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Vulnerability of Older Adults to Deception in Prison and Nonprison Contexts

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Media reports frequently depict older adults as victims of deception. The public perceives these stories as particularly salient because older adults are seen as fragile victims taken advantage of because of trusting behaviors. This developmental investigation of deception detection examines older and younger adults interacting in 2 contexts, prison and the "free world," to discover whether older adults are vulnerable to deception. Younger prisoners were found to be lie biased. Older adults were better able to discriminate lies than younger adults, and this effect was localized primarily to older female adults. Findings indicate that discriminability strongly increases from younger to older age for women, whereas men do not show an improvement, as age increases, in making decisions about statement veracity.

News reports shown on TV and reports written in newspapers frequently depict older adults as victims of deception. Viewers and readers perceive these stories as particularly salient because older adults are seen as fragile victims who are taken advantage of because of their trusting behaviors. Reports often describe perpetrators as "con artists" who, using deception in tactical ways, take advantage of an older adult's trust by, for example, fraudulently obtaining cash for home improvements that were not performed or running insurance or mail order scams (McGhee, 1983). It has been reported that in the United States, over one half million victims per year, ages 55 and over, are illegally taken advantage of financially (Tueth, 2000). The Bureau of Justice Statistics indicated that about 20% of older adults are victims of some kind of fraud (Bachman, 1992). Life savings may not be readily replenished, and the trauma and shame of being deceived and taken advantage of is also psychologically devastating. Attempts to defraud older adults, with few exceptions, are perpetrated by younger adults. In Kansas City, Missouri, for example, police offense records of older adult crime victims, which included fraud (burglary, robbery, assault, fraud, homicide, and rape), showed that victims had reported that almost 90% of perpetrators of all of these crimes against them were under the age of 30 (Midwest Research Institute, 1977). Recent data on the perceived age of offenders who committed the same types of crimes against older adults showed that 85.4% of the offenders were under 30 years old (Rennison & Rand, 2002). Therefore, it is of extreme import to understand reasons why older adults might be vulnerable to deception, especially from younger adults.

There is a paucity of studies in the deception literature that have included older adult populations. There are no known interactive deception studies in which dyads composed of younger deceivers and older detectors have participated, which would provide clues to the accuracy and biases of older adults in deceptive interactions. A single study that was noninteractive, conducted by Parham, Feldman, Oster, and Popoola (1981), revealed cross-generational detection inaccuracies when older adults judged videotaped nonverbal behavior of individuals who were expressing truthful or deceptive reactions after consuming bitter or sweet drinks. Older adults rated younger male individuals' deceptive nonverbal behaviors accurately but rated younger female individuals' deceptive behaviors as being more truthful than the young female individuals' truthful behaviors. Because of the noninteractive quality of the manipulation, these findings are not necessarily as valid as interactive deception manipulations (refer to Buller & Hunsaker, 1995; Buller, Stiff, & Burgoon, 1996). In contrast, deception studies that have used younger college-student participants are extensive, and the younger adults' deception detection behaviors have been well-defined. Research findings indicate that younger adults show a *veracity effect*. Because they are truth biased, younger adults exhibit greater accuracy in detecting truthful statements but are not very discriminating when deceptive signals are presented (Levine, Park, & McCornack, 1999), indicating that younger adults are vulnerable to deception. *Truth bias* is the tendency to believe that

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most messages one hears will be truthful (McCornack & Parks, 1986), and the truth-bias contributes to the high levels of truth decisions in those studies.

The principal questions motivating the present developmental decision-making research were as follows:

1. Are older adults as vulnerable to deception as are younger adults, and, if so, do older adults show this pervasive tendency to judge most messages as truthful, as in past studies with younger adults in a laboratory context?

2. In contrast, are older adults not vulnerable to deception in a context where con artists are omnipresent, and suspicion is suspected to be high?

In a laboratory context, we expected younger adults to replicate the same highly truth-biased decision making as in past studies. We included two context-based groups of older and younger adults in this study, so that if one of the groups was truth biased in a laboratory context, whereas the other group was not truth biased in the highly suspicious context of prison, then we would argue that social and cultural contextual elements increase or decrease the individual's perceived probability of being lied to or not, thus affecting his or her tendency to make truth-biased or lie-biased decisions. *Lie bias* is a tendency to believe that most messages one hears are deceptive (Levine & McCornack, 1991). In other words, in a nonprison context, individuals expect to hear honest, complete, nonambiguous, and on-topic discourse from others during conversations (Grice, 1989). In prison, younger adult prisoners have shown that they are lie biased, indicating that most messages that they heard in experimental interactions were judged to be deceptive (G. D. Bond, Malloy, Arias, Nunn, & Thompson, in press). A lie bias in younger adult prisoners' decision making indicates that state suspicion, also defined as suspicious cues in the environment, is interacting with dispositional levels of communicative suspicion to create a decision-making bias in that population.

Context Effects Predicting a Lie Bias in Older Prisoners

The G. D. Bond et al. (in press) research showed that younger prisoners were accurate lie detectors but also made a high number of lie decisions (60% of messages were characterized as lies) as well. Given that older prisoners, likewise, are living in the same suspiciousness-arousing context, they might also show a lie bias when making veracity judgments. Particularly, prisoners' judgments about statement veracity in this study should be affected by the social and cultural contexts of prison. Social contextual elements, in natural conversational settings, are hypothesized to take the form of *context markers*, which are cues in the physical and social environment that make up the context for communication (Bateson, 1973). Context markers provide communicants with a framework for interpreting, constructing, and reconstructing their understanding of the meaning of conversations (Neuman, Bekerman, & Kaplan, 2002). The effect of cultural context on cognition has been demonstrated by Trafimow, Silverman, Mei-Tai Fan, and Shui Fun Law (1997) in a social cognition study that investigated the effects of language and priming of private and collective self-cognitions. Trafimow et al.'s (1997) research examined students from Hong Kong and the United States, and the researchers found that priming the private self increased retrieval of private self-cognitions, whereas priming the collective self increased retrieval of collective self-cognitions. In prison, prisoners engaged in interactions are primed by the prison culture within which they are conversing, and so the cumulative, collective effect of those cultural elements might prime the retrieval of collective prisoner beliefs, values, and thoughts. Therefore, prisoners, who as individuals outside of prison might normally be truth biased, might alter their decision-making processes within the social and cultural contexts afforded by prison, showing a lie bias, whether they are members of younger or older age groups.

