s study of pre-Firefly data, which showed the financial groups’ overall hit rate was only 51%, Rosenblatt indicated he had never assessed the data in that way before. In a February 3, 2016, email response to the first draft of this paper, he stated: “I believe the FF [Firefly] low hit rate is due to internal money issues, plus the intensity/stress unwittingly placed on the project at the beginning.”

Mena said he believes other factors were at play:

I disagree with any hypothesis that states that unconscious money issues related to this aggressive wealth approach are behind the group’s inconsistent results. Historically, inconsistent psi effects were attributed to unconscious processes. It is time this meme is recognized and discarded as useless. This approach has provided little explanatory or predictive value after 70 years of discussion and research. More specific hypotheses are needed.

In a February 5, 2015, post to the Firefly Investment Club Google list, Georges said:

[The] project was not a financial success. In terms of organization and coordination involving many people throughout the world with varying tasks, it was a monumental achievement in the ARV community. Surely something to be proud and part of. The knowledge obtained and the experiences realized will continue leading us in paths of discovery.

In a similar vein, APP member Poquiz posted:

Financial success is but a mere step in our journey of elevating global consciousness to the reality of precognition. We must not allow this temporary failure to weaken our resolve. Albert Einstein once said, “Failure is success in progress.” And on that account, we have made very good progress toward success. We need only continue our efforts.

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Disclaimer

As with any project involving multiple “players,” this paper reflects diverse viewpoints, opinions, interests, and concerns. We, the authors, have done our best to create a balanced picture by soliciting and including comments from those who were both longtime members of APP and most intimately involved with the project from start to finish. Earlier drafts of this paper underwent extensive peer review within and outside of the Applied Precognition Project. That being said, any opinions presented within this article should be read as reflective of the authors’ own viewpoints (as both project participants and subsequent investigators) and/or of belonging to those specifically quoted within the article itself, rather than as representative of the former Firefly management team members or Applied Precognition Project’s owners. It is our sincere hope that this paper will encourage further productive discussion for and between all those who were involved.

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Appendix A

ARV Methodologies Used in Project Firefly

Binary ARV. Binary ARV is the standard protocol within the ARV subculture. It has two possible outcomes, and a photo is attached to each outcome. The viewer does one session per trial with the intention of describing the feedback photo they will see after the event, which is the photo connected only to the winning outcome.

Binary ARV—"ARV Studio" software. During and following Project Firefly, Igor Grgić used the "ARV Studio" software he developed to manage the P7B group (Grgić 2015). The full-featured computer program automates and simplifies all phases of a standard binary ARV trial. Those phases include: tasking, photo target selection and pairing, judging, and feedback.

The software features ARV task creation, random coordinate number (Task Reference Number) generation, automated task sending to remote viewers' emails, random and double-blind photo target selection, random and double-blind association of the outcomes to the photo targets, judging and scoring sheet, automated ARV prediction email sending, feedback photo email delivery, and data-keeping. It can be used for both solo and group projects.

Built-in algorithms ensure dissimilarity of computer-selected photo targets from a large pool of photo files, and also ensure non-repetition of selected photo targets for a pre-defined number of ARV trials (www.arv-studio.com).

Binary ARV–“ARV Creator” scripted spreadsheet. Two of Firefly’s solo remote viewers, Gary Gholson and Mark White, used “ARV Creator.” Over many years, White developed and refined this scripted Excel file, which enables a user to quickly and easily generate a standard binary ARV project.

ARV Creator automatically generates Target Reference Numbers (TRN), randomly selects two photographs by category from a very large photo set, and creates a project with the click of a button. The customizable spreadsheet can be used solo or by a team of viewers. The user interface and accompanying target set are very user-friendly.

Lively ARV (‘Live’ Binary ARV). “Lively” is a term Sublime’s group manager borrowed from group manager Mark Samuelson to designate “live” viewing sessions. During Project Firefly, Sublime group members met online via webinar. They started by socializing, seeing each other on video, then turned off the video while their group manager led them through an opening meditation involving light running through the body. Then they completed their viewing sessions. It is unknown how many of Sublime’s predictions for Project Firefly used the Lively method compared with the other reported methods.

