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Preliminary Examination of Methods for Identifying the Function of Stealing

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PRELIMINARY EXAMINATION OF METHODS FOR IDENTIFYING THE FUNCTION OF STEALING

by

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Because low rate, covert responses are hard to observe and measure (e.g., Azrin & Wesolowski, 1974; Henderson, 1981; Jeffery, 1969; Reid & Patterson, 1976; Seymour & Epston, 1989), well-controlled behavior analytic investigations of stealing have been rare. In fact, systematic investigations to experimentally determine stealing functions have been limited to two studies targeting food (Lambert et al., 2019; Simmons, Akers, & Fisher, 2019). The dearth of studies examining stealing functions, partly attributable to low rate and covertness, may be forestalling additional intervention studies. Given the likely futility of unsystematic attempts to observe naturally occurring instances of an infrequent, clandestine response, a possible role for indirect assessment emerges (Iwata & Dozier, 2008). This two-part study concerned an investigation into the reliability and predictive validity of the Functional Analysis Screening Tool (Iwata, DeLeon, & Roscoe, 2013) and a similarly constructed tool (The Stealing Inventory or TSI) with the latter having questions oriented towards likely stealing functions. In doing so, the comparative viability of two trial-based functional analysis (FA) models (Bloom, Iwata, Fritz, Roscoe, & Carreau, 2011; Lambert, Bloom, & Irvin, 2012) was also examined. Across 42 respondent pairs, overall tool reliability and outcome reliability for suggested functions favored the TSI (85% and 92.9%, respectively) over the FAST (80% and 73.8%, respectively). Three out of 6 participants stole during one of their two respective FAs, and the identified function matched the respective TSI outcomes for each case. FA model superiority was unclear.

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INTRODUCTION

Stealing has been characterized as "…a problem of social importance in its own right" (Belson, 1975, p. 3) and has considerable detrimental economic and societal impacts (Castiglia, 1999). Of the approximately 7,196,045 crimes against property in the U.S. reported by the Federal Bureau of Investigation - Uniform Crime Reporting Program (2019), larceny-theft, defined as "…unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another" in the absence of force or threats of force against the victim, comprised 5,217,055 (72.5%) of these crimes in 2018.

The estimated national loss to victims of larceny-theft in 2018 was about $6 billion for a per-offense value of $1,153. Because a hierarchical approach was followed in which only the most serious crime (in cases involving multiple offenses) was considered for data analysis, frequency and loss associated with property crimes are underestimates. Of the total larceny-thefts in 2018, theft from motor vehicles not including accessories (27%) was most common followed by shoplifting (21.3%) with average values being $994 and $304, respectively. The costliest larceny-thefts per offense (on average) occurred from unspecified buildings ($1,610). While 46.7% of larceny-thefts involved values over $200, a sizeable 31.8% of thefts involved values under $50. Of the $4.12 billion in recovered (stolen) property in 2018, locally stolen motor vehicles (59.3%) accounted for the largest value followed by firearms (11.1%), livestock (9.6%), and clothing/furs (7.9%). Currency, notes (etc.) accounted for the smallest value of recovered goods at 2%. With respect to shoplifting, consumers bear the burden of shoplifting costs to stores when prices are adjusted upwards due to anticipatory stock "shrinkage" (Korgaonkar, Gironda, Petrescu, Krishen, & Mangleburg, 2019; Potdar, Guthrie, & Gnoth,

2018). Further, qualitative degradation in the shopping experience may result from expensive prevention efforts that are intrusive (surveillance) or slow the process (locked or otherwise secured merchandise or physical barriers) (Carmel-Gilfilen, 2011; Cox, Cox, & Moschis, 1990; Tonglet, 2000).

The incidence and lifetime prevalence of stealing is considered high (Grant, Odlaug, & Donahue, 2012[a]; Grant, Odlaug, Lust, & Christenson, 2016; Klein, 1986; Seymour & Epston, 1989). In one frequently cited study, Belson (1975) reported that, in their random sample of 1,425 boys (ages 13-16) drawn from the general population of London, all of the boys admitted to engaging in at least some degree of theft and 50% reported never having been caught. Slocum and Stone (1963) obtained anonymously completed questionnaires from 3,242 public high school students (1,674 boys and 1,568 girls) in Washington. Although about 6% of the completed questionnaires were not included in the data analysis due to concerns regarding response veracity and question comprehension, the authors reported that 50% of the boys and 32% of the girls admitted stealing from others at least once or twice since grade school with fewer respondents admitting to several thefts (boys= 11%; girls= 4%) and still fewer admitting more than several thefts (boys= 2%; girls= 1%). More recently, Grant, Potenza, Krishnan-Sarin, Cavallo, and Desai (2011) found an overall stealing prevalence of 15.2% in a self-report sample of 3,999 high school students. Population-level estimates of shoplifting have been reported at 11.3% for adults and 15% for adolescents (Blanco et al., 2008), and one out of 11 consumers are thought to be shoplifters according to the National Association for Shoplifting Prevention (2019). These estimates notwithstanding, various factors impede ascertaining the full scope of the stealing problem. Official criminal statistics and records often have flaws including disparate agency reporting practices that may have bias, underestimate occurrences, and/or inaccurately reflect

criminal acts (Buckle & Farrington, 1984; Dunford & Elliot, 1984; Farrington, 1973; Farrington, 1979; Farrington, 1999; Hardt & Peterson-Hardt, 1977; Hood & Sparks, 1970; Miller & Klungness, 1989; Miller & Moncher, 1988). For example, in some locations, offenses the occur before age 12 have sometimes been often omitted from official processing (Loeber & Farrington, 1998). Determination of the incidence and prevalence of stealing is perhaps most hindered by its covert nature (i.e. stealing is often undetected), underreporting, and lack of prosecution (Baumer & Rosenbaum, 1984; Belson, 1975; Cameron, 1964; Edelbrock, 1983; Griffin, 1984; Miller & Klungness, 1989; National Association for Shoplifting Prevention, 2019; Shapland, 1978). Some stores have practiced selective surveillance of shoplifting or pursue apprehension in a biased manner such that juveniles with certain characteristics are less likely to be targeted (Baumer & Rosenbaum, 1984; Cameron, 1964; Klemke, 1982; Robin, 1963; Hardt & Hardt, 1977). Loeber, Farrington, and Waschbusch (1998, p. 25) cited Huizinga (1991) in contending that official records represent only the "tip of the iceberg" with respect to actual juvenile offending (not limited to stealing). Problems with relying on official records led some investigators to utilize self-report measures. Hood and Sparks (1970) noted that, based on the results of self-report studies, many individuals engage in delinquent-type behavior (even if usually minor) but have not been formally identified. Hood and Sparks offered several benefits of self-reports including deriving population-level estimates of the number of individuals that engage in unlawful actions and how often they do so, including those that have not been officially adjudicated, and permitting comparisons between individuals considered officially delinquent versus those without such status. As noted by Farrington (1973), while self-reports offered advantages over official records, they had their own drawbacks including the social significance of the acts reported, forgetting of incidents, fabrication, and inaccurate description

of problem severity (e.g., Farrington, 1999; Grant et al., 2016; Hood & Sparks, 1970; Loeber, Farrington, Stouthamer-Loeber, & van Kammen, 1998a). Given the biases of self-reports and other indirect methods (e.g., victim surveys), some researchers advocated for direct observation of behavior as a general strategy for determining the incidence and nature of offending behavior (Buckle & Farrington, 1984; Farrington, 1999), although Farrington (1999) cautioned that direct observation was time consuming and effortful. As noted by Loeber et al. (1998), some investigators settled on combining indirect and direct methods of gathering information.

Although some level of minor stealing is apparently quite common in early childhood and young adults (e.g., Belson, 1975; Grant et al., 2016; Leung, Robson, & Lim, 1992; Loeber, et al., 1998; Patterson, 1982), continuance of this behavior between ages 5-10 with a rate of being caught at least once every 3-4 months has been characterized as problematic (Patterson, 1982). Baruah (1989) advocated for ages 7-8 as the cutoff for problematic stealing. In reviewing cross-cultural, self-report studies, Hood and Sparks (1970) concluded that many children, after ages 4-5, do not suddenly desist stealing, but simply learn to do it without detection. For those individuals that steal persistently, the behavior maintains despite various risks to the perpetrator including caregiver or school-administered punishment, banishment from stores, arrest, etc., perhaps due in part to the low probability of getting caught (e.g., Baumer & Rosenbaum, 1984; Belson, 1975/1976; Griffin, 1984; Hood & Sparks, 1970; Ingamells & Epston, 2013; Shapland, 1978), let alone arrested and convicted (Akers, 1973; Farrington, 1973; National Association for Shoplifting Prevention, 2019; West & Farrington, 1977). In explaining how theft becomes a persistent part of an individual's repertoire, Akers (1973, p. 197) wrote, "Professional criminals are sometimes caught and punished, but the frequency, probability, and amount of reinforcement for continuation in crime are far greater than this sporadic, uncertain

punishment." Similarly, Bandura and Walters (1959, p. 365) opined, "It is evident that in many cases persistent offenders amass considerable rewards between each punishment that they incur."

Stealing in children and adolescents, when combined with various other deviant topographies (e.g., vandalism, physical aggression, underage drinking, elopement, truancy, and others) is predictive of adult antisocial behavior (Farrington, 2005; Robins, 1978; Robins, 1986; Robins & Ratcliff, 1978) and health and occupational difficulties (Robins, 1986). The significance of persistent stealing is further highlighted by findings from multiple authors reflecting a trajectory of chronic and increasingly more severe crimes committed by some individuals with early-onset delinquent behaviors (including theft) that coincide with other established risk factors (e.g., Farrington, 2003; Huizinga, Weiher, Espiritu, & Esbensen, 2003; Krohn & Thornberry, 2003; Loeber et al., 1998; Tolan & Gorman-Smith, 1998). Others have noted linkages between childhood theft and problems with delinquency, academic performance, and psychopathology (Farrington, 1973; Krohn & Thornberry, 2003; Loeber, 1982; Loeber & Dishion, 1983; Mitchell & Rosa, 1981; Moffitt, Caspi, Harrington, & Milne, 2002; Moncher & Miller, 1999; Robins, 1978). Smoking, use of drugs, aggressive behavior, cognitive difficulties and impulsivity are also associated with stealing (Baylé, Caci, Millet, Richa, & Olié, 2003; Grant et al., 2012a; Grant et al., 2011; Greening, 1997; Patterson, 1982).

Thus, stealing that persists beyond early childhood is problematic and carries potentially significant, adverse long-term implications. Nevertheless, while voluminous material concerning various theories on the origins of crime exists (e.g., Abrahamsen, 1944; Agnew, 2006; Akers, 1973; Akers & Sellers, 2004; Bentham, 1823; Brownfield & Sorenson, 1993; Catalano & Hawkins, 1996; Farrington, 2005; Gottfredson & Hirschi, 1990; Kornhauser, 1978; Merton, 1938; Moffitt, 1993; Sampson & Laub, 1993; Sutherland, 1939/1947) and much attention has

been given to identifying global, perhaps temporally-removed risk factors for delinquent and criminal behavior (e.g., Farrington, 2003; García-Gomis, Villanueva, & Jara, 2017; Glueck & Glueck, 1968; Krohn & Thornberry, 2003; Loeber et al., 1998; McCord & McCord, 1959; Patterson & Loeber, 1981; Tolan & Gorman-Smith, 1998; West & Farrington, 1973) efforts to demonstrate effective, individualized, behavior-analytic interventions (see Baer, Wolf, & Risley, 1968) for preventing and decreasing stealing have been rare[1]. For example, a search on the webpage of the flagship journal for applied behavior analysis (ABA), the *Journal of Applied Behavior Analysis* (*JABA*), completed on July 1st, 2020, using the search term "stealing" for article titles and abstracts from 1968 (the journal's inception) through 2019 yielded only three studies (Azrin & Wesolowski, 1974; Maglieri, DeLeon, Rodriguez-Catter, & Sevin, 2000; Switzer, Deal, & Bailey, 1977). The method sections and graphs of the identified studies were reviewed to determine whether stealing was identified as a target behavior for one or more specific individuals and whether changes in stealing were evaluated using a single-subject experimental design (A-B, at minimum) with data depicted graphically. Of specific interest were articles dealing with nonviolent acts of individual participants involving the covert, physical acquisition (removing, taking, grabbing, etc.) of money, food, or other items belonging to others or the harboring thereof. Non-physical forms of stealing (such as intellectual theft accomplished electronically) and stealing with violence or aggression (armed robbery, carjacking, etc.) were excluded. All three identified articles met these criteria.