Developmental Trajectory Predicting a Truth Bias in Older Prisoners

Oppositely, age-related differences in decision-making biases might be found in this study because older adults, when making decisions, rely predominately on heuristic processing as age increases (Klaczynski & Robinson, 2000). *Heuristics* are rules of thumb that people use to make decisions about problems that are ill defined, such as detecting whether or not a person is deceptive. Two-process theories of decision making (e.g., White, 1989) indicate that heuristic and analytic processing occur in parallel, and depending on the motivation, situation, cognitive abilities of the decision maker, and other variables, one mode of processing will be predominant in solving the problem (Klaczynski & Robinson, 2000). Mutter and Pliske (1994) indicated that changes in cognitive abilities such as memory processes over the life span might be accompanied by changes in older adults' decision-making strategies. For example, younger adults who have greater working memory capacity might use a strategy of active, analytic social information processing when they are motivated by accuracy or other goals, given that younger adults are comparatively more able to hold several pieces of behavioral information in working memory in order to process them (Hess, 1994). This is in contrast to older adults, who exhibit a reduction in working memory capacity and processing resources (Craik & Byrd, 1982), so analytic processing might be used with less frequency and only strategically to conserve diminished cognitive resources, leaving personal experience (Berg, Strough, Calderone, Sansone, & Weir, 1998) as the primary foundation for solving problems and making decisions. As Levine and McCornack (2001) and G. D. Bond, Malloy, Thompson, Arias, and Nunn (2004) have demonstrated, truth-biased adults who predominately use heuristics to make decisions about statement veracity will show a greater tendency toward being truth-biased than those who use more analytic strategies to diagnose statement veracity. Therefore, older adults in both contexts might be truth-biased, because they might tend to predominately use heuristics when making decisions.

Older Prisoners in U.S. Prisons

Developmental research that includes samples of older adults in prison is sparse. The older prisoner population is small. There were 2,100,146 prisoners in the United States at the end of 2001; 1 in every 146 U.S. residents was incarcerated in a state or federal prison or in a local jail (U.S. Department of Justice, 2002). The

median age of prisoners in state and federal correctional institutions in 1997 was 34 (U.S. Department of Justice, 1997). In 1997, prisoners 55 years old or over numbered 37,498 out of 1,148,679 prisoners (or about 3.3% of the total prisoner population) in state or federal correctional institutions (U.S. Department of Justice, 1997). One of the reasons that older prisoners are not studied more intensively is the small size of the population relative to younger aged prisoner groups. However, to investigate whether older adults show context effects in their decision making or whether developmental elements affect their veracity decisions, we needed to include two very different groups of older adults—those not incarcerated and those incarcerated—to investigate possible explanations that might characterize a vulnerability to deception.

Hypotheses and Research Questions

Decision-Making Accuracy and Biases

The primary goal of this research is to discover relationships between context and decision-making accuracy and biases and/or relationships between a general developmental trajectory and decision-making accuracy and biases, characterizing vulnerability to deception. Younger adults are predicted to exhibit biases because of context effects; when in a nonprison context, younger nonprisoners are expected to exhibit a truth bias. Decision-making bias is measured using signal-detection theory (Green & Swets, 1966). Younger prisoners are predicted to show a lie bias, also because of context effects, as measured using signal-detection theory.

A quantification of accuracy and its association with bias allows for the construction of an algorithm used to determine whether truth-biased groups evidence a veracity effect (Levine et al., 1999). Younger nonprisoners are predicted to show greater accuracy in detecting truthful messages. Lie detection and truth detection accuracy are calculated separately, following the preferred convention in deception research and using an average of correct lie decisions out of total lie statements told and an average of correct truth decisions out of total truthful statements told (e.g., C. F. Bond & Atoum, 2000). In the veracity effect algorithm, truth bias and truth detection accuracy must show a strong positive correlation, and truth bias and lie detection accuracy must hold a strong negative correlation, with a large effect size shown (Levine et al., 1999). Younger prisoners, in comparison, should show greater accuracy in detecting lies, coupled with a lie bias, whereas truth detection accuracy should be below chance, with a large effect size shown, forming an algorithm that defines a *reversed veracity effect* (G. D. Bond et al., in press). Thus, although we were primarily interested in examining biases, we calculated accuracy to examine possible veracity effects and reversed veracity effects.

Older adults' biases and accuracy are dependent on the outcome of a context effects versus developmental trajectory explanation, and so a research question is constructed for those groups. Like younger nonprisoners, older nonprisoners are predicted to show a truth bias. Older adult prisoners' decisions should be lie biased, on the basis of a context effects explanation, or truth biased, on the basis of a developmental trajectory explanation. If one or both groups of older adults are truth biased, then a veracity effect should be exhibited; if one or both groups of older adults are lie biased, then a reversed veracity effect is predicted.

Postdecisional Confidence

Toris and DePaulo (1985) found that when making lie judgments, suspicious individuals express significantly lower confidence in their judgments than those individuals not primed to be suspicious. Confidence in making correct judgments is no different than when making incorrect judgments, although confidence in making truth judgments is higher than when making lie judgments (DePaulo, Charlton, Cooper, Lindsay, & Muhlenbruck, 1997). Lie and truth detection are two possible outcomes from the same cognitive process, and if confidence is lower in making lie judgments than truth judgments, then this outcome probably reflects the bias that individuals have toward believing most statements (the truth bias). Therefore, a replication of these results would be demonstrated if nonprisoners showed greater confidence in making truth judgments in comparison to lie judgments. Contrary to what one might expect, confidence in making truth judgments, for lie-biased prisoners, is higher than when making lie judgments (G. D. Bond et al., in press), and so a replication is predicted with younger adult prisoners. However, because older adult prisoners have not been studied in respect to biases and confidence in making veracity decisions, a research question is constructed in which older adults may or may not hold greater confidence in their judgments of truth when compared with their lie judgments.

Method

Participants

The total number of participants in this study was 224. There were two levels of age (old and young), two levels of context (prison and nonprison), and two levels of gender (male and female) designated as factors in the experiment. Participants interacted in same-gender dyads in their respective contexts, and within each dyad, there was a speaker and a judge. One hundred and twelve younger participants were speakers, 56 older participants were judges (28 prisoner and 28 nonprisoner judges), and 56 younger participants were judges (28 prisoner and 28 nonprisoner judges). The participants of interest were judges ($N = 112$), who interacted with speakers six times over the course of each experiment ($N = 672$ total judgments). Equal numbers of male and female participants and equal numbers of prisoners and nonprisoners participated.