Winning Entanglements (WE) software. Prior to and during Project Firefly, APP leader Marty Rosenblatt personally managed several groups that used his Winning Entanglements (WE) software. It has a varied photo pool of locations, activities, objects, etc., which allows for double-blind conditions, given that the project manager doesn’t see the photo choices prior to the viewer completing the session. Most WE groups in Project Firefly used self-judging. Over the years Rosenblatt has conducted numerous, in-depth free webinars demonstrating WE. These videos are available on the APP website and can provide further insight into the general protocols and technology WE groups use (www.appliedprecog.com). During Project Firefly, Rosenblatt exclusively used the WE software for the following groups: Omega, Financial, and Pegasus. Scott Williams used either WE or CAS (see below) for his Sage and Transcendent groups. A few individuals acting as a group of one used WE, with modifications. Those who used WE ranged from inexperienced through advanced viewers.

Computer Assisted Scoring (CAS) software. The Sublime Group, Transcendent, and Sage used the CAS software/protocols. “CAS” is the acronym APP group managers gave to the computer software system designed by Dr. Edwin May, who does not refer to it as “CAS.” His system is based on Fuzzy Set Theory, and on the decades of research he and his colleagues performed at SRI aimed at overcoming errors and challenges

in human judging and target selection (May 2006). One distinctive feature of this system is its use of a specific target pool comprising solely photos of locations collected from *National Geographic* archives and “cleansed” of people, animals, and transportation devices. This system was used by Bierman (2013) and by a few APP group managers for about one year prior to its use in Project Firefly.

CAS is designed to eliminate the need for a human judge to actually see the photo options. However, it does require an independent “rater” to look at the viewer’s transcript and indicate on a scoresheet if a pre-determined set of descriptors are present. This information is input into a computer. According to APP group managers, informal trials using CAS prior to Firefly showed mixed results. Software glitches at times resulted in missed trials, and raters required a learning curve to understand the items they were scoring. The efficacy of the CAS method in Project Firefly cannot be determined because groups that used CAS also used other protocols. A breakdown was not available of how many predictions were made using each protocol.

Survey. Carlos Mena devised a “Survey” based on parapsychological studies that suggest spontaneous occurrences of psi occur from quick, unconscious responses. Rather than pair photos with the direction of the FOREX moves, it used nonsensical word lists. The premise was to use the unconscious somatic responses of a viewer, who was advised to rapidly select the best word from a list of multiple-choice options. Because it took very little time to complete, Mena sent the Survey to all willing Firefly participants, not to one particular group.

APPENDIX B

**Scoring, Prediction Criteria, Errors Related to Metagroup
Communications, Table Hit Comparison, Additional Information
(self-reported by group managers)** [Tables created by Igor Grgić]

Manager Name	Group/Solo Name	Group Type	Number of Viewers	Judging Type	Manager's Other Roles
Gary Gholson	Sharp	Solo	1	Self-judge	No
John Kovacs	JFK	Solo	1	Independent judge	No
Russ Evans	Psichisensi	Solo	1	Self-judge	No
Igor Grgić	P7B	Group	7	Independent judge (group manager)	Trader, Firefly manager
Nancy Smith	Sublime	Group	7	Independent judge (group manager)	Judge for another group
Marty Rosenblatt	Omega, Financial, Pegasus, Firstgroove, APPI groups	Group	5 to 10 per group	Self-judge	Trader, Firefly manager
Scott Williams	Sage, Transcendent	Group	Several	Self-judge, independent judge	no

Manager/ Group	Descriptions of the ARV Protocol(s) Used	Target Pool Description	Target Selection and Randomization
Gary Gholson / Sharp	Binary ARV using <i>ARV Creator</i> (scripted Excel spreadsheet)	Locations and Activities, Simple Objects	<i>ARV creator</i> randomly picked target pairings blind
John Kovacs / JFK	Binary ARV	Simple Objects	Independent judge
Russ Evans / Psichisensi	High volume of data, sketch input direction, 3 advance visuals. Great data separation 20+ target direction. Advance image priority, regular sketches.	Locations and Activities	Solo/Viewer
Igor Grgić / P7B	Binary ARV using <i>ARV Studio</i> software. Software selects photo targets double blind.	Locations and Activities, All: lifeforms, structures, landscapes, activity	Prepared by indep. judge; ARV Studio randomly selects pairings blind
Nancy Smith / Sublime	CAS, Binary ARV - 'Lively' method where remote viewer's cooldown and do RV online live	Locations and Activities, Simple Objects, CAS (Ed May's Pool), Other types of targets	Independent judge (group manager); viewers; CAS
Marty Rosenblatt / 5 groups	WE. Online system sends two blind coordinates to viewer's email. Viewer submits two sessions and selfjudges.	Locations and Activities, Simple Objects	WE system randomly selects prepared target pairs
Scott Williams / 2 groups	WE (see above), CAS (Computer Assisted Scoring)	Locations and Activities, Simple Objects, CAS target pool	WE system randomly selects prepared target pairs