Subsequently, a similar but broader search for stealing articles was undertaken. This included using the online EBSCOhost academic search service with the key words "theft", "stealing", "shoplifting", and "kleptomania" for the period 1959 to 2019[2] Search results were limited to peer-reviewed, scholarly journals using PsycINFO, PsycARTICLES, and ERIC as the

databases. An article so identified as being relevant to the search criteria prompted use of a function that searches for similar articles. A comparable online search was conducted of journals found to publish research on the functional analysis (FA) of problem behavior (see p. 153 of Hanley, Iwata, & McCord, 2003). Articles with titles suggesting that the criteria for inclusion were likely satisfied were examined further by reviewing the abstract and, in some cases, the method section and data display(s), if any. Lastly, the reference sections of all of the identified articles (including those from the initial *JABA* search) were reviewed to determine additional articles that were reviewed using the same criteria. Exclusionary criteria included lack of direct and/or continuous measurement of stealing or the clear products of stealing (as when items placed in a specific location for purposes of testing an individual's stealing repertoire are discovered missing and can reasonably be attributed to the targeted individual), measurement of "suspected stealing" in the absence of explained evidence (e.g., Seymour & Epston, 1989; Venning, Blampied, & France, 2003), non-data based reports of stealing (Henderson, 1983), studies in which stealing was collapsed into broader categories for measurement (e.g., "eating errors" in Azrin & Armstrong, 1973; "delinquent behavior" in Burchard & Tyler, 1965; "mealtime misbehavior" in Henriksen & Doughty, 1967; "deviant behavior" in Patterson, 1974; "impulsive behavior" in Snyder & White, 1979), studies omitting measurement altogether (Chen et al., 2003), studies using proxy measures (e.g., Alexander & Parsons, 1973; Brooks & Snow, 1972; Vogl & Rapp, 2011), group-design studies (e.g., Diener, Fraser, Beaman, & Kelem, 1976; Haines, Jackson, & Davidson, 1983; Schwitzgebel & Kolb, 1964; Snyder & White, 1979), non-treatment-based studies (e.g., Baruah, 1989; Diener et al., 1976), studies involving non-behavior analytic interventions (e.g., psychotherapy, education, medication only, etc.), large-scale, population-level attempts at theft deterrence (e.g., Carter & Holmberg, 1993; Rafacz, Boyce, &

Williams, 2011), literature reviews and discussion articles (e.g., Kazdin, 1987; Miller & Klungness, 1986; Miller & Klungness, 1989; Miller & Moncher, 1988; Robins, 1991; Stumphauzer, 1976; Tremblay & Drabman, 1997; Williams, 1985), and studies lacking graphed data (e.g., Altman, Bondy, & Hirsch, 1978; Brooks & Snow, 1972; Burchard & Tyler, 1965; Chen et al., 2003; Guidry, 1975; Henderson, 1981; Ingamells & Epston, 2013; Kraft, 1970; Seymour & Epston, 1989). Another study (Marholin & Gray, 1976) was omitted because it was unclear whether stealing was reduced, or employees became more careful when making financial transactions. This process generated 14 additional articles, yielding a final total of 17 articles pertaining to the individual-level, behavior analytic treatment of stealing (see Table 1). Included within these studies were two additional *JABA* articles (Barton, Guess, Garcia, & Baer, 1970; Van Houten & Rolider, 1988), although data were aggregated in Barton et al. and it was unclear which of the 16 participants benefited from intervention. Thus, based on the search criteria employed, the rate per year of identified stealing articles published in *JABA* (1968-2019) and all peer-reviewed journals including *JABA* (1959-2019) is 0.10 and 0.28, respectively. By contrast, Hanley et al. (2003) identified 179 FA studies on self-injury, 113 FA studies on aggression, and 53 FA studies on disruption through the year 2000. With 1959 as a conservative (given the publication date of Iwata, Dorsey, Slifer, Bauman, & Richman, 1982) but equivalent starting point, this would yield publication rates per year of 3.09, 1.95, and .91 for FA studies of self-injury, aggression, and disruption. Using 1982 as a somewhat liberal starting point (given a small number of FA articles published prior to this time), the respective publication rates for these behaviors change to 5.11, 3.23, and 1.51 (compared to a mean yearly rate of published behavioral intervention articles on stealing of .50 during the same period). Of course, this discrepancy would be much larger if the rate of stealing intervention studies were pitted against

the rate of intervention studies for the aforementioned topographies without regard to the inclusion of FAs meeting Hanley et al.'s (2003) criteria. To examine trends, the cumulative number of identified stealing articles was plotted against the number of journals publishing such articles each year across 10-year periods from 1960 to 2019 (Figure 1). The largest increase in identified stealing publications across 10-year periods (6), which corresponds to the largest number of publishing journals (6), occurred between 1980 and 1989. Only six behavior analytic stealing articles were identified as being published since 1990. *JABA* was the most frequent outlet for these studies (Figure 2). Referring to Table 1, thirteen of the 17 (76.5%) studies involved youth ages 6-16 years old, and 13 (76.5%) of the studies included persons diagnosed with intellectual and developmental disabilities (IDD) as participants. Items stolen by participants of these studies most often included food (11 studies or 64.7%) with others including various leisure items (e.g., toys, books), money, school supplies, home supplies (e.g., toiletry, matches) and clothing/accessories. In terms of measurement, eight studies reported using frequency (47.1%), six studies measured permanent products (35.3%), two studies (11.8%) used time-sampling or interval-based recording, and two studies used latency measures (11.8%). Only two of the identified articles (Lambert et al., 2019; Simmons, Akers, & Fisher, 2019) used FA methods to determine the function of stealing, and three studies (20%) employed only indirect or non-data-based assessment methods (e.g., structured or open-ended interviews, etc.). Perhaps not surprisingly, function-based interventions were rare (exceptions include Lambert et al., 2019; Luiselli & Pine, 1999; Mace et al., 2010; Simmons et al., 2019; Wetzel, 1966) and eleven studies (64.7%) included a punishment component (overcorrection, timeout, reprimands, restitution, etc.), not including response blocking. Six studies (35.3%) involved multiple baseline designs, five studies (29.4%) used reversal or withdrawal designs, and one study

involved a multielement design (6%). Minimal experimental designs (e.g., AB, ABC, ABCD), susceptible to various internal validity threats, were used in six studies (35.2%). Lastly, ten (59%) of the studies reported some measure of maintenance or generalization.

Unfortunately, Switzer et al.'s (1977, p. 267) lamentation that "…the study of dishonesty in its various forms (lying, cheating, and stealing) has apparently been overlooked" remains largely unchanged. Since Switzer et al., others have also noted the literature gap pertaining to stealing and its interventions (Luiselli & Pine, 1999; Grant, Odlaug, & Donahue, 2012a; Grant et al., 2011; Matson, Coleman, DiLorenzo, Vucelic, 2008; Venning et al., 2003). What factors account for the meager contribution from the field of ABA to addressing this socially significant behavior? In short, stealing is difficult to observe and, therefore, hard to measure (Azrin & Wesolowski, 1974; Henderson, 1981; Hinshaw, 2005; Jeffery, 1969; Maglieri et al., 2000; Miller & Moncher, 1988; Page, Finney, Parrish, & Iwata, 1983a; Page, Stanley, Richman, Deal, & Iwata, 1983b; Pawsey, 1996; Reid & Patterson, 1976; Switzer et al., 1977; Venning et al., 2003; Vogl & Rapp, 2011; Williams, 1985). Further, if stealing occurs but is not directly observed, attributional difficulties arise (Switzer et al., 1977; Tremblay & Drabman, 1997). Even if accurate identification occurs after-the-fact, the delay may be sufficient to abate the effectiveness of punishment (Lerman & Vorndran, 2002; Van Houten & Rolider, 1988). Also, due to crowds and other physical barriers, certain contexts (like stores) may limit continuous, unimpeded observation (Buckle & Farrington, 1984).

A second factor possibly contributing to the dearth of treatment-oriented research on stealing concerns its reported low-rate of occurrence (Buckle & Farrington, 1984; Hamilton, 1984; Henderson, 1981; Pawsey, 1996; Reid & Patterson, 1976; Seymour & Epston, 1989), a fact that may be influenced by fluctuating motivating operations (MOs; Laraway, Snycerski,

Michael, & Poling, 2003), intermittent opportunities upon which to act (Cameron, 1964; Farrington, 1979; Switzer et al., 1977), parametrically competing sources of intermittent reinforcement (Baum, 1974/1979; Fisher & Mazur, 1997; Pierce & Epling, 1995) and punishment (see Akers, 1973, p. 197; Bandura & Walters, 1959, p. 365; Jeffery, 1977, p. 276) (with some concomitant inhibitory stimulus control, consistent with reactivity effects noted by McCall, 1975; Pawsey, 1996), and rule-governance pertaining to verbal contingencies about the likelihood of punishment (as intimated in Johnson, 1979, p. 35; Moore, 1984, pp. 58-59). For example, baseline rates of theft were reported at weekly or less often in Hamilton (1984) and Henderson (1981), up to biweekly in Reid and Patterson (1976), monthly or less often in 57% of cases reported by Seymour and Epston (1989), and 10 months to 5 years in Pawsey (1996). As noted by Mace (1994, p. 541), behavior occurring at sufficiently low rates may impede the ability to capture enough naturally occurring instances to permit accurate predictions. Also, Buckle and Farrington (1984) noted that, due to low rates of shoplifting, many samples of such behavior would be required to offer a convincing demonstration of rate reduction. Mace viewed the limitations of measuring low-rate behavior as problematic to the point of potentially precluding non-laboratory investigations of predictive variables. While a few investigators have assessed other low rate behaviors via FA methodology (e.g., Kahng, Abt, & Schonbachler, 2001; Tarbox, Wallace, Tarbox, Landaburu, & Williams, 2004), neither waiting for a natural occurrence of theft to initiate assessment activities (Tarbox et al., 2004) nor conducting day-long experimental manipulations (Kahng et al., 2001) seem reasonably efficient or practical. Further, in Kahng et al. and Tarbox et al., problem behavior was measured in terms of rates (per hour and per min, respectively) that likely far exceed the naturally occurring rates of even the most adroit thieves[3].

The various difficulties associated with studying low-rate, covert responses led some investigators to re-examine the definition of stealing, how it is measured, and the conditions conducive to its measurement. Although what constitutes an act of theft would seem fairly straightforward, Belson (1975) identified 44 different types or contexts of stealing (e.g., buying stolen goods, taking money from a meter, stripping materials from buildings, stealing evoked by a dare, unlawful entry with stealing, etc.) and various definitions have been employed. In one early example (Azrin & Wesolowski, 1974), theft of food by persons with intellectual disabilities in fairly controlled settings was apparently obvious involving grabbing food from another individual's hand. Barton et al.'s (1970, p. 78) definition was comparably simple in its description of the acts of concern ("removal of food or other objects from another resident's tray"). However, other researchers have offered definitions that reflect the difficulties inherent in observing instances of stealing across less-controlled settings. For example, Wetzel's (1966, p. 370) early definition of stealing did not include operational terms but referenced the products of stealing ["...whenever the property of another person, the school, or the home was found on Mike's person, in his locker, or in his room, and it was determined that the property had not been legitimately given to him, they were to (a) record a stealing incident…"]. Switzer et al. (1977) took an approach similar to Wetzel but with the advancement of providing an inventoried list of possessions against which checks for missing items could be made (see also McNees et al., 1976). Observational difficulties were such that Vogl and Rapp (2011) measured a proxy response in the form of loitering in an area where their participant had previously stolen things. In arguing for a definition that is "overinclusive and precise", Miller and Klungness (1989, p. 89) also emphasized the products of theft and endorsed definitions that labeled stealing in terms of either taking items belonging to others or being in possession of such items (Patterson, 1982;

Reid, 1975; Reid & Patterson, 1976). To circumvent disagreements as to whether a child should incur blame for the possession of unexplained items, some investigators expanded the definition to include reports from trusted individuals of suspected stealing (e.g., Miller & Klungness, 1989; Patterson, 1982; Reid, 1975; Reid & Patterson, 1976; Seymour & Epston, 1989; Venning et al., 2003). However, Seymour and Epston (1989, p. 139) characterized this approach as "guilty until proved innocent". While permanent product recording, an indirect behavioral measure, remains an accepted and useful method in ABA (see chapter 4 of Cooper, Heron, & Heward, 2007), reported suspicions are decidedly non-behavioral as they involve what is said about behavior rather than the actual commission of behavior (Baer et al., 1968). Also, Baer et al. considered reliability measures (i.e., interobserver agreement or IOA), which have been omitted (probably by necessity) in studies measuring suspected theft (e.g., Pawsey, 1996), a requirement of an appropriately behavioral study. Further, some (Pawsey, 1996; Seymour & Epston, 1989) have noted that a lack of suspicion does not rule out competent, undetected theft. Given the multiplicity of contexts and locations that an individual might experience on any given day, perhaps one can never truly be certain that stealing has been eliminated from an individual's repertoire (Pawsey, 1996; Reid & Patterson, 1976;). Of course, a similar argument could be made regarding other behaviors that sometimes occur outside of direct observation (e.g., stereotypy, voyeuristic behaviors, automatically-reinforced self-injury, etc.).