A large effect of context on decision-making bias was obtained in a previous experiment with young adult prisoners and nonprisoners (G. D. Bond et al., 2004); therefore, a power of .80 and a large effect size ($ES = .40$) at $p = .05$ was set for this experiment. Fourteen participants were used in each of eight groups needed for a $2 \times 2 \times 2$ factorial design to achieve set power and effect size (Cohen, 1992), given that analyses of variance (ANOVAs) would be used to analyze detection discriminability, criterion, bias, and accuracy values. Speakers are not included in the effect-size calculations, because judges' detection behaviors are the focus of this study.

Older adults were ages 62–84 ($M = 66$, $SD = 5.5$). Younger adults ranged in age from 18 to 35 ($M = 25$, $SD = 6.0$). Ethnicities of younger and older groups were 44.6% White, 37.1% Hispanic, 13.8% African American, 4.0% Native American, and 0.4% Asian American. Prisoners signed up to participate in the experiment with staff members assigned to their units (e.g., classification officers or correctional officers). Flyers were circulated and posted in prisoner common areas for several days before experiments were run. Male prisoners participated from Lansing Correctional Facility (LCF) in Lansing, Kansas; from Southern New Mexico Correctional Facility (SNMCF) in Las Cruces, New Mexico; and from Central Mississippi Correctional Facility (CMCF) in Pearl, Mississippi. Female prisoners participated from Topeka Correctional Facility (TCF) in

Topeka, Kansas; from a women's unit at CMCF in Pearl, Mississippi; and from the New Mexico Women's Correctional Facility (NMWCF-CCA) in Grants, New Mexico. A greater number of older male prisoners were from the Kansas facility, and a greater number of older female prisoners came from the Mississippi facility. Facilities in New Mexico and Topeka held very few prisoners ages 62 and older, whereas the Lansing and Pearl facilities held higher numbers of older prisoners—hence, the disproportionate sampling of age groups. Prisoners had served at least 3 months and had no opportunity to leave prison for work or for other reasons. Total sentence length, without good behavior time, ranged from 0.75 years to life (coded as 99 years), with a median of 6 years. Time served on a sentence at time of participation ranged from 0.25 to 29 years, showing a median of 2 years. There were no significant differences in time served between younger and older prisoner groups or between male and female prisoners in analyses using independent samples t tests (all ps $> .05$).

Younger adult male and female nonprisoners taking psychology courses at New Mexico State University signed up to participate. Older adults from the greater Las Cruces, New Mexico, and El Paso, Texas, communities were recruited from a seniors' organization and from flyer advertisements distributed in the communities.

Prisoners from each New Mexico prison were compensated with a pizza party after participating. In Kansas and in Mississippi institutions, direct compensation for participation was not allowed, so textbooks and adult basic education materials approximating the value of a pizza party were donated to the respective institutional libraries on behalf of the prisoners who participated at those institutions. Younger nonprisoners received partial or extra course credit, and older nonprisoners were offered $10 to participate.

Stimuli Presentation and Interactions

The speaker in each dyad watched eyewitness stimuli segments while segregated from the judge. After watching each video segment, the speaker was instructed as follows:

> You will be watching a total of six videos during the experiment, and this was the [first, and so forth]. You will choose whether you want to tell a lie or tell the truth to the other participant about what you have just seen. If you choose to lie, you need to be as convincing as you possibly can. If you lie, do not just change little facts about what you have seen; you must tell a complete lie. You will tell a total of three lies and three truths, in any presentation order that you choose, over the entire experiment. You have told a total of ____ lies and ____ truths so far. I will give you 30 s to think about what you will say before I bring you back into the area with the judge.

Thus, the first video segment was viewed, and the speaker presented either a lie or a truth (his or her choice) to the judge. The speaker was able to choose the order of presentation of lies and truth, representing truer-to-life choices that humans make about veracity in their conversations. There were no significant differences found in the sequence of presentation of lies and truths or differences in lying or telling the truth about certain videos. The judge and speaker sat face to face, with an approximate 12-in. (30.48-cm) space separation between chairs. Before the interaction, judges were told to listen closely to the presentation and to not say anything. At the end of the first interaction, the speaker left the interaction area and the judge was asked six questions, with the following two questions embedded: (a) Was the speaker truthful or not truthful when s/he spoke? (b) On a scale from 1 to 5, how sure are you that the speaker was (truthful/not truthful), with 1 being *not sure at all*, and 5 being *completely sure*? The other four questions were as follows: (c) Did you understand the speaker's presentation? (d) Was the speaker confident when he or she presented his or her message? (e) Rate the confidence of the speaker on a scale from 1 to 5, 1 being *not at all confident* and 5 being *completely confident*; and (f) what made you come to your decision that the speaker was either lying or telling the truth to you?

Judges did not know the number of lies or truths that would be told in the six interactions, although the base rate was three lies and three truths. Outside of the experimental area, the speaker was asked whether he or she lied or told the truth. The same procedure was followed for each of the interactions, in which the speaker would watch a video, choose to lie or tell the truth, present the message to the judge, and exit the room, where judge and speaker were separately asked questions about the interaction.

Materials and Apparatus

A multitrack recorder (Fostex Model X-12; Foster Electric, Los Angeles) was used to audiotape interactions. Videotaping was not permitted in prison facilities. All participants in both contexts wore headsets, which were combination headphone–microphones. Headsets were connected to a powered six-channel microphone mixer, which connected to the recording device. Headset volume was set at a high level for all participants so that older adults were not at a disadvantage in processing speech. A 15-in. (38.1-cm) color TV and a videotape player were used to present stimuli.