Manager/ Group	Target Selection Guidelines	Viewer's Blindness to the Target at Viewing Time	Manager's Blindness to the Target Prior Viewing Time
Gary Gholson / Sharp	Random photosites using <i>ARV Creator</i>	Yes, at all times	Yes, at all times
John Kovacs / JFK	Private guidelines based off of 10 yrs of private signal line data	(not answered)	(not answered)
Russ Evans / Psichisensi	Divergent aspects	(not answered)	(not answered)
Igor Grgić / P7B	Dissimilar as possible in all aspects	Yes, at all times	Yes, at all times
Nancy Smith / Sublime	(not answered)	Yes, at all times	(not answered)
Marty Rosenblatt / 5 groups	(not answered)	Yes, at all times	Yes, at all times
Scott Williams / 2 groups	(not answered)	Yes, at all times	(not answered)

Manager/ Group	Scoring / Rating Method	Rules or Criteria for Making Prediction	Occurrence of Judging and Protocol Errors
Gary Gholson / Sharp	Initial impression, feel, and knowing	(not answered)	No
John Kovacs / JFK	CR Scores 1–7	Use a specific criteria or rule of a particular point spread to make predictions	No
Russ Evans / Psichisensi	Simple matching - matches one or the other, no scores	Use a specific criteria or rule of a particular point spread to make predictions	No
Igor Grgic / P7B	CR Scores 1–7	Using all sessions. Predictions based on majority vote. Sometimes majority vote but with 2 point spread rule.	Yes (judging error two times)
Nancy Smith / Sublime	CR Scores 1–7; 3 point scale; Figure of Merit (CAS)	Use a specific criteria or rule of a particular point spread to make predictions.	Yes
Marty Rosenblatt / 5 groups	CR Scores 1–7	(not answered)	(not answered)
Scott Williams / 2 groups	CR Scores 1–7, Figure of Merit (CAS)	(not answered)	(not answered)

Manager/ Group	Predictions per Week	Prediction Communication to the Trader	Outcome Communication from the Trader	Feedback Sent to Viewers	Private Wagering
Gary Gholson / Sharp	1	Email	Email	Within 24 hours of <i>viewing</i> time	No
John Kovacs / JFK	1	Email	Email	Within 24 hours of <i>viewing</i> time	No
Russ Evans / Psichisensi	1	Traders / managers did as they chose regardless of input	Email	Within 24 hours of <i>viewing</i> time	No
Igor Grgić / P7B	1	Email	Trader - direct outcome access via trading platform	Within 48 hours of <i>viewing</i> time	Yes, GM and some viewers
Nancy Smith / Sublime	1	Email	Email. Sometimes made personal outcome decision.	Within few days of <i>viewing</i> time	Yes, GM
Marty Rosenblatt / 5 groups	1 per each of the groups	Email	Trader - direct outcome access via trading platform	Within few days of <i>viewing</i> time	Yes, some viewers
Scott Williams / 2 groups	1	Email	Email	(not answered)	(not answered)

Manager/ Group	Experience Level of the Viewer(s)	RV Techniques Used by Viewer(s)	Acquaintance with Viewers	Firefly Participation — Impact on Group	Group Performance during Firefly
Gary Gholson / Sharp	10 years	Loose and simplified CRV	Very well	It was fun, but I quickly lost motivation when I was personally doing well, yet the group was not.	Stayed the same
John Kovacs / JFK	10+ years	CRV	Very well	I didn't like the energy of it and told it was doomed for failure, too many overlapping intentions . . .	Decreased
Russ Evans / Psichisensi	Plenty	ERV, dowsing, mental images	Very well	Not positively	Improved
Igor Grgić / P7B	Most 5-10 yrs of experience; 1 or 2 novices	Simple CRV, freestyle ARV	Very well	Performance was same as in our other projects	Stayed the same
Nancy Smith / Sublime	Experienced, advanced	(not answered)	Very well	It was a long project that encouraged a little boredom.	Don't know
Marty Rosenblatt / 5 groups	From novices to very experienced	Various RV techniques	(not answered)	(not answered)	(not answered)
Scott Williams / 2 groups	(not answered)	(not answered)	(not answered)	(not answered)	(not answered)