Perhaps, though, a reasonably convincing approach to measuring stealing can be accomplished within the behavioral realm. Such an approach would need to make inroads with respect to accounting for the problems of covertness and infrequency. Farrington (1979) argued that the controlled, experimental measurement of deviance as a dependent variable necessitated arranging opportunities for the occurrence of deviant behavior. Also, in their seminal article,

Hartshorne and May (1928, p. 406) noted that, "The first major problem, therefore, for a complete study of deceit is that of adequately sampling life situations in which deceit is practiced." Accordingly, Hartshorne and colleagues ([4]Hartshorne & May, 1928; Hartshorne, May, & Shuttleworth, 1930) exposed nearly 11,000 middle school students to various character tests in which opportunities to cheat or steal were arranged. In one test, called "The Mystery Man", children situated in a group had to identify various objects (some of which were likely of interest, including dimes) without looking at them and, after viewing them, transport them to another room where an opportunity to steal arose. A second test, called "The Planted Dime Test", involved examining whether children would pilfer dimes baited in boxes with puzzles they were to solve before returning boxes to their receptacle. Finally, in versions called "The Magic Square Test" and "The Coin Counting Test", children had the opportunity to fail to return coins that were needed in order to solve a hand-drawn puzzle or to answer arithmetic problems. The clever methods utilized by Hartshorne and colleagues may have been an early precursor to so-called "honesty traps" (or perhaps more aptly, "dishonesty traps", coined by Pawsey, 1996) utilized or recommended by multiple researchers in their attempts to evaluate or treat stealing (e.g., Epston & Seymour, 2008; Hamilton, 1984; Henderson, 1981; Hinshaw, 2005; Hinshaw, Heller, & McHale, 1992; Hinshaw, Simmel, & Heller, 1995; Ingamells & Epston, 2013; Seymour & Epston, 1989; Switzer et al., 1977; Tremblay & Drabman, 1997; Venning et al., 2003). In the context of treatment, such traps have been labeled attempts to build "temptation resistance" (e.g., Venning et al., 2003) and share similarities with behavioral conceptualizations of establishing self-control versus impulsivity (e.g., Dixon et al., 1998; Dixon, Lik, Green, & Myerson, 2013; Logue, 1995; Vollmer, Borrero, Lalli, & Daniel, 1999). One of the first such examples was offered by Switzer et al. (1977) who reported distributing 10 items (including

nickels, gum, markers, erasers, pen), selected because they were often reported as missing, in various locations (on a book case, on a desk, next to a sink and water fountain, near resource tables, and at the children's reading tables) meant to closely mimic natural conditions, across 3 second-grade classrooms. The items were embedded in pairs with the locations and pair members varying each day. The embedded items were kept on an inventory list against which observers could check if any went missing. While the embedding of items known to be targets for theft as done by Switzer et al. might be expected to permit efficient establishment of baseline rates, such was not the case. Switzer et al. reported lengthy baselines with a good deal of variability (for example, 40 sessions, each lasting 90 min, were required in the first leg of their multiple baseline). Perhaps the failure to efficiently attain stable baselines was related to inhibitory stimulus control associated with the presence of the teacher or certain students with a history of reporting peer misbehavior, among other factors reviewed herein. One potential benefit of such embedding procedures (noted by Switzer et al.) is the guarding against spurious treatment effects due to uncontrolled variations in the quantity of available items. Of note, these authors reported obtaining 100% IOA using the inventory checklist. Regarding ethical considerations, Switzer et al. advised against embedding items of high value or ecologically irrelevant items (i.e., not commonly found in the environment of concern) and suggested that steps be taken to ensure that new theft repertoires are not established.

Farrington and Knight (1979) asked 25 youths to sort coins from a bag of money while left alone in a van. Measurements of stealing involved recounting the money after the sorting task to see if any coins had been stolen (a type of permanent product measurement).
In Henderson (1983), parents and other adults awarded bonuses (as part of a token system within a broader package of treatments) to young children and adolescents that did not steal when

presented with “dishonesty traps”. To facilitate success (i.e., absence of stealing), items were initially embedded in obvious locations and with some clear likelihood of getting caught (though details regarding the latter were omitted). A potential problem with this embedding approach (apparently recognized by Henderson) concerns difficulties in determining whether the trap was noticed. Henderson’s use of traps was limited to treatment and was not apparently utilized for purposes of establishing a baseline. Similar procedures were reported by Seymour and Epston (1989) who embedded money and other items (known to have been stolen by their participants) in locations likely to facilitate their discovery by participants and not others. The latter feature is important in terms of minimizing theft attribution errors. Abstinence from trap stealing was met with a delayed reward such as verbal praise or (for younger children) a special story time. Contingent upon taking an embedded item, children were required to return the item to its owner and complete one-hour of household work. Seymour and Epston viewed it as important to couch the traps as opportunities for the child to demonstrate honesty (i.e., the focus was placed on the skill of passing the test, rather than highlighting the dishonesty of failing it). To disguise the intent of the traps and make them as natural as possible, Ingamells and Epston (2013) asked parents to vary the locations and times of day. As with Henderson (1981), the traps in Seymour and Epston were not used to establish a baseline, no systematic data recording efforts or reliability analyses were described, and no graphed data were presented. Although Ingamells and Epston informed their 12-year-old participant that he would be tested for honesty (which involved placing candy in a kitchen cupboard, unpacking a grocery bag that contained coins or cash, or washing dirty laundry with items embedded in clothing pockets), details of what this entailed were not offered to the boy in advance. Interestingly, Pawsey (1996) reserved the use of embedded items until other procedures that he considered less restrictive (including enhanced

supervision and punishment) had been attempted. The model presented by Tremblay and Drabman (1997) also used similar embedding procedures, but they viewed their use as a means of testing the effectiveness of other interventions (e.g., required apology, simple correction, restitution, response cost). An advancement offered by Tremblay and Drabman involved discreetly marking embedded items to ensure clear identification of stolen vs non-stolen items. For example, a pencil mark was made on money left in bedroom furniture or in a parent's coat pocket. Although children (ages 4 through adolescence) were told that they would be monitored closely for stealing, they were not made aware of the embedding procedure in advance. One of two mothers in Venning et al. (2003) declined to conduct the "honesty probes" for her 6-year-old boy. Another parent (of a 10-year-old boy) agreed to place money into a purse and leave it in the kitchen for 24 hours. After 24 hours, the purse was checked to determine if stealing had occurred and, if not, verbal praise was provided to the child. Although data were graphed in Venning et al., baseline data were taken from retrospective parental reports (i.e., recollections) and both baseline and treatment data included suspected stealing. Given those limitations, stable baselines were attained following 4 weeks for each child (data were graphed as instances of stealing per week). The data reflected that stealing decreased for both boys, and no stealing occurred during two honesty probes (for Fred). An assumption, of course, is that the purse was noticed by the child, which highlights the need for traps to be conducted as part of baseline measurement (to show that the child "fails" the tests prior to treatment). While no suspected stealing occurred during a follow-up conducted 10 weeks later, interpretations are hindered by limitations of the design (ABC) employed (see Campbell & Stanley, 1963; Chapter 7 of Cooper et al., 2007; Kazdin, 2010) and the absence of reliability data.

An example offered by Maglieri et al. (2000) illustrates the potential for traps to offer a context within which viable measurement of stealing can be accomplished during baseline and treatment phases. Under a ruse in which a 14-year-old girl diagnosed with Prader-Willi syndrome was left alone with snacks (cookies, pretzels, etc.) in their original containers, Maglieri et al. measured pre- and post-session weights of the snacks as permanent products of theft. Stable baseline weights (in grams of food) were attained within 17 sessions (east lasting 10 min) with reliable measurement. When punishment effects of verbal reprimands persisted during an attempted return to baseline phase, changing to a new setting effected elevations in the dependent measure. While questions remain regarding external validity (due to the controlled setting) and the precise aspects of the interventions responsible for impacting the dependent measure (including the fact that stealing was not directly targeted), the methodology used by Maglieri et al. offered a promising advance in terms of the relative efficiency of baseline establishment and the reliability of continuously measured products of theft. The methods employed by these investigators to establish inhibitory stimulus control deserve further evaluation (see also Piazza, Hanley, & Fisher, 1996; Tiger, Wierzba, Fisher, & Benitez, 2017).

Perhaps the most auspicious attempts at the measurement and treatment of stealing were offered in two studies by Page and colleagues (1983a/1983b). In the second of these studies (1983b), traps were used both as the primary context within which stealing was measured during baseline and treatment phases (across two settings) and as part of stealing probes conducted in the bedroom of a 28-year-old insulin-dependent female diagnosed with Prader-Willi syndrome[5]. Observers in this study recorded the frequency of stealing various snack items arranged on a table from an adjacent observation room. The authors reported 97% or higher IOA over the phases of the study. Using a token-based differential reinforcement of other behavior (DRO)

procedure, Page et al. (1983b) showed reductions in stealing across both settings with successful schedule fading up to 120 min. Stealing during probes also reportedly decreased from 2.25% (of embedded items) during baseline to a mean of 1% during treatment. Follow-up data collected in two post-discharge settings (where a modified version of the treatment was transferred) reflected continued decreases in weight (with 100% IOA) and a reduction in the required dosage of insulin. Similar procedures were also followed in the 1983a study (with comparable IOA results) except that DRO effects were demonstrated across three settings and two participants (ages 8 and 11), both of whom were also diagnosed with Prader-Willi syndrome. The inclusion of multiple settings was laudable in that bolstered confidence in the robustness of treatment effects and made inroads towards addressing concerns (e.g., Pawsey, 1996; Reid & Patterson, 1976) that the completeness of stealing reductions can never truly be verified. Also, in the 1983a study, no stealing probes were used, and a stable baseline emerged following only three sessions for Alice (who participated in the first leg of the multiple baseline). Unfortunately, treatment gains were not maintained under less-controlled conditions as evidenced by post-study weight gains for both children. Given that the frequent appearance of a therapist might be expected to deter theft (via generalized inhibitory stimulus control, perhaps with rule-governance), one limitation of these studies concerns whether or not the DRO procedure was necessary (i.e., perhaps the provision of frequent monitoring in the absence of a reinforcement contingency would have suppressed stealing). Overall, Page and colleagues offered a potentially fruitful model in which stealing is initially measured and treated by trained therapists under well-controlled and closely-monitored conditions before gradually and systematically transferring components to other caregivers and more natural, loosely arranged settings (for a similar approach, see Hanley, Jin, Vanselow, & Hanratty, 2014; Tiger, Hanley, & Bruzek, 2008).