Stimuli for eyewitness recollections and lies consisted of six 3-min video segments. Three crime-related and three neutral segments were presented, in order to balance participants' context-based familiarity with the topics. Balancing the two types of scenarios would allow analyses of judgment accuracy, controlling for the potential confound that speakers might be lying or telling the truth more convincingly about subject matter with which they were more familiar (Levine & McCornack, 2001). Three neutral segments were from the *Issues in Journalism* series that described the press's handling of the President William Clinton and Monica Lewinsky news story (Films for the Humanities & Sciences, 1999a) and live TV news (Films for the Humanities & Sciences, 1999b). The crime-related scenarios were about arson and stalking. One scenario from the *Inside the Minds of Criminal Profilers* video depicted a profiling investigator who solved arson crimes (Cosgrove & Meurer, 1992). Two video segments were from *Stalkers: Against the Law*, which depicted a male college student who allegedly stalked a female student, and a segment that described a device to alert police if a stalker came close to his or her victim (CBS News, 1997). Segments were counterbalanced and presented to speakers one at a time prior to each interaction. Judgments in neutral and crime-related conditions were compared in order to ensure that judges' biases and accuracy in each of the contexts were not influenced by the type of segment shown, and results of t tests were nonsignificant.

Design and Procedure

The main purpose of this study was to simulate the process of younger adults acting as perpetrators of deception on older adults. Younger adults in same-generational dyads were randomly assigned to the speaker or judge role by drawing playing cards. Older adults were always assigned to the judge role, and the younger adult was always assigned as speaker in cross-generational groups. Older adults' and younger adults' names were accessed in random orders from two sign-up lists before they participated.

One of our design priorities was to make this experiment as ecologically valid as possible; hence, there was a different speaker in each of the interactions. A confederate speaker was not used across all interactions because that speaker's lie and truth telling might have improved across the large number of presentations, and discriminability by the judges who participated later in the research probably would have been diminished owing to that confound. Thus, a planned control condition was installed in the research to control for the possibility that there might be differences in the way the several speakers lied and told the truth. Digital audio presentations of same-context, same-gender messages were played to the same judges who had participated in interactions as judges. The base rate of presentations was two lies and two truths, and judges answered the same

questions about the statements that they heard during standardized presentations as they did after interactions. If judges' detection in the standardized procedure was not significantly different from detection in interactions, then this result would confirm that speakers in the interactions were lying and telling the truth with roughly the same ability as speakers on the standardized presentations and that judges were not changing their bias, discriminability, and accuracy across conditions. Two cognitive measures from the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1981), the Digit Span and Vocabulary subscales, were administered to judges while they waited for speakers to view the video stimuli.

Experiments were conducted in one room and an exterior corridor or adjoining small room at each of the prison facilities and at New Mexico State University. Visiting rooms and exterior corridors or adjoining small rooms were used in the prisons, whereas a large laboratory room and an adjoining room were used at the university. Two experimenters conducted experiments at prison facilities, and two experimenters conducted experiments at the university. Experiments lasted approximately 1.5 hr. In the prison context, correctional officers or other staff members were stationed in control centers near the experimental areas, available for any possible security problems. One experimenter read the consent form to participants, because individual literacy levels of prisoners and older participants were unknown. A demographics questionnaire was administered to all participants in both contexts that garnered information about age, years of education, ethnicity, charge, length of prison term served and length of total prison term (for prisoners), the number of visits received, number of phone calls, and amount of personal mail received in the last month.

Dispositional Suspicion and Trust Measures

Participants were given a Generalized Communication Suspicion Scale (GCS; Levine & McCornack, 1991) and an Interpersonal Trust Scale (ITS; Rotter, 1967). *Generalized communication suspicion* has been defined as a relatively enduring, stable predisposition to suspect deception by others during communicative discourse. Reliability (α = .75) of the GCS has been established previously with college students (Levine & McCornack, 1991). An experimenter read scale statements to participants, who answered on a 7-point scale that ranged from *strongly disagree* to *strongly agree*. The ITS (Rotter, 1967) was implemented here with the GCS as a dependent variable as well, because GCS and ITS are highly correlated (Levine & McCornack, 1991). Those researchers found a correlation between GCS and ITS of $r(157) = -.58$. Low interpersonal trust, as characterized by Levine and McCornack (1991) and by Deutsch (1958), is not indicative of a suspicious nature but simply shows a lack of trust. Trust is a belief that another will "behave in a benevolent and desired fashion [while] suspicion involves the belief that another may behave in a negative and malevolent fashion" (Levine & McCornack, 1991, p. 326). Thus, trust is a belief that others will exhibit positive behaviors (e.g., being truthful), whereas suspicion is a belief that others might exhibit negative behaviors (possibly deceptive behaviors). The ITS has been validated previously with college students, where internal consistency of the scale was found to be .76 (Rotter, 1967, 1971).

Manipulation Check for Speakers' Presentation Consistency and for Judges' Decision-Making Consistency

Because judges did not receive a standardized presentation of lies and truths produced by a single speaker in the interactive phase of the experiment, it was necessary to compare judges' decision making in face-to-face interactions with decision making in standardized audio presentations. This would ensure that judges were consistent in their decisions without regard to the stimuli presented. In noninteractive designs, a single speaker might be presented by means of videotape or audiotape to judges; however, the objective of this research was to incorporate an interactive design, with a different speaker for each judge, even though we controlled for any potential probing effect by ensuring that judges did not converse with speakers (Levine & McCornack, 2001). Stimuli were recorded on compact discs from audiotapes of selected prisoner interactions from a previous experiment with prisoners (G. D. Bond et al., 2004) and from pilot studies with prisoners and with nonprisoners. Consent was obtained from all participants to use their recorded voices in a subsequent experiment. The final messages to be presented to detectors were chosen from 140 messages. Four researchers separately coded the statements on scales from 1–5 for truthfulness and deceptiveness. As a group, the researchers decided which of the truth and lie messages were to be presented. Prisoner judges in this study listened to two truths and two lies produced by other same-gender prisoners. Nonprisoner judges heard two truthful messages and two lie messages produced by other nonprisoners of the same gender. Message veracity was counterbalanced, and participants always participated in this procedure after the interactive part of the experiment was completed. An answer sheet was given to judges, with the same six questions asked of judges in interactions, with the embedded question about speaker honesty and a confidence rating for each statement. Judges were instructed to listen to the four statements, and after each, they were to answer the questions on their answer sheets while the compact disc player was paused. The compact disc player's volume was set at a loud level, and participants sat approximately 12 in. (30.48 cm) from the device. After the experiment, participants were verbally debriefed.

Results

Digit Span and Vocabulary Measures

Young nonprisoners reported a mean of 13.01 years of education (SE = .16), and older nonprisoners averaged 14.54 years of education (SE = 0.41). Young prisoners reported a mean of 11.52 years of education (SE = 0.33), and older prisoners had 11.07 years of education (SE = .64). There were no significant differences found within contexts in years of education across geographical regions, although there was an expected difference in years of education between context groups, $F(1, 222) = 37.66$, $p = .01$, $\eta^2 = .15$.

Participants were compared on cognitive measures while we controlled for levels of education. WAIS (Wechsler, 1981) Digit Span and Vocabulary subscale scores served as dependent measures in a 2 (age: young, old) × 2 (gender: male, female) × 2 (context: nonprison, prison) factor multivariate analysis of variance (MANOVA). Years of education was entered as a covariate in the analysis. A main effect of age was discovered, in which older adults (M = 11.32, SD = 4.5) scored significantly lower than younger adults (M = 13.27, SD = 3.9) on the Digit Span subscale, $F(1, 103) = 9.95$, $p = .01$, $\eta^2 = .07$. A significant interaction of Age × Gender was obtained for Vocabulary scores, $F(1, 103) = 5.50$, $p = .02$, $\eta^2 = .03$. An independent samples t test revealed that younger male participants (M = 42.92, SD = 12.6) scored higher than younger female participants (M = 34.21, SD = 11.2), $t(54) = 2.74$, $p = .01$, $d = 0.73$, on the Vocabulary subscale. No differences were found between older male and female participants on either the Digit Span or the Vocabulary subscales. All of the effects of context were nonsignificant.

Signal-Detection Theory Analysis

Signal-detection theory analysis (Green & Swets, 1966) was performed on detection data. Signal-detection theory is primarily used in perceptual studies, for example, when individuals make

visual or auditory judgments, but signal-detection theory is also applied to decision-making processes when ambiguities are present (Wickens, 2002). The current analysis is applied to lie and truth judgments in a series of simple binary yes–no experiments (Hartmann, 1998). Lies represent signal and noise present (*SN*; signal present in Gaussian noise), whereas truths represent noise alone (*N*). Discriminability, or sensitivity to the signal embedded in the noise, was analyzed first. Discriminability (d') is estimated by subtracting Z_{hits} from the $Z_{\text{false alarms}}$ and is a measure that corrects for response bias and for guessing. The normalized deviate, Z_{hits}, represents the number of lie decisions that were made when lies were presented by speakers. The $Z_{\text{false alarms}}$, which is the normalized deviate for the false-alarm rate, represents the number of lie decisions made when truth statements were presented. Hits, misses, false alarms, and correct rejections are shown for all groups in Table 1. The criterion, or β, is the minimum threshold past which detectors say that there is a signal present in the noise and is analyzed in the criterion analysis section following the discriminability section below. Criterion is calculated as the ordinate of hits divided by the ordinate of false alarms (Hochhaus, 1972).

Lie Discriminability Analysis

To measure lie discriminability, we estimated values of d′ for each participant in each of the eight participant groups. An Age × Gender × Context ANOVA was conducted with d′ as the dependent variable. Main effects were discovered for age, $F(1, 104) = 5.00$, $p = .03$, $\eta^2 = .04$, and for context, $F(1, 104) = 6.47$, $p = .01$, $\eta^2 = .05$, but not for gender, $F(1, 104) = 3.73$, *ns*. Older adults as a collapsed age group showed greater discriminability of lie messages ($d'_{\text{older}} = 1.12$, $SE = 0.27$, and $d'_{\text{younger}} = 0.27$, $SE = 0.27$). Prisoners were most sensitive to lie messages ($d'_{\text{prisoner}} = 1.18$, $SE = 0.27$, and $d'_{\text{nonprisoner}} = 0.22$, $SE = 0.27$). An Age × Gender interaction, $F(1, 104) = 4.61$, $p = .03$, $\eta^2 = .04$, showed that male participants held a similar rate of discriminability from younger to older age ($d'_{\text{younger male}} = 0.31$, $SE = 0.38$, and $d'_{\text{older male}} = 0.35$, $SE = 0.38$, respectively), whereas discriminability increased substantially from younger to older age in the female groups ($d'_{\text{younger female}} = 0.31$, $SE = 0.38$, and $d'_{\text{older female}} = 1.89$, $SE = 0.38$). Figure 1 presents the Age × Gender interaction. Comparisons were performed with Bonferroni adjustments to investigate differences in d′ between gender and context groups. Older and younger prisoners did not differ in discriminability; however, older adult nonprisoners ($M = 0.92$, $SE = 0.38$) held greater discriminability when compared with younger nonprisoners ($M = -0.48$, $SE = 0.38$), $t(108) = 2.57$, $p = .01$, $d = .73$.

Table 1
Hits, Misses, False Alarms, and Correct Rejections in Interactions by Group

Group	Hits	Misses	False alarms	Correct rejections
Younger adults				
Female				
Nonprisoner	.19	.81	.26	.74
Prisoner	.67	.33	.55	.45
Male				
Nonprisoner	.12	.88	.19	.81
Prisoner	.69	.31	.50	.50
Older adults				
Female				
Nonprisoner	.43	.57	.17	.83
Prisoner	.52	.48	.12	.88
Male				
Nonprisoner	.33	.67	.33	.67
Prisoner	.40	.60	.31	.69

Criterion Analyses

Detector biases were examined to determine the threshold at which each group set a mean criterion for affirming (saying "yes") that a signal (lie) was detected. An ANOVA was conducted with age, gender, and context as factors and criterion (β) as the dependent variable. Main effects were found for age, $F(1, 104) = 8.65$, $p = .01$, $\eta^2 = .06$, and for context, $F(1, 104) = 5.71$, $p = .02$, $\eta^2 = .04$. Gender was nonsignificant. Interactions of Age × Gender, $F(1, 104) = 6.28$, $p = .01$, $\eta^2 = .05$, and Age × Context, $F(1, 104) = 7.98$, $p = .01$, $\eta^2 = .06$, were found. Means for the age groups indicated that older adults set a more conservative criterion for judging lies than did younger adults ($\beta_{\text{younger}} = 0.79$, $SE = 0.21$; $\beta_{\text{older}} = 1.64$, $SE = 0.21$), and context averages showed that nonprisoners set a more conservative criterion for judging lies than prisoners ($\beta_{\text{nonprisoner}} = 1.56$, $SE = 0.21$; $\beta_{\text{prisoner}} = 0.87$, $SE = 0.21$). The Age × Context interaction, depicted in Figure 2, represents the younger prisoners' comparatively liberal criterion value ($\beta = 0.03$) crossing to the older prisoners' conservative criterion ($\beta = 1.70$), in comparison to a stable, conservative criterion set by younger ($\beta = 1.54$) and older ($\beta = 1.58$) nonprisoners.