Notwithstanding the methodological flaws of the extant literature, the embedding of items for purposes of examining the stealing repertoires of (primarily) children and adolescents has strong precedence and holds promise as a context within which stealing can be reliably measured and treated. Specifically, honesty traps simultaneously address concerns regarding covertness and low-rate responding by offering a naturalistic context in which stealing is likely to occur (addressing the latter) and can be measured via frequency or permanent product recording (addressing the former), depending on the conditions of observation. Based on the summary presented herein, a number of practices that might guide future investigators have emerged including (a) embedding items known to have been stolen by the participants (e.g., Page et al., 1983a/1983b; Seymour & Epston, 1989; Switzer et al., 1977), (b) disguising traps by offering a ruse (e.g., Hinshaw, 2005; Maglieri et al., 2000; Page et al., 1983a/1983b), (c) varying the placement (Ingamells & Epston, 2013; Switzer et al., 1977) and timing (Ingamells & Epston, 2013) of embedded items, (d) using familiar hiding places (Seymour & Epston, 1989; Switzer et al., 1977), (e) withholding details of the traps from participants (Hinshaw, 2005; Page et al., 1983a/1983b; Seymour & Epston, 1989; Switzer et al., 1977), (f) making it clear to participants that embedded items belong to someone else or should otherwise be left alone (e.g., Page et al., 1983a/1983b), (g) discreetly marking embedded items for identification (Tremblay & Drabman, 1997), and (h) ensuring that embedded items are not discoverable by other individuals who could steal or misplace them (Seymour & Epston, 1989). At first glance, (e) and (f) appear to be at odds with each other, but the latter could be accomplished without compromising the former. For example, embedded items could be clearly marked as another person's property or a therapist (under a ruse) might indicate that she is leaving behind some of her possessions before leaving the room. Note that overlap exists between much of the guidance offered here for

embedding stealing targets and previously offered recommendations for addressing reactivity effects (Kazdin, 1979; Rooker, DeLeon, Borrero, Frank-Crawford, & Roscoe, 2015).

An additional approach to disguising the purpose of traps or making them unpredictable might involve interspersing trials in which only items not likely to be stolen (if discovered) are present. While previous investigators have used traps as stealing probes (e.g., Page et al., 1983b) during treatment, traps could also be conducted during baseline for later comparison. The latter approach might permit determine the extent to which traps are even noticed (an interpretational difficulty that arises when stealing does not occur during treatment phase-only traps). That is, stealing during baseline traps would confirm that embedded items were detected, although the absence of stealing might reflect other variables (non-detection, item non-preference, MO fluctuations, inhibitory stimulus control, etc.). Also, in addition to snacks, Page et al. (1983a/1983b) provided access to leisure items that were unlikely stealing targets. Given that some individuals might steal food *and* leisure items, this sort of control manipulation may be uniquely suited to studies involving the treatment of persons that only steal food. One area of uncertainty concerns the duration of individual traps, which have varied widely from 10 min (Maglieri et al. (2000) to 24 hours (Tremblay & Drabman, 1997). Perhaps the FA literature can offer guidance as other problematic responses have been evoked under controlled conditions during 5-min sessions (e.g., Northup et 1991) and during 2-min trials with pre- and post-trial control segments (Bloom, Iwata, Fritz, Roscoe, & Carreau, 2011).

Some discussion regarding the ethics of embedding items seems appropriate (e.g., Hinshaw, 2005; Miller & Klungness, 1986; Pawsey, 1996; Switzer et al., 1977). Hinshaw (2005) considered parental informed consent and debriefing to be important components of ethically conducting honesty traps with children, although the appropriateness of debriefing may be

debatable in so far as the subjects would be selected based upon an undesirable characteristic (Hicks, 2019). As previously noted, Switzer cautioned regarding the types of items to be embedded (those that an individual has been known to steal) and avoidance of establishing new stealing repertoires. While this admonition has general appeal and coheres with more recent admonitions regarding the potential for false-positive functions to emerge during FAs employing tangibles as reinforcers (Galiatsatos & Graff, 2003; Rooker, Iwata, Harper, Fahmie, & Camp, 2011; Shirley, Iwata, & Kahng, 1999), it may be overly stringent. For example, a child known to steal a certain kind of candy (Sweet Tarts®) might be inclined to steal other types of candy (Now and Later®) despite the absence of previous opportunities to do so. Alternatively, an individual may in fact have a varied stealing repertoire despite a caregiver's inability to verify such. Multiple investigators have reported the stealing of more than one type of consumable item (e.g., Luiselli & Pine, 1999; Maglieri et al., 2000; Page et al., 1983a/1983b). Also, in other studies, participants apparently stole multiple items of a quite disparate nature such as toys and school supplies (Wetzel, 1966) and snacks and school supplies (Luiselli & Pine, 1999). While placing limits on the use of expensive items (Switzer et al., 1977) seems prudent and consistent with guidance offered by the American Psychological Association (2017), narrow and perhaps arbitrary limits on the range of items employed may inhibit attempts to foster and evaluate generalized behavior change (see Stokes & Baer, 1977). It would seem that the primary strategy for avoiding shaping new stealing repertoires would involve a careful screening process to ensure that stealing has been a persistent problem. Other concerns expressed (Hinshaw, 2005; Miller & Klungness, 1986; Pawsey, 1996) seem to center on subjective perceptions about the intrusiveness or deceptive nature of traps. A convincing counterargument can be inferred from Hartshorne and May (1928, pp. 47-48) who argued that, "No test should subject the child to any

moral strain beyond that to which he is subjected in the natural course of his actual life situations". Barring special circumstances (such as confined settings), most individuals encounter many opportunities to steal each day (a fact noted by Farrington, 1979, p. 230). Such situations include opportunities to steal at home (e.g., from a mother's purse left lying on a couch), at school (e.g., from a classmate's temporarily unoccupied desk), in the community (e.g., while shopping at a convenience store), and in a child's neighborhood (e.g., while visiting a friend's home). A similar point was made by Hanley (2012) concerning the fact that contingencies used to evoke problem behavior during FAs mimic those experienced every day (except that the former are often implemented in a controlled, systematic fashion so as to safely and efficiently yield beneficial information to aid treatment selection). This last point regarding efficiency is particularly relevant to stealing because direct observation under natural conditions may fail to yield useful data and prolong baseline phases, creating ethical concerns pertaining to delayed treatment. Concerning deliberate attempts to arrange opportunities for deviant behavior to occur, Farrington (1979) advised consideration of the potential risks such opportunities might pose to participants along with the potential risks of foregoing such opportunities (ostensibly degrading intervention efforts) including possible future arrest and loss of freedom due to incarceration. Farrington also suggested considering the potential adverse impacts of stealing on future victims and potential benefits to society (including knowledge gained) that might follow from using justifiable deception. Ultimately, Farrington argued that any risks (psychological or otherwise) posed to participants in such studies are likely negligible compared to the ongoing risks to potential victims of deviant behavior (including theft) and ongoing, naturally-arising risks to participants themselves outside of experiments. Certain factors may further bolster the ethical case for using traps including the frequency and severity of stealing (like the value of

items previously stolen, escalating occurrences, previous unsuccessful attempts at abatement such as removal of privileges or school suspension), involvement of law enforcement or risk thereof, harmful medical sequela that accompany weight gain related to consumption of stolen food, and other adverse outcomes (e.g., banishment from certain establishments). Lastly, the use of embedded items to evaluate stealing receives justification from its potential seriousness as evidenced by numerous studies showing a relationship between early onset of stealing and later, inauspicious outcomes (e.g., Farrington, 1973; Farrington, 2003; Farrington, 2005; Huizinga et al., 2003; Krohn & Thornberry, 2003; Lee & Hinshaw, 2004; Loeber, 1982; Loeber & Dishion, 1983; Mitchell & Rosa, 1981; Moffitt et al., 2002; Moncher & Miller, 1999; Robins, 1978; Robins, 1986; Robins & Radcliff, 1978; Tolan & Gorman-Smith, 1998).

Although problems pertaining to the observation and measurement of stealing may be the primary factors behind the dearth of controlled, behavior analytic treatment evaluations, an additional impeding factor may involve the absence of a demonstrated, comprehensive approach to the assessment of stealing. FA methods (Iwata et al., 1982/1994), in which antecedent stimuli are manipulated in the context of relevant MOs while the effects of commonly encountered consequences for problem behavior are systematically evaluated, remains the benchmark approach for identifying the variables maintaining problem behavior (Beavers, Iwata, & Lerman, 2013; Hanley et al., 2003). While numerous extensions, permutations, and refinements of FA methods have been reported (see Hagopian, Rooker, Jessel, & DeLeon, 2013; Hanley et al., 2003; Beavers et al., 2013), and a few authors have used indirect methods to assess stealing (e.g., Luiselli & Pine, 1999; Mace et al., 2010; Wetzel, 1966) or have intimated the importance of considering the function of stealing (e.g., Miller & Klungness, 1989; Pawsey, 1996), only two extensions of FA methodology to stealing have been reported. Both FAs targeted food stealing,

involved trial-based formats, used latency measures, and were conducted in clinic settings (and were thus analog). In Lambert et al. (2019), therapists with snacks sat across from a young girl with Prader Willi syndrome who either had access to the same snacks (control) or no snacks (test). Across alternated 2-min test and control trials the girl engaged in food stealing with consistently shorter latencies when snacks were only available via stealing (suggesting that stealing was maintained by non-mediated access to snacks). It is interesting to note, though, that this individual engaged in non-covert stealing during a social context (other eaters were present). By contrast, Simmons et al. (2019) reported on a young boy that took extra food at home without permission. Simmons et al. advanced FA methodology applied to stealing by initially showing that the boy's stealing was covert (occurred during alone condition trials but not during trials when a present caregiver ignored the boy's behavior). Subsequently, the boy consistently engaged in food stealing with shorter latencies during the alone condition relative to several social reinforcement conditions supporting a hypothesis of nonsocial reinforcement. There were several other interesting features of this study. First, the duration of the FA trials was 5 min instead of 2 min (affording an enhanced EO relative to Lambert et al., 2019). Second, during social reinforcement conditions in which access to either preferred edible or leisure items was provided contingent upon stealing, the caregiver left the room following an initial 1-min period of interaction with the child and only returned following stealing. This particular manipulation may have inadvertently evoked stealing during some trials designed to test for social reinforcement functions not solely because of the intended EOs but because of a change in supervision (i.e., decrease in inhibitory stimulus control associated with the caregiver's presence).

In light of the apparently common use of punishment and default strategies in the treatment of stealing (Miller & Klungness, 1986) and the potential for FA methods to generate reinforcement-based treatments (Hanley et al., 2003), perhaps associated with less reliance on punishment (Pelios, Morren, Tesch, & Axelrod, 1999), further extension of FA methods to stealing is warranted. Henderson (1981) noted the potential value in determining the function of stealing so that identified reinforcers could be used to strengthen treatment. Further, in the absence of a relevant research base upon which to draw, practitioners attempting to address covert stealing are left to extrapolate from the extant FA literature that has largely addressed various overt responses (e.g., physical aggression, self-injury, bizarre vocalizations, etc.). Such efforts are likely fraught with difficulties (extrapolating from Miller & Klungness, 1989).

Stealing differs from many commonly reported behavior problems (e.g., aggression, disruptive behavior, etc.) in that it produces direct, non-mediated access to tangible items. As such, and in the absence of evidence supporting alternative hypotheses, the most parsimonious account of response maintenance would seem to implicate nonsocial reinforcement (Farrington, 1973/1999; Jeffery, 1977). Nevertheless, the extant FA literature contains multiple examples of unexpected findings wherein other behaviors assumed to serve given functions were found to be differently maintained. For example, although pica is often thought to be insensitive to social reinforcement contingencies, Piazza et al. (1998) reported that 2 out of 3 participants exhibited pica sensitive to social reinforcement contingencies. Also, in Thompson, Fisher, Piazza, and Kuhn (1998), aggressive responses, typically assumed to be maintained by social reinforcement contingencies, were shown to occur in the absence of contingent access to attention. Other somewhat unusual behavioral functions have been reported including problem behavior that is differentially sensitive to contingent attention, but only when it is diverted to other individuals

(Fisher, Kuhn, & Thompson, 1998; O'Reilly, Lancioni, King, Lally, & Dhomhnaill, 2000; Taylor, Sisson, McKelvey, & Trefelner, 1993) and self-injury maintained by access to self-restraint (Smith, Lerman, & Iwata, 1996; Vollmer & Vorndran, 1998), among others. In this regard, the recommendation of Simmons et al. (2019) to avoid assuming the function of stealing seems wise.