Veracity and Reversed Veracity Effects

Correlation analyses were conducted in an attempt to replicate findings by Levine et al. (1999) and by G. D. Bond et al. (in press) that truth-biased groups (both nonprisoner and prisoner) evidence a veracity effect, because those groups show greater truth bias and truth accuracy, whereas lie detection accuracy was below chance. Truth bias and truth detection accuracy were highly positively correlated, $r(84) = .68$, $p = .01$; there was a strong negative correlation found for truth bias and lie detection accuracy, $r(84) = -.79$, $p = .01$; and a large effect was shown ($\eta^2 = .54$), suggesting that a veracity effect was shown, even with older prisoners as participants. G. D. Bond et al. (in press) also found that lie-biased prisoners show a reversed veracity effect, because those groups show greater lie bias and lie detection accuracy, whereas truth detection accuracy is below chance. Lie bias and lie detection accuracy were highly positively correlated in this study, $r(28) = .77$, $p = .01$; lie bias and truth detection accuracy were highly negatively correlated, $r(28) = -.79$, $p = .01$; and a large effect was shown ($\eta^2 = .61$), suggesting a reversed veracity effect, discovered by G. D. Bond et al. (in press) in a previous study conducted with younger prisoners. Figure 3 generally depicts

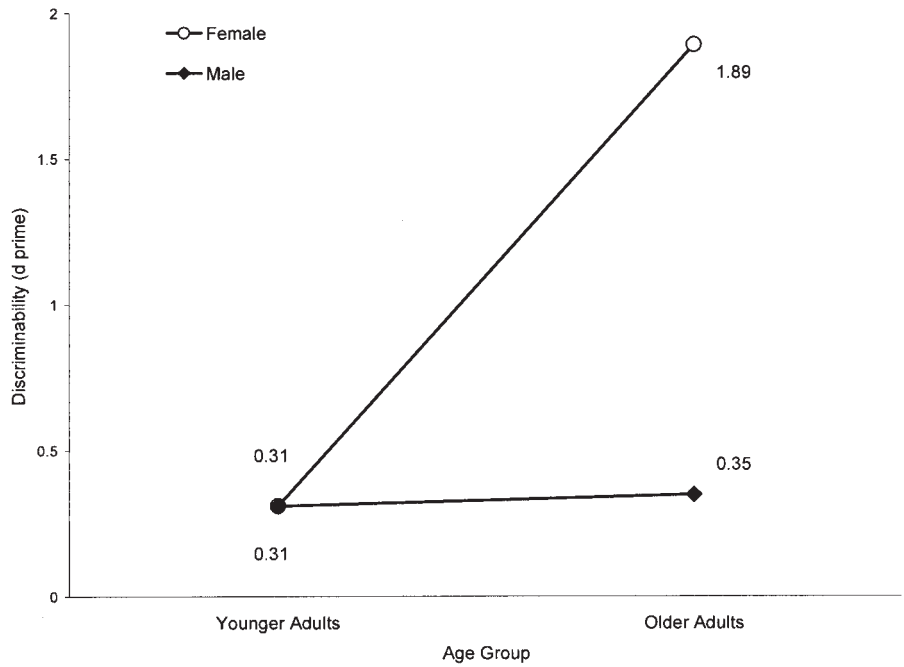

Figure 1. Age × Gender interaction; lie discriminability (d') in interactive detection.

younger and older adult prisoners' and nonprisoners' lie bias in interactions.

Length of Time Served and Lie Bias

Length of time served in the prison context might influence lie bias, if a context effects explanation is true. Therefore, younger adult prisoners, being lie biased, should not show a decrease in lie bias as time served increases but should show consistent levels of lie bias or increases in lie bias with time served. Older adult prisoners show a truth bias, so length of time served in the prison context should relate to no effect on lie bias or might relate to a decrease in lie bias. A simple regression analysis was conducted with length of time served regressed on lie bias, with all prisoners

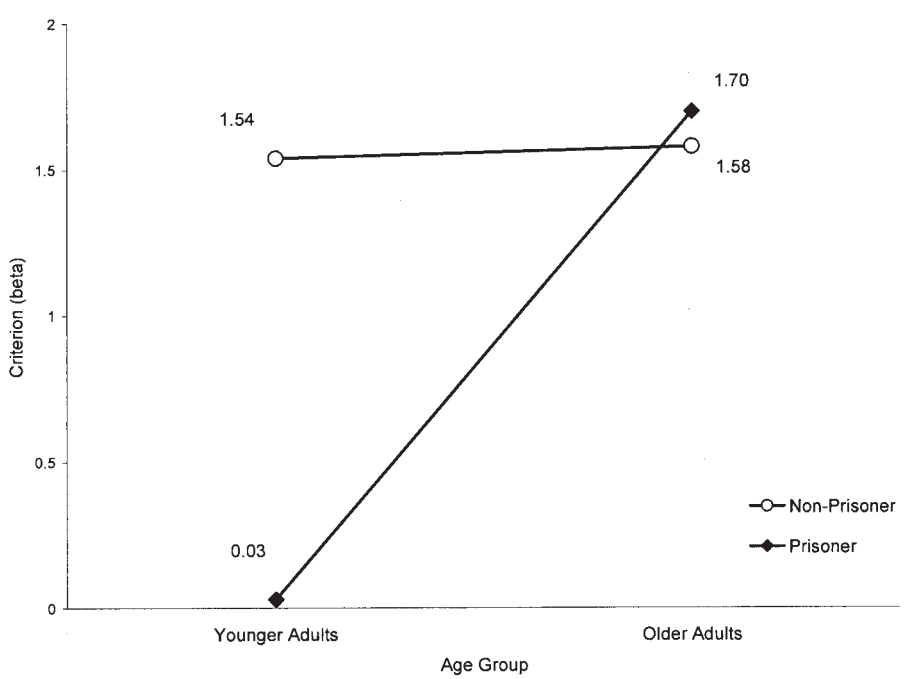

Figure 2. Interaction of Age × Context on criterion (β) values in interactive detection.