In what follows, an overview will be provided of possible stealing functions with a focus on functions suggested in the extant literature that are most compatible with a behavior analytic perspective and consistent with the existing taxonomy of sources of social reinforcement and nonsocial or automatic reinforcement (see Hanley et al., 2003; Iwata et al., 1982/1994). In terms of theft, Akers (1973, pp. 196-197) surmised, "…not only is professional theft sustained by the positive reinforcement of monetary return but also the social reinforcement of recognition, prestige, and identify with other thieves as well as the respect of the police and others". Recognition and prestige were also cited in Leung et al. (1992) as contributing factors in childhood stealing that may include post-theft "gifting" to win the approval of friends or potential friends. Others (Baruah, 1989; Belson, 1975; Grant, Odlaug, & Kim, 2012[b]; Miller & Klungness, 1989; Nadeau, Rochlen, & Tyminski, 2019; Pawsey, 1996; Schlueter, O'Neal, Hickey, & Seiler, 1989; Tinney & Smith, 2019) have posited that a child's approval, acceptance, or elevated status in peer groups is relevant to the maintenance of stealing. The receipt of peer recognition, approval, acceptance, and prestige, although perhaps delayed in relation to stealing, would seem generally compatible with the notion of behavior reinforced by access to attention. Included in Renshaw's (1977) expansive effort to delineate the causes of stealing were attempts to gain peer affection through gifting stolen items, attempts to gain approval or attention from peers and antisocial family members, and stealing evoked by social challenges or dares (among

other less empirically-grounded causes). Although perhaps somewhat ambiguous with respect to social function, stealing on a dare or as a "rite of passage" amongst adolescents is also suggested in the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-5, American Psychiatric Association, 2013, p. 479). It is important to note, though, that dares and social challenges, consistent with the notion of peer pressure, may involve aspects of both positive reinforcement (e.g., delivery of praise from peers following completion of the challenge) and negative reinforcement (i.e., termination of the dare after completion of the specified response). Social reinforcement as a maintaining variable for stealing is also suggested by reports that youths sometimes steal with peer accomplices, report their illicit actions to peers, or distribute stolen items to peers (see Brooks & Snow, 1972; Buckle & Farrington, 1984; Miller & Klungness, 1989). In Moore (1984), some convicted professional shoplifters reported distributing stolen items to others for money or to purchase drugs, and Nadeau et al. (2019), asked shoplifters if they resold stolen items in order to assess motivational variables. Unless peer coercion is involved, distributing stolen items to peers (without exchange for money or other goods) suggests a social positive reinforcement function. Prazar (1992) suggested that stealing with accomplices was indicative of peer pressure. While stealing with peer accomplices suggests a possible social reinforcement function, the specific function may be ambiguous in that positive reinforcement (e.g., access to peer attention or the item stolen or both), negative reinforcement (e.g., escape from peer pressure), or both may be involved. Leung et al. (1992) implicated access to a qualitatively different sort of attention with a negative valence (i.e., parental reprimands) and suggested that items stolen in such cases might be of "trivial value". Similarly, in Wetzel (1966), descriptive information suggested that a 10-year-old boy's stealing was reinforced by access to attention (including attempts to explain his behavior to a

caseworker). Wetzel's hypothesis led to a function-based treatment involving contingent loss of access to an otherwise daily meeting with an individual whose attention the boy apparently valued. Although the boy ceased stealing after about 120 days, it is possible that the function pertained to accessing the items stolen (rather than the attention of adults) and that the selected contingency simply afforded an effective form of punishment. Based on reports from parents and teachers, Luiselli and Pine (1999) hypothesized that a 10-year-old girl's stealing produced reinforcement via access to extended discussions with adults about the behavior. Although this study had important limitations (e.g., use of an AB design, inclusion of unobserved verbal reports of stealing, uncontrolled variation in the availability of items to steal, and no treatment integrity data), a function-based treatment package (including withholding discussion regarding her stealing) was associated with reductions in stealing (although the behavior occurred sporadically during the 12-month follow-up). A secondary attention function was also hypothesized to maintain the stealing of a 12-year-old girl that took money from her classmates at school (see Stumphauzer, 1976). Interestingly, these examples seem to implicate social consequences that are temporally removed from the act of stealing, which suggests a possible role for rule-governance. It is important to note, though, that the empirical backing for social positive reinforcement functions is limited due to the use of indirect and nonexperimental approaches to hypothesis development.

Negative reinforcement functions may be at play when individuals steal in response to aversive social stimulation such as social or peer pressure (e.g., Farrington, 1973/1999; Moore, 1984; Nadeau et al., 2019; Schwartz, & Wood, 1991), perhaps leading to termination of badgering or the withdrawal of threats. Counter-control, as in stealing that serves as retaliation or revenge has also been suggested (Arboleda-Florez, Durie, & Costello, 1977; Bauer, 1973;

Bettleheim, 1985; Gerlinghoff & Backmund, 1987; Leung et al., 1992; Miller & Klungness, 1989; Moler, 1977; Renshaw, 1977; Schlueter et al., 1989). Ostensibly, then, stealing may be evoked when individuals are victims of aggression, stealing, or other unpleasant social phenomena. Although the presumptive reinforcer for retaliatory stealing in such cases might involve termination of the antecedent aversive social stimulation, likely temporal discontinuity between being a victim and exacting revenge suggests other possibilities (e.g., rule-governance). In a group-design study, Gallupe et al. (2016) exposed college students (whose histories of stealing were apparently unknown) to situations in which an opportunity to steal gift cards arose under a ruse in which the experimenter left the room for 2 min following a word unscrambling task. The authors reported no stealing in a control condition involving no prompts or modeling and a verbal prompting condition (in which 1 or 2 confederates endorsed stealing). Overall, few students stole cards (16 of 335 or 5%), but stealing was most likely to occur when two confederates both sanctioned and modeled theft-suggesting a role for peer pressure. Of possible categories of social reinforcement for stealing, negative reinforcement has the weakest empirical support. Aside from Gallupe et al., which did not concern an evaluation of persons known in advance to steal, empirical demonstrations of stealing evoked by aversive social phenomena are lacking. Lastly, although task-related negative reinforcement contingencies (e.g., escape from work prompts) have often been implicated in the maintenance of other problem behaviors (Beavers et al., 2013; Hanley et al., 2003; Iwata et al., 1994c), such a hypothesis would seem quite unlikely (on its face) with regard to stealing repertoires and no authors identified as part of the current literature review empirically demonstrated such a relation or proposed its existence.

Stealing has been characterized as “self-reinforcing” (Henderson, 1981; Stumphauzer, 1976) because it directly produces the likely reinforcer. The term automatic reinforcement

(Vaughan & Michael, 1982; Vollmer, 1994) is applied when behavior persists without social mediation and stealing without obvious social consequences seems consistent with behavior thusly maintained. The clearest examples of stealing likely maintained in the absence of social contingencies come from studies in which individuals, when left alone, were observed (e.g., from a separate observation room) to take embedded edibles (e.g., Maglieri et al., 2000; Page et al., 1983a/1983b; Simmons et al., 2019). Less convincing examples of stealing possibly unrelated to social contingencies involved ABC-type analyses and interviews with caregivers (e.g., Mace et al., 2010; Vogl & Rapp, 2011). While other forms of behavior sometimes serve automatic reinforcement functions (e.g., self-scratching, hand mouthing, head banging) wherein the response and reinforcer are somewhat conceptually intertwined (i.e., essentially viewed as one and the same), in many cases stealing likely requires an additional response (consumption, manipulation, etc.) that may occur with some delay in order to maintain it (suggesting a response chain in which the ultimate reinforcer is consumed or used without mediation). While non-mediated stealing differs from some kinds of automatically-reinforced problem behavior in that the former requires coming into contact with items that are otherwise not immediately available and the latter seems to involve a type of reinforcement that is immediately and perhaps continuously available such as self-injurious behavior ostensibly maintained by access to the sensory stimulation produced (e.g., Piazza, Adelinis, Hanley, Goh, & Delia, 2000; Roscoe, Iwata, & Zhou, 2013), the commonality between these seemingly disparate responses is the absence of reinforcer dispensation by another individual.

As opposed to implicating direct access to the item stolen (and its consumption or manipulation), a common theory in the general literature is that stealing is sometimes reinforced via the challenge, thrill, or excitement (i.e., physiological effects) involved in "getting away"

with something (Belson, 1975; Cone, 1978/1979; Grant & Kim, 2002; Grant et al., 2012b; Lo, 1994; Miller & Klungness, 1989; Moore, 1984; Nelson & Hayes, 1979; Pawsey, 1996; Renshaw, 1977; Schlueter, et al., 1989; Tinney & Smith, 2019; Weger, 1985; Wiedemann, 1998). This possibility is indirectly supported by reports that some individuals steal items of little or no personal value, a phenomenon termed non-gain stealing, nonsensical stealing, or nonrational stealing (Castiglia, 1999; Kraft, 1970; Krasnovsky & Lane, 1998; Moler, 1977; Schlueter et al., 1989; Hickey, & Seiler, 1989; Yates, 1986). Stealing as thrill seeking without social mediation is consistent with the notion of automatic reinforcement. Kleptomania, an apparently rare type of impulse control disorder diagnosed in 0.3-0.6% of the population, is a label applied to individuals that (acting alone) consistently fail to resist urges to steal unneeded items (DSM-5, American Psychiatric Association, 2013). Reportedly, individuals diagnosed with kleptomania often have concomitant psychiatric problems and experience a kind of psychological relief or other accompanying feelings (e.g., Grant et al., 2012b; Goldman, 1991; Krasnovsky & Lane, 1998; Marzagão, 1972; McNeilly & Burke, 1998; Olbrich, Jahn, & Stengler, 2019) upon stealing and "intrapsychic mechanisms" of the psychoanalytic sort have been implicated (Goldman, 1991). Although some have construed anxiety reduction as involving negative reinforcement (e.g., Bolles, 1973; Conger, 1956; McAllister & McAllister, 1991; Mowrer, 1947), highlighted by studies pertaining to the motivational factors of alcohol consumption (e.g., Lawyer, Karg, Murphy, & McGlynn, 2002; Samoluk & Stewart, 1998; Sayette, 1999), the applicability of this conceptualization to the kind of relief supposedly experienced in kleptomania is uncertain. It is interesting to note that tension or anxiety in kleptomania is thought to occur immediately before stealing in an evocative fashion (e.g., Goldman, 1991; Grant et al., 2012b; Mouaffak, Hamzaoui, Kebir, & Laqueille, 2020; Olbrich et al., 2019). However, it is unclear whether such tensions

arise independent of stealing opportunities or only in response to them. If the latter, what distinguishes kleptomaniacal pre-stealing tension from those of the typical thief worried about getting caught? Does not the typical thief experience a similar relief upon undetected theft? In fact, Sarasalo, Bergman, and Toth (1997) found that non-kleptomaniacal shoplifters and persons diagnosed with kleptomania reported having similar feelings or impulses in relation to thefts. At any rate, Skinner (1950/1974) objected to explanations of behavior appealing to other dimensions (e.g., undetermined relief, internal urges, thrill-seeking, etc.) and for which different measures were required (compared to those of the behavior of interest). In *Verbal Behavior*, Skinner wrote:

> There is obviously something suspicious in the case with which we discover in a set of ideas precisely those properties needed to account for the behavior which expresses them. We evidently construct the ideas at will from the behavior to be explained. There is, of course, no real explanation. (1957, p. 6)

In the case of non-socially maintained stealing, then, a more parsimonious account of the function would simply implicate access to the items stolen. Although stealing items without regard to need or value suggests that some individuals may not target specific items or may pilfer items randomly without regard to preference value, such may not be the case. Schlueter et al. (1989) interviewed 159 adults diverted to a community service program for first-time shoplifters and reported no significant differences with respect to the types of items reportedly stolen based on whether respondents were considered rational stealers (i.e., producing a clear gain, addressing a need, avoiding delays to pay, serving as retribution, or involving a challenge) or nonrational stealers. Although the limits of self-report data apply to Schlueter et al.'s findings, their data suggest that, across different categories of shoplifters, the immediate consequences may be fairly

consistent (i.e., illicit obtainment of similar sorts of items regardless of whether such items are apparently needed or valued). But, what to make of the notion that persons may forego consumption or use of items stolen instead choosing to give the items to others, throw them away, hide them, or even return the items to the location of the theft (DSM-5, American Psychiatric Association, 2013)? While distributing stolen items to others suggests the possibility of a social function pertaining to the receipt of attention or perhaps exchange for goods or money, maintenance of stealing via access to items that are not consumed, manipulated, or distributed to others seems perplexing (which may contribute to the proliferation of theories invoking internal sources of motivation). Despite this conceptual conundrum, the clearest stimulus change produced in relation to the component responses of nonsocially-maintained stealing remains access to the item(s) taken such that *something* about illicit acquisitions must be reinforcing. Of note, in the case of social reinforcement such as access to attention, physiological and perceptual changes (e.g., seeing the deliverer of attention or feeling her physical contact, etc.) clearly co-occur at the time of reinforcer delivery but may not be vital to understanding response maintenance. That is, knowing that non-mediated stealing entails gaining access to items (regardless of their apparent value or usefulness) may be sufficient for a behavioral analysis without invoking internal sources of motivation (e.g., physiological arousal or so-called thrill-seeking). From a treatment perspective, though, knowing whether individuals actually consume, manipulate, or otherwise use stolen items may be important. For example, the kinds of stolen items that are consumed might be effectively used to differentially reinforce some alternative behavior (e.g., DRA work); whereas items stolen but subsequently ignored might be ineffective as reinforcement in a DRA.

Lastly, while automatic negative reinforcement involving pain attenuation has been posited to maintain some forms of self-injurious behavior (e.g., self-scratching that may attenuate aversive stimulation of the skin), such a function would not likely arise in the maintenance of stealing. That is, nothing about stealing would be expected to alleviate physical discomfort.

In summary, considering the empirically-grounded, behaviorally-oriented hypotheses offered by researchers that have investigated stealing and the existing known functions for other problem behaviors (Beavers et al., 2013; Hanley et al., 2003; Iwata et al., 1994c), it appears that three general functions of stealing are likely. The function of stealing with the most empirical (yet still limited) support likely applicable to most cases involves maintenance via direct, non-mediated access to stolen items (a nonsocial function). In such cases, the item illicitly attained (and ostensibly manipulated or consumed) serves to reinforce the component responses of stealing without contribution from social variables. The second most likely function of stealing, broadly conceived, is a social one involving gaining mediated access to various types of positive reinforcement (e.g., attention, tangibles, money) via various means. This might include attempts to impress peers (e.g., on a friendly dare, to brag or show off stolen items to others, or gifting others to gain affection or status), to exchange stolen money or items with others for additional goods or money, or perhaps to receive attention via counseling or admonishments delivered by valued therapists, teachers, caregivers, or others. Importantly, even when an attention function is suspected, the potential reinforcing value of the item(s) taken should be considered (i.e., multiple control is possible). Finally, perhaps the least likely function for stealing involves social negative reinforcement. Although empirical demonstrations of stealing evoked by aversive social phenomena such as peer pressure or being the victim of assault, theft, or other unpleasant

events (i.e., retaliatory stealing) are lacking, such examples are frequently described in the general literature and have intuitive appeal. Although it is possible that stealing in response to social challenges or dares might be maintained by access to attention (e.g., "Way to go dude!") rather than escape from aversive aspects of the challenge (e.g., badgering), the analysis would need to factor that the delivery of challenges entails the provision of attention (a potential abolishing operation or AO for attention as reinforcement). What is needed at this juncture is the development of a systematic assessment process to aid in the analysis of the possible functions of stealing, ultimately for purposes of designing effective, function-driven interventions.

While stealing in the absence of social consequences may not completely fit with existing notions of automatic reinforcement, enough commonalities exist (e.g., non-mediation, high likelihood of occurrence in the absence of supervision, and perhaps other qualitative aspects of reinforcement such as relative control over the timing of reinforcer consumption) such that similar assessment approaches may be applicable. For example, Querim et al. (2013) exposed 26 individuals, which translated to 30 cases based on the number of problem behaviors targeted, to a screening process involving a consecutive series of 5-minute conditions in which they were either left alone or observed without comment or interaction. Prior to the study, most participants had engaged in stereotypy likely maintained via automatic reinforcement, but other topographies were also represented in their sample. Using results of a subsequent extended or full FA as the comparison, Querim et al. reported that their screening procedure accurately predicted behavior maintained in the absence of social contingencies in 21 out of 22 cases and behavior maintained via socially-mediated contingencies in 7 out of 8 cases. Stealing that persists when an individual is relatively alone (as in Querim's screening process), in the absence of socially-mediated reinforcement opportunities, may be maintained by direct access to the item

acquired via the response chain composing theft. Of course, if theft does not occur or fails to persist under alone conditions, the results would be equivocal, perhaps suggesting the (a) presence of inhibitory stimulus control associated with features of the environment, (b) a temporary abolishing operation, (c) absence of a preferred stealing target, (d) existence of a social reinforcement function, or (e) other unknown variables or processes. Also, stealing might be maintained by more than one reinforcement contingency as in "multiple control" (e.g., Beavers & Iwata, 2011; Smith, Iwata, Vollmer, & Zarcone, 1993). Further, commonly-employed FA methods may require various modifications in order to promote their utility for some individuals when applied to stealing such as employing confederates for purposes of examining the effects of social pressure, extending trial durations, or perhaps evaluating the role of extended or even delayed access to idiosyncratic forms of attention (if indicated as relevant by pre-FA information).

As a preliminary step towards developing hypotheses about behavioral function, best practice recommendations (Beavers et al., 2013; Hanley et al., 2003; Hanley et al., 2014; Kelley, LaRue, Roane, & Gadaire, 2011; Mueller & Nkosi, 2007; Mueller, Nkosi, & Hine, 2011) call for gathering relevant information (e.g., behavioral contexts, estimated frequency, potential controlling variables, etc.) by interviewing individuals familiar with the behavior of concern. Descriptive analyses, derived from direct observation of behavior under natural conditions, often follow and serve to confirm correlations between the behavior and potential controlling variables (e.g., Borrero & Vollmer, 2002; Thompson & Iwata, 2001/2007; Vollmer, Borrero, Wright, Van Camp, & Lalli, 2001). Indirect sources and/or descriptive analyses might also yield important information regarding idiosyncratic or unexpected variables of influence (Hanley et al., 2003; Schlichenmeyer, Roscoe, Rooker, Wheeler, & Dube, 2013). Information obtained via these

methods is then used to configure individualized experimental analyses (FAs) designed to test the effects of hypothesized controlling variables, sometimes combined with brief demonstrations of function-based treatment effects (e.g., Northup et al., 1991) prior to more extended treatment analyses. As each step in this process is completed, additional confidence is gained regarding the extent to which variables responsible for evoking and maintaining responses have been isolated (Iwata et al., 1982/1994; Vollmer, Iwata, Zarcone, Smith, & Mazaleski, 1993a).

In addition to concerns regarding the poor predictive utility of descriptive analyses (e.g., Hall, 2005; Tarbox et al., 2009; Thompson & Iwata, 2007), this approach may be particularly unlikely to efficiently yield useful information about stealing due to the covert, low-rate nature of the behavior (Buckle & Farrington, 1984; Hinshaw, 2005; Mace, 1994; Miller & Prinz, 1991) and likely reactivity of observation (McCall, 1975; Pawsey, 1996). Iwata and Dozier (2008) suggested that indirect assessment methods may be most appropriate when direct observation is infeasible. So, indirect methods may warrant additional attention in the assessment of stealing. Indirect assessment methods have often been structured or semi-structured in the sense of including a standard list of questions presented to an interviewee in a consistent order (Kelley et al., 2011). Although Dufrene, Kazmerski, and Labrot (2017) identified seven such indirect assessment instruments using their inclusion criteria, a review of several of the most commonly utilized tools will suffice here for illustrative purposes. For example, the open-ended and comprehensive Functional Analysis Interview Form (FAIF; see Appendix B in O'Neill, Horner, Albin, Storey, & Sprague, 1990) asks caregivers to identify the frequency, duration, intensity, efficiency, and topography of problem behavior along with potential setting events, daily activities, staff patterns, communication skills, potential reinforcers, controlling variables, current functionally-equivalent responses, and treatment history. Two notable drawbacks of the

FAIF concern its length (requiring 45-90 min to administer) and lack of ease with which the information can be readily summarized (Kelley et al., 2011). Rating scales (e.g., Durand & Crimmins, 1988/1992; Iwata, DeLeon, & Roscoe, 2013; Matson, Bamburg, Cherry, & Paclawskyj, 1999; Matson & Vollmer, 1995) offer an alternative, more efficient but less comprehensive approach. One of these, the Motivation Assessment Scale (MAS; Durand & Crimmins, 1988/1992), involves having caregiver's rate 16 items (each designed to ascertain the role of different social and nonsocial functions) on the extent to which they agree with the questions posed. For example, one question designed to evaluate a social negative reinforcement function asks, "Does the behavior occur following a request to perform a difficult task". Seven numbered scoring options range from "Never" to "Always" and the numbers circled are summed on the back of the form before deriving mean scores for each functional category. The functional category associated with the highest relative mean score suggests the most likely function for the behavior evaluated. Despite initially promising psychometric analyses, multiple subsequent investigations employing different calculation methods have found the MAS to be inadequately reliable (see review by Kelley et al., 2011, pp. 187-188).

Another common rating scale that has undergone extensive evaluations of its psychometric properties is the Questions About Behavioral Function (QABF; Matson et al., 1999; Matson, Tureck, & Rieske, 2012; Matson & Vollmer, 1995). The QABF has 25 items and samples equally from five categories of behavioral function (attention, escape, non-social, physical, and tangible). Questions pertaining to automatic positive reinforcement and automatic negative reinforcement are labeled "non-social" (including items referring to "self-stimulation" and enjoyment derived from the behavior in the absence of others) and "physical" (including items referencing a role for pain, discomfort, and illness). Social positive reinforcement

functions are sampled via questions that reference accessing attention, producing a social reaction, and the extent to which the behavior is evoked when items are taken away, etc. Social negative reinforcement functions are sampled by questions that reference problem behavior occurring in relation to escaping work or being asked to complete self-care tasks. Most questions are framed in terms of potentially relevant consequences and establishing operations (EOs) including forms of aversive stimulation (e.g., work, tasks, pain, removal of an item, etc.). A few questions are framed in terms of reinforcer deprivation (e.g., a peer or caregiver having access to an item), but no questions pertain to potentially relevant AOs. An example of the latter that, if answered affirmatively, would suggest AO effects relevant to social negative reinforcement functions might be, "Is the behavior less likely to occur during downtime or when the individual is alone?" Respondents rate how often the behavior occurs according to a Likert scale involving four anchors (Never= 0, Rarely= 1, Some= 2, and Often= 3). An "X" is marked for questions determined to lack applicability (e.g., due to insufficient contextual information or irrelevance to the behavior). The number of items rated "1" or higher for each category of behavioral function is summed producing a maximum subscale endorsement score of 5 (corresponding to the number of questions per subscale). The rating scores for each category are then summed (separately) producing a maximum severity score of 15 (five questions per subscale multiplied by a maximum rating of "3" per item). An accompanying summarization form is organized so as to permit graphing the results for a visual representation of the suggested function.