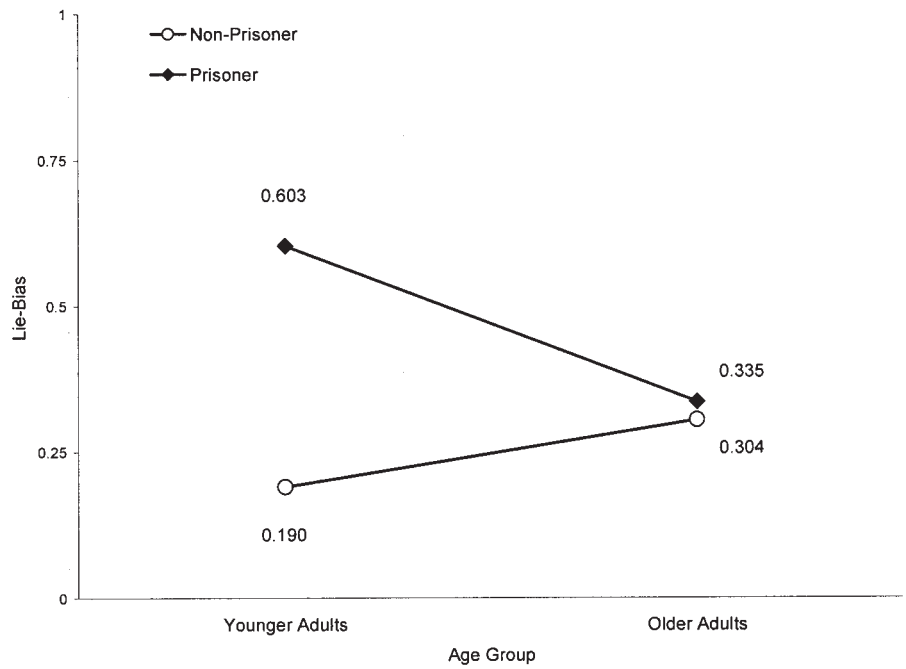

Figure 3. Lie bias in interactions; Age Group × Context Group.

from both age groups included in a preliminary analysis. The beta coefficient for time served regressed on lie bias was negative, $\beta = -0.31$, indicating that lie bias decreased as time in the prison context increased. Next, the two age groups were analyzed separately with time served regressed on lie bias, in order to discover whether younger, older, or both groups showed results that were consistent with a context effects explanation. Younger prisoners exhibited a consistent lie bias as time served increased, $\beta = -0.13$, $F(1, 26) = 0.45$, $p = .51$, *ns*, but older prisoners exhibited a decrease in lie bias as time served increased, $\beta = -0.39$, $F(1, 26) = 4.59$, $p = .04$.

Postdecisional Confidence

Confidence in making a judgment of lie or truth after each interaction was given on a 5-point scale, with 1 representing the least confidence in the decision. Every group, prisoner and nonprisoner, showed significantly higher confidence in making truthful judgments when confidence was analyzed using *t* tests.

Dispositional Measures of Suspicion and Trust

Reliability of the GCS was $\alpha = .76$ after three GCS items were removed from the original 14 scale items. Nine of 25 items from the ITS were removed, and reliability was $\alpha = .70$. GCS and ITS scores were examined using a MANOVA with Age × Gender × Context entered as factors. An overall main effect of context was found on GCS and ITS, $F(1, 216) = 18.58$, $p = .01$, $\eta^2 = .08$, and Context × ITS showed $F(1, 216) = 19.76$, $p = .01$, $\eta^2 = .08$. Investigation of the means showed that prisoners ($M = 52.23$, $SE = 1.1$) held greater suspicion than nonprisoners ($M = 45.82$, $SE = 1.1$), and prisoners ($M = 75.43$, $SE = 1.4$) were less trusting than nonprisoners ($M = 82.60$, $SE = 1.1$). There were no differences found for age or gender on GCS or ITS scores.

GCS Predicting Lie Bias in Interactions

Persons who exhibited higher GCS scores might be lie biased because of their higher dispositional suspicion (McCornack & Levine, 1990) rather than because of a context effects explanation. Earlier, results showed that in the prison context, GCS scores were significantly higher. A simple regression analysis was conducted using GCS scores as the predictor of lie-bias percentages, and the regression showed a poor model fit ($R = .006$) and the overall relationship was not significant, $F(1, 110) = .004$, $p = .95$, *ns*. Thus, individuals who scored higher on the suspicion measure did not predict their groups' lie bias, and so dispositional suspicion was ruled out as an alternative explanation to a context effect on decision making.

Discriminability and Criterion in Standardized Presentations

It was predicted that discriminability in interpersonal interactions would not be different from discriminability in standardized audiotaped presentations. Statistical *t* tests confirmed the prediction, $t(111) = 0.48$, $p = .63$, *ns*, indicating that judges held the same levels of discriminability across both detection conditions. Table 2 shows d′ means in interactions and in standardized presentation conditions.

Criterion was compared for judges between interaction decisions and standardized decisions. A *t* test revealed no differences between the two conditions in criterion set, $t(111) = -0.84$, $p = .40$, *ns*. Because there were no differences in discriminability and

Table 2
Discriminability Results in Interactions and Standardized Presentations by Group

Group	Interactions *M*	Interactions *SE*	Standardized presentations *M*	Standardized presentations *SE*
Younger adults				
Female				
Nonprisoner	−0.46	.54	−0.66	.75
Prisoner	1.07	.54	1.10	.75
Male				
Nonprisoner	−0.51	.54	−0.44	.75
Prisoner	1.13	.54	1.32	.75
Older adults				
Female				
Nonprisoner	1.62	.54	1.55	.75
Prisoner	2.16	.54	2.21	.75
Male				
Nonprisoner	0.21	.54	0.66	.75
Prisoner	0.48	.54	0.88	.75

Note. Detection decisions were made over six interactions and over four standardized presentations.

criterion between the interactions and the standardized presentations, speakers in interactions were comparable to speakers who would be presented on audiotape or videotape to detectors.

Discussion

This was the first study empirically designed to answer the question of whether members of older age groups are more vulnerable to deception than other groups. This was also the first study that specifically assessed older prisoners' deception detection biases and decision-making abilities. Results indicate that the vulnerability to deception so closely associated with older adults in media reports was not shown in this research with two very different populations of older nonprisoners and older prisoners. Older adults were, in fact, better able to discriminate lies than younger adults, and this effect was localized primarily to older female adults. This is a surprising finding, given the popular belief that older adults are overly trusting and vulnerable to deception. Findings indicate that discriminability strongly increases from younger to older age for women, whereas men do not show such an improvement over the life span in making decisions about statement veracity.