Of the 16 identified studies pertaining to the psychometric properties of the QABF, most (*N*= 14) involved examining the problem behaviors of individuals with IDD and seven studies involved more than 50 individuals. Factor analysis methods were employed in two studies

(Singh et al., 2006; Singh et al., 2009). In the 2006 study, Singh et al. reported identification of a five-factor solution for an adapted version of the QABF (for persons with mental illness) consistent with the five factors noted in the original QABF and accounting for 69.2% of the total variance. In the 2009 study, Singh et al. evaluated a short-form version of the QABF and reported identification of a five-factor solution accounting for 73.9% of the total item variance using exploratory factor analysis. Confirmatory factor analysis reflected that the proposed model and obtained data reflected excellent fit with the final model. Eight studies were identified as examining the internal consistency of QABF items (Freeman, Walker, & Kauffman, 2007; May, Sheng, Chitiyo, Brandt, & Howe, 2014; Nicholson, Konstantinidi, & Furniss, 2006; Paclawskyj Matson, Rush, Smalls, & Vollmer, 2000; Shogren & Rojahn, 2003; Singh et al., 2006; Singh et al., 2009; Zaja, Moore, van Ingen, & Rojahn, 2011). With the exception of May et al. (2014) who utilized teachers and paraprofessionals (rather than researchers or psychologists) to administer the QABF to students mostly without IDD, reported internal consistency measures (e.g., Cronbach's alpha) for the QABF subscales were generally acceptable or good although Singh et al. (2009) noted lower overall consistency for the form as a whole and Shogren and Rojahn (2003) noted low consistency for the Physical subscale. Freeman et al. (2007) reported correlations between QABF items and their respective subscales ranging from .39 to .81 with overlap between subscale outcomes generally low but higher for the escape and tangible subscales (range, .02 to .59). Eight studies examining reliability measures such as IRA and test-retest reliability were identified (Matson & Boisjoli, 2007; May et al., 2014; Nicholson et al., 2006; Paclawskyj et al., 2000; Shogren & Rojahn, 2003; Singh et al., 2006; Singh et al., 2009; Zaja et al., 2011). Studies reporting IRA and test-retest reliability of the QABF used a variety of calculation methods and, compared to studies including internal consistency outcomes, reported

more variation on measures of stability. For example, Singh et al. (2009) reported strong Pearson correlation coefficients for IRA on subscale outcomes (range, 0.815 to 0.955) and significant Spearman rank-order correlation coefficients (range 0.792 to 0.909). Also, Singh et al. (2006) reported correlation coefficients for the five factors ranging from .96 to .98. However, use of more conservative IRA calculation methods (such as exact agreements between raters on items or subscale scores) has produced more modest associations (Matson & Boisjoli, 2007; Nicholson et al., 2006; Shogren & Rojahn, 2003). Allowing for the previously mentioned caveats, May et al. (2014) reported generally weak levels of agreement using a variety of measures and Paclawskyj et al. (2000) reported a lower range of IRA values for item stability (across multiple measurement methods) compared to the stability of subscales and overall scores. Overall, Shogren and Rojahn (2003) characterized the literature following Paclawskyj et al. (2000) as generally reflecting lower levels of QABF IRA. Generally favorable test-retest reliability outcomes have been reported via intraclass correlations using Pearson *r* (Singh et al., 2006; Singh et al., 2009) and two-way mixed effects ANOVA models (Zaja et al., 2011). Shogren and Rojahn (2003) reported a range of Pearson correlation coefficients (0.62 to 0.93) across subscales lower than those reported by others including Paclawskyj et al. (2000) (range, 0.80-0.99).

Because rating scales have been viewed as tools for gaining preliminary information about potential behavioral functions that may serve to guide more direct methods of assessment (Iwata et al., 2013; Kelley et al., 2011), the extent to which indirect methods yield results that match those of other methods (particularly FAs) may be paramount. Eight studies included evaluations of the extent to which outcomes of the QABF subscales converged with other methods of determining behavioral function (Freeman et al., 2007; Hall, 2005; Healy, Brett, &

Leader, 2013; Matson et al., 1999; Paclawskyj, Matson, Rush, Smalls, & Vollmer, 2001; Shogren & Rojahn, 2003; Tarbox et al., 2009; Watkins & Rapp, 2013; Zaja et al., 2011). Generally, outcomes of comparisons between QABF results and results of brief or more standard-duration FAs have been encouraging (Hall, 2005; Healy et al., 2013; Watkins & Rapp, 2013) with one exception (Tarbox et al., 2009). For example, Healy et al. (2013) reported exact agreement on function between QABF results and FA results for 24 out of 32 (75%) individuals with autism and agreement on at least one function for 30 out of 32 (94%) individuals. Watkins and Rapp (2013) reported matches between functions identified by the QABF and brief FAs (or a series of no interaction sessions) for 5 out of 6 participants (83%). Also, matches between QABF results and FA results were found for 3 out of 4 participants in Hall (2005). Two studies comparing QABF outcomes to FA outcomes reported less favorable results. Tarbox et al. (2009) reported exact agreement between QABF results and FA results for 3 out of 7 (43%) participants and partial agreement (on at least one function) for 6 out of 7 (86%). Also, Paclawskyj et al. (2001) reported agreement between QABF outcomes and FA outcomes in about half the cases (*N*= 13) with three instances of undifferentiated FA outcomes. Matson et al. (1999) examined the extent to which the QABF can lead to selection of effective treatments. In Study 2 of Matson et al. (1999), participants (*N*= 180) were grouped based on their respective behaviors and randomly assigned to either a control group or a group that received a function-based, QABF-derived treatment. Participants in the latter group evinced significantly better treatment outcomes than individuals in the control group. Although of less clinical significance, researchers have also reported mostly favorable correlations between QABF results and the results of other rating scales including the MAS (Freeman et al., 2007; Paclawskyj et al., 2001;

Shogren & Rojahn, 2003) and Matson et al.'s (2003) Functional Assessment for Multiple Causality (Zaja et al., 2011).

One common but less studied alternative to the QABF is called the Functional Analysis Screening Tool (FAST; Iwata et al., 2013). In its current iteration, the FAST includes a brief, open-ended section (to obtain information about the relationship between the informant and individual, along with descriptions of the behavior and relevant contexts) and 16 standard questions divided equally across four functional categories (social positive reinforcement, social negative reinforcement, automatic positive reinforcement, and automatic negative reinforcement). The latter two categories are purported to assess sensory stimulation and pain attenuation, respectively, as potential maintaining variables. In contrast to the Likert scales of the MAS and QABF, questions on the FAST are answered affirmatively ("yes"), negatively ("no"), or as not applicable. For example, question #6, pertaining to a possible social negative reinforcement function, asks, "Does the problem behavior occur when the person is asked to perform a task or participate in activities?" To summarize the FAST results, the number of questions marked affirmatively for each functional category is totaled and the category with the highest number reflects the suggested function. Iwata et al. (2013) reported that administration time was 15-20 min (not including the preliminary, open-ended questions). The reliability of the FAST was examined by comparing the answers given by pairs of independent raters across 196 behaviors exhibited by 151 individuals with autism or other intellectual and developmental disabilities. Overall mean interrater agreement (IRA), determined by dividing the number of questions with agreement (e.g., both raters answered "yes" to the same question) by 16 for each rater pair and excluding any questions for which at least one rater scored "NA", was reported as 71.5% (range, 28.6% to 100%). The reliability of individual items was calculated by dividing

the number of agreements (for an item) by the total number of rater pairs resulting in an overall agreement range of 53.3% to 84.5% across items. Iwata et al. noted that items couched in terms of antecedent (versus consequence) influence were associated with somewhat higher reliability scores (*M*= 78.9%). Only questions #4 (regarding free access to attention and tangibles) and #14 (regarding recurring illnesses and pain) produced mean agreement scores of at least 80%. The authors also examined the extent to which pairs of raters scored the FAST in a manner yielding agreement regarding the function suggested (i.e., the highest number of "yes" answers was given to the same functional category). Overall agreement across rater pairs on functional outcome was 64.8%. Lastly, Iwata et al. evaluated the predictive utility of the FAST by comparing its outcomes to the outcomes of 69 FAs for 59 individuals (with some individuals participating in more than one FA). To minimize bias, the five highly trained reviewers of the resulting FA graphs, but not the FA therapists, were blind to the FAST results. Mean agreement between FAST outcomes and FA outcomes was 63.8% with the highest concurrence associated with social positive reinforcement outcomes. Aside from Iwata et al. (2013), psychometric evaluations of the FAST have been scarce. In one exception, Zaja et al. (2011) reported a relatively low range of internal consistency (using Cronbach's alpha) values (0.05-0.77) across functional categories. Zaja et al. examined a previous iteration of the FAST and reported ranges of IRA and test-retest correlations of 0.48 to 0.71 and 0.69 to 0.71, respectively. Lastly, percentage agreement measures for functions endorsed on the FAST in Zaja et al. were low (0.04 to 0.36 across both administrations), particularly compared to agreement ranges for the QABF 0.28 to 0.66), although the latter outcomes are not overly auspicious. Of note, Iwata et al. (2013) argued persuasively against the prominent use of correlational analyses for evaluating IRA of rating scales and questionnaires noting that such results pertain to group-level statistical

phenomena rather than the clinically more important matter of agreement at the individual level (also noted by Zaja et al., 2011).

Although, these initial outcomes seem modest, Iwata et al. noted that their results were comparable to reliability analyses conducted with similar assessment tools and suggested several uses for the FAST including (a) structuring necessary interviews, (b) offering a consistent format, (c) minimizing interview duration, (d) facilitating follow-up questions to generate more detailed information, and (e) streamlining FAs by permitting omission of conditions unlikely to evoke problem behavior (based on informants' answers). Because certain behaviors have been shown to be likely to serve specific functions (such as stereotypy maintained via automatic reinforcement), Iwata et al. suggested that future investigators examine modified versions of rating scales adapted to specific behaviors. Stealing may be one behavior for which any such instrument might warrant modifications. Specifically, an interview tool for stealing might require elimination of questions designed to uncover unlikely functions such as escape from task demands. For example, in Matson et al. (2005), the items related to the Escape subscale of the QABF were never endorsed for any of the 24 individuals that exhibited food stealing. Also, questions pertaining to an unlikely automatic negative reinforcement (e.g., pain attenuation) function for stealing might also be omitted (e.g., no endorsements occurred for items on the Physical subscale in Matson et al.). Other modifications might require altered wording or additional items to evaluate potential idiosyncratic social negative reinforcement functions of stealing evoked more specifically by coercive peer pressure or in response to victimization (i.e., retaliatory stealing). Despite concerns regarding the reliability findings for the FAST (Iwata et al., 2013), the general format of this tool is appealing in terms of simplicity and inclusion of an open-ended section. Further, the reliability of the FAST with respect to stealing is unknown.

Finally, although researchers and practitioners require some manner of gathering preliminary information about stealing (as with any problem behavior), the quality of the information received will likely vary based on (among other things) the extent to which the rater or interviewee has observed (or is aware of) the response and its context including potentially relevant antecedents and consequences (as noted by Miller & Klungness, 1989). This suggests the need for a usability analysis for any similar interview tool applied to evaluate the function of stealing.

The general aim of the first part of the currently proposed, multi-phase investigation was to conduct a comparison of the reliability of two indirect assessment methods when used for purposes of determining the potential function(s) of stealing. More specifically, the FAST, as one previously investigated method, was compared to a new instrument called The Stealing Inventory (TSI; see Appendix B). The TSI contains questions tailored to stealing and (like the FAST) is designed for administration to caregivers or others familiar with the stealing of target individuals. In addition to conducting a reliability comparison, Study 1 also examined (a) the extent to which each instrument yielded potentially useful information from caregivers (in terms of affirmative or negative responses to questions rather than indicating uncertainty), (b) differences in administration durations, (c) the extent to which administration of the two instruments produced outcome matches for individual cases, and (d) the extent to which the previously proposed social and nonsocial functional categories were represented in the TSI outcomes (e.g., by examining the frequency with which the various functions are indicated).

CHAPTER 2

METHODOLOGY (STUDY 1)

COMPARATIVE RELIABILITY ANALYSIS OF TWO INDIRECT METHODS FOR DETERMINING THE FUNCTION OF STEALING

New tool construction process. Although the overall format and item development process was similar to Iwata et al.'s FAST (2013) (e.g., consideration of potentially relevant MOs and reinforcing consequences), the TSI was adapted for assessing stealing in multiple ways. First, based on Matson et al.'s (2005) finding that QABF results failed to suggest a task-related escape function for individuals that steal food and the absence of published examples (empirical or theoretical) of task-related negative reinforcement functions for stealing, questions pertaining to task demands and escape thereof were omitted. For similar reasons, questions such as those from the original FAST designed to ascertain two types of automatic reinforcement functions involving pain attenuation and stereotypy-induced sensory stimulation were also omitted. Items developed specifically for the TSI were intended to evaluate the three previously suggested global functions involving social positive reinforcement, social negative reinforcement, and nonsocial reinforcement. Questions pertaining to a social positive reinforcement function were constructed to emphasize various types of mediated reinforcement suggested by the extant literature including use of stolen items to solicit attention via access to lengthy counseling sessions, verbal reprimands or other forms (Leung et al., 1992; Luiselli & Pine, 1999; Renshaw, 1977; Stumphauzer, 1976; Wetzel, 1966), exchanges with peers or others for goods or money (Moore, 1984), or distribution of gifts to win friendship or affection (e.g., Leung et al., 1992; Prazar, 1992; Renshaw, 1977). Because some authors (Baruah, 1989; Farrington, 1973/1999; Schwartz, & Wood, 1991) have alluded to the potentially evocative

effects of social or peer pressure and countercontrol (retaliatory stealing) on stealing (Bauer, 1973; Bettleheim, 1985; Gerlinghoff & Backmund, 1987; Leung et al., 1992; Moler, 1977; Miller & Klungness, 1989; Renshaw, 1977; Schlueter et al., 1989), a subscale (with newly created items) for this type of social function was included on the TSI. Questions designed to evaluate a nonsocial function of stealing, such as reports of stealing food under alone conditions (e.g., Maglieri et al., 2000; Page et al., 1983a/1983b) were worded to emphasize unaccompanied stealing that occurs covertly, without mediated access to other reinforcers, and towards items of relatively strong preference value. With regard to the latter feature, an assumption was made that item preference value should be more important to the person that steals when additional social reinforcement is not involved. That is, if the primary source of reinforcement for stealing involves access to attention or escape from aversive social phenomena, then (theoretically) the preference value of items stolen may be less important. This should not be construed as precluding the possibility of multiple, simultaneously acting sources of reinforcement (i.e., multiple control), though.