Further, older adults in prison and nonprison contexts do not differ from younger nonprisoners in their truth bias nor in their criterion setting when judging deceptive communication. Only the younger prisoners are lie-biased, probably because of the unusual effects of the social and cultural context in which they live. Prison is a context in which wariness is the order of the day, lie bias is high, and a reversed veracity effect is exhibited by younger prisoners (G. D. Bond et al., in press). The interaction of state and dispositional suspicion is such that younger prisoners show those context effects in their decision making.

Older adults in both contexts were better able to tell lies from truths than younger adults. Hess (1994) acknowledged that although older adults exhibit decrements in cognitive processing, such as in working memory capacity, their experience and knowledge base is advantageous when engaging in social interactions. Through their accumulated experience with social others in various situations, older adults are able to construct well-elaborated theories of trait-behavior relations, which in turn enhance the accuracy of their interpretations of the behavior of others (Hess, 1994, p. 241).

Older adults' predominant reliance on heuristics to solve problems and make decisions (Klaczynski & Robinson, 2000) about the veracity of statements made by social others is, when combined with Hess's (1994) argument, an efficient deception detection strategy. If heuristics are based on the accumulated experience of detecting truth and deception with many social others over the life span, and feedback has increased accuracy in detecting deception, then this adaptive strategy lends itself to increased discriminability of statements that are ill defined in terms of veracity. This experience seems to transcend contexts, where older prisoners show good discriminability of truth and lie statements.

If any age- and context-based group might be characterized as vulnerable, that vulnerability would lie in the group of younger adult nonprisoners that have been studied in such great detail over many deception detection studies. Deception researchers confirm that detection accuracy (averaged truth and lie detection) over most studies performed primarily with young college students is close to chance (DePaulo, Kirkendol, Tang, & O'Brien, 1988; DePaulo & Pfeifer, 1986; DePaulo, Zuckerman, & Rosenthal, 1980; Kraut, 1980; Miller & Stiff, 1993; Stiff & Miller, 1986). Further, Levine et al. (1999) indicated that those "chance" detection averages can be decomposed into averages of above-chance truth detection (75–82%) and below-chance lie detection (31–39%) in their study and that those rates are replicated consistently across deception detection studies. Results in this research show that younger nonprisoners exhibit a veracity effect when judging the communication of others (Levine et al., 1999), and the veracity effect was replicated in this study with younger nonprisoners as well as with older prisoners and nonprisoners.

Because the two context-based younger adult groups were not similar in their biases, the effects of social and cultural context afford reasons why prisoners are lie biased and nonprisoners are truth biased. In a pilot study conducted by G. D. Bond et al. (in press), two levels of prison custody (medium custody prisoners, who never left the prison, and minimum custody prisoners, who were able to work in the community) were very different in their biases. If prisoners were permitted some contact with the outside world, they were truth biased in their decisions, whereas those prisoners who could not leave the prison context were lie biased. The prisoners had transferred between levels of custody (medium to minimum and minimum to medium), and so their original custody classifications did not affect their biases, but context did. The same context-based effect that was shown by prisoners who had no "outside" exposure to the free world was replicated in this research with younger prisoners.

Time served in prison actually predicted a decrease in lie bias for older prisoners, whereas younger prisoners exhibited a consistent level of lie bias without any effect of length of incarceration. This result indicates that the social and cultural context of prison

consistently affects the decision-making biases of younger prisoners; however, older prisoners, in their decisions about statement veracity, reflect their nonprison cohort's patterns of decision making and biases independent of context. Those differential effects of context point toward a developmental decision-making trajectory for older adults, given that in prison, older prisoners are truth biased and set a conservative criterion for judging lies, much like their nonprison counterparts. Further, lower scores on GCS and higher scores on ITS indicate that older prisoners are less suspicious and more trusting of others, like their nonprison counterparts.

The confidence results show that the detection of truths and lies, opposite sides of the same coin, is an effortful process and that all detectors in this study, even younger prisoners who are lie biased, are significantly more confident when making truth decisions.

Criterion results from the signal-detection theory analyses were as expected. Young prisoners set a liberal criterion past which detectors would say, "a lie is present," in stark contrast to detectors in all other groups, who set much more conservative levels of beta. This result shows that younger prison prisoners shift their criterion to a more liberal one, probably in response to affordances in the context (e.g., context markers; Bateson, 1973).

This was a field experiment and, as such, placed limits on the amount of experimental control that a researcher would normally exercise in a laboratory setting. The experimental design controlled for as many variables as possible with groups already in place in their respective contexts. One problem inherent in assessing bias and accuracy in decision making with numerous speakers in many dyads, rather than a single or small number of speakers across all judges, is that some speakers might be very good liars or truth tellers, and some might not be. Therefore, to control for this potential confound, we installed a mechanism in the study design to ensure that interactive speakers were qualitatively the same as speakers who were prerecorded and presented to judges. This research was designed so that interactions within dyads could be undertaken, rather than offering artificial standardized presentations to individuals to assess bias and accuracy in their decisions, chiefly to increase the external validity of the experiment. The use of a confederate to lie and tell the truth to judges in this research was contemplated, but the possibility that a confederate might become a better liar and truth teller over time, confounding detection results, discouraged the researchers from incorporating such a design. The decision to include interactivity was based on previous researchers' assertions that interactions offer greater external validity, and further, that results from interactive experiments are not comparable to noninteractive manipulations (Buller & Hunsaker, 1995; Buller, Stiff, & Burgoon, 1996; Burgoon & Buller, 1994). Interactive behaviors are thought to be characterized by moderate arousal, high immediacy, and positive affect, whereas behaviors in noninteractive experiments are characterized by nonimmediacy, high arousal, and negative affect (Buller et al., 1996). However, there were no differences found in this research to suggest that bias, discriminability, or accuracy were different between interactive and standardized conditions. This finding lends support to those who argue that standardized presentations are comparable to interactive manipulations (Levine & McCornack, 1996).

Results indicate that, contrary to popular belief, older adults and especially older women are not more vulnerable to con artists than are members of any other age group. However, this finding should not diminish efforts by groups such as the American Association of Retired Persons to inform the public about identity theft, telemarketing scams, and other fraudulent practices that are perpetrated against older adults and other groups. Individuals of all ages should be informed about and protected from those who seek to defraud or to harm them through deceptive means.

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