Another adaption involved use of the phrase "taking things" on the TSI in place of the generic "problem behavior" on the FAST. This characterization of stealing seems relatively dispassionate and less likely to evoke emotional reactions (perhaps thereby encouraging truthfulness). Various descriptive stealing-related questions were also included on the TSI to ascertain other behaviors of concern, the duration of the stealing problem, the estimated frequency of (observed and unobserved) stealing, the types of items stolen and their value, adverse consequences of stealing, locations of theft, and the involvement (if any) of accomplices. Based on recommendations from Hanley et al. (2003) and Hanley (2012), open-ended questions pertaining to potentially relevant antecedents and consequences of stealing were also included.

Lastly, an administration guide (Appendix C) was prepared for the TSI, including pre-administration instructions. Eighteen function-related questions (six for each category) were developed for the initial version of the TSI. Generally, questions were constructed so as to ascertain whether stealing was sensitive to different social consequences and related antecedent stimuli (including MOs) or whether stealing was maintained by nonmediated, direct access to items taken. Prior to use with participants, the initial set of questions was sent to a panel of five experts in the areas of FA and/or behavioral treatment of stealing to solicit feedback regarding wording, the extent to which each question suggested the behavioral function for which it was categorized, and alternative questions. Items were modified or replaced based on the obtained feedback emphasizing areas of agreement across the experts.

Participants, settings, and administration procedures. Forty-two vocally communicative individuals were recruited based on meeting the inclusion criteria of having engaged in stealing on at least three occasions within the previous 6 months (one of which had to have occurred in the previous 3 months). Although recruitment attempts occurred through various agencies and facilities including a statewide children and families services program, youth and family treatment centers, residential facilities for juvenile delinquents, grade schools, a brain-injury facility, and several psychiatric facilities, among others, only agencies operating community-based (typical residential) homes as part of a statewide Medicaid waiver program for persons with intellectual and developmental disabilities and several remotely located, large ICF/MR residential facilities agreed to host. Thus, all subjects had intellectual disabilities (likely in the moderate to mild range). Therefore, participating agencies and facilities were asked to identify only those persons meeting the aforementioned criteria who were likely to have at least a basic understanding of the wrongness of stealing (e.g., that victims are deprived of valued

possessions). Individuals were not excluded based on any psychiatric diagnosis, but individuals exhibiting aggressive or violent forms of stealing (e.g., aggravated robbery) or auto theft were excluded.

Subject characteristics are shown in Table 2. The average age of subjects was 47.3 (range, 14-76), and most (*N*= 37) had at least one psychiatric diagnosis. Most subjects were reported to have stolen weekly or more often (*N*= 30) and 12 subjects reportedly stole biweekly or less often. Beyond frequency, another measure of stealing severity concerns the value of items pilfered on any one occasion. Most subjects reportedly stole items worth up to $10 (*N*= 13) or up to $50 (*N*= 15), twelve subjects reportedly stole items worth more than $100. As another (albeit imperfect) indicator of severity, five subjects had been arrested for stealing. In terms of stealing targets (Table 4), all categories of items listed on the TSI (left column, question #4) were represented in this sample with most subjects reportedly stealing money (*N*= 40), food/drink (*N*= 37), electronics (*N*= 22), or clothing (*N*= 20). Thirty-nine subjects reportedly stole items from multiple categories. All stealing locations included on the TSI (left column, item #7) were represented in this sample with nearly all subjects stealing in their own homes (*N*= 41), while others stole from stores (*N*= 22), job sites (*N*= 14), restaurants (*N*= 10), and day programs (*N*= 7) or other places (*N*= 10). Lastly, all subjects had concomitant problem behaviors with lying (*N*= 41), verbal aggression (*N*= 37), and noncompliance (*N*= 37) being most common.

The FAST and TSI were administered to adults (staff persons, teachers, therapists, etc.) reported to be most familiar with each individual's previous stealing incidents (with a stated preference for adults that had actually witnessed one or more stealing occurrences). For staff persons of individuals living in typical community-based homes, administration occurred in a

relatively isolated area in the home setting. For individuals served in large, remotely located ICF/MR residential facilities, interviews were completed in the same manner except videoconference (e.g., Skype) was used and staff persons were situated in private meeting rooms or offices at the facilities. The TSI and FAST were administered separately to a second staff person within 2-3 days of the initial administration. The order of administration for the two instruments was counterbalanced across pairs of interviewees. Specifically, for the first participant, a coin flip was used to determine order of instrument administration. For the next participant, order of administration across raters was opposite of that used for the first participant. This pattern of alternating administration order continued across the remaining rater pairs for each participant.

The primary investigator served as administrator across all rater pairs. The administrator took notes on any problems pertaining to administration of the TSI (e.g., uncertainties or misunderstandings about items, etc.) and ways to improve the tool or interview process.

Usability analysis. High numbers of items marked as not applicable ("NA") would suggests usability problems for the FAST or TSI. Therefore, across instruments, the number of items marked "yes" or "no" was divided by the total number of items for each interviewee. The resulting percentages were averaged across all interviewees, which provided one (albeit crude) gage of the viability of the instrument for evaluating potential functions of stealing. A second measure of utility was obtained by recording the duration of each administration for each instrument.

Reliability procedures.

***Tool IRA*.** For each caregiver dyad, multiple types of IRA were evaluated for each instrument based partly on Iwata et al. (2013). First, overall percentage agreement (IRA) was

determined for each interviewee pair. Specifically, agreements on items marked "yes" and "no" were divided by the total number of items (omitting any items for which at least one respondent indicated "NA") and the resulting percentages were averaged across all respondent pairs. This yielded overall tool IRA figures for caregiver 1 vs. caregiver 2.

Item IRA. For each instrument, reliability at the level of individual questions (i.e., item stability) was determined by dividing the total number of agreements for a given item by the total number of respondent pairs. This permitted an analysis of which specific items might need to be modified or replaced.

Outcome IRA (for structured questions). Across instruments, reliability with respect to specific outcomes was evaluated by dividing the number of respondent pairs with outcome agreement (i.e., the same functional category received the greatest number of "yes" responses) by the total number of respondent pairs. When a respondent's outcome reflected a tie between functional categories for the greatest number of "yes" responses, an agreement was counted if one of the categories matched the outcome for the other respondent. For example, an agreement was scored if the outcome for respondent A suggested both an attention function and an escape function and respondent B's outcome suggested only an attention function. Because the utility of an informant's responses may be impacted by the extent to which stealing occurrences have been observed (Hinshaw et al., 1995), instrument outcomes were also examined separately based on the extent to which respondents reported having observed stealing in the act (including the antecedent context and any immediate consequence). This bifurcation occurred between respondents that reported having directly observed stealing three or more times within the previous 12 months versus respondents that reported not having witnessed the act during this period or having only done so once or twice. Outcome agreement was similarly assessed at a

more general level in terms of matches for social versus nonsocial functions (as recommended by Querim et al., 2013, p. 59). Agreements for this calculation were scored as long as both respondents' highest summary totals were associated with either of the categories of social functions or if both respondents' highest summary totals were associated with a nonsocial function. If an equal number of items were scored for social and nonsocial functional categories for both respondents, then an agreement was scored (i.e., the respondents' scoring totals reflected the possibility of both a social and a nonsocial function).

CHAPTER 3

RESULTS AND DISCUSSION

Overall tool IRA (aggregating all items) for the TSI and FAST was 85% (61.1% to 100%) and 80% (56.3% to 100%), respectively. Whereas most agreement scores fell between 81% to 100% (*N*= 28) for the TSI, the largest distribution of agreement scores for the FAST fell between 71% to 80% (*N*= 14) (Figure 3). For the TSI only, Cohen's κ was determined for respondent pairs. As shown in Table 3, κ was above .61 (substantial) for 25 (59.5%) rater pairs and above .81 (near perfect or perfect) for 14 (33%) rater pairs. The median κ was .73. The interpretive criteria established by Landis and Koch (1977) are widely employed, although it is not entirely clear how well they apply here given that the TSI is primarily intended as an adjunct to experimental FAs (as opposed to a stand-alone diagnostic tool). Note that Landis and Koch's κ interpretation guidelines were apparently developed subjectively and κ outcomes may depend on characteristics of the items evaluated and the extent to which the phenomena of interest are represented within the sample (Sim & Wright, 2005; Viera & Garrett, 2005).

Table 5 depicts individual item IRA scores for the TSI and FAST. For the TSI, eleven items (61.1%) had IRA scores at 80% or above (including items 3, 4, 6, 7, 8, 9, 10, 11, 13, 15, 18), and seven items (38.9%) had IRA scores below 80% (including items 1, 2, 5, 12, 14, 16, 17). By comparison, six items (37.5%) on the FAST had IRA scores at 80% or above (including items 3, 4, 6, 7, 9, 15), and ten FAST items (62.5%) had IRA scores below 80% (including items 1, 2, 5, 8, 10, 11, 12, 13, 14, 16). For the TSI, items with the lowest IRA included #1 (63.4%), #14 (67.5%), and #5 (72.5%). The lowest IRA ratings for the FAST were for items 12 (52.8%), 2 (59%), and 5 (64.3%).

With respect to whether each rater pair gave the highest number of endorsements (answered "Yes") to the same functional category or subscale (i.e., tool outcome), Table 6 reflects mean overall agreements of 92.9% and 73.8% for the TSI and FAST, respectively. FAST outcome agreement for raters when single functions or multiple functions were implicated was 87.1% (27 out of 31 cases) and 36.4% (4 out of 11 cases), respectively. There were no instances for which the TSI suggested multiple control of stealing. Generally, improvements in these outcomes were not evinced based on whether both raters had directly observed subjects stealing 3 or more times in the last year.

Table 7 presents a summary of TSI and FAST outcomes by type of reinforcement contingency suggested (based on combining subscale totals for each rater), along with IRA scores across the functional categories. The most striking contrast here concerns the percentage of cases for which social positive reinforcement (Sr+) was suggested via the FAST (83.3%) vs. TSI (7%), which impacted the overall mean outcome agreement across tools (42.9%). The fact that FAST outcomes most often suggested a social positive reinforcement function was surprising given the a priori assumption that most cases would entail nonsocial functions (e.g., Farrington, 1973/1999; Jeffery, 1977; Simmons et al., 2019; Vogl & Rapp, 2011). Interestingly, in Matson et al. (2005), QABF results for food stealing were elevated on the Tangible subscale (a social reinforcement category) relative to other mealtime behaviors, and this was not the case for the other functional subscales. These counterintuitive findings for the FAST and QABF are likely attributable to issues surrounding the composition of individual items in relation to the contextual factors of stealing. For example, on the FAST, knowing that an individual is not typically receiving attention (item 1) at the moment stealing may not distinguish between covert (likely nonsocial) and non-covert stealing. Further, attention in the form of counseling and

reprimands (item 3) may sometimes occur adventitiously in relation to non-socially maintained behaviors (Thompson, & Iwata, 2001/2007), and preferred but non function-based reinforcers might compete (item 4) with non-socially maintained behaviors, perhaps including stealing (extrapolating from Berg et al., 2016; Gover, Fahmie, & McKeown, 2019; Groskreutz, Groskreutz, & Higbee, 2011; Ringdahl, Vollmer, Marcus, & Roane, 1997). Similar problems are evident for items representing the Tangible subscale on the QABF. For example, learning that an individual engages in problem behavior to gain access to wanted items (regardless of item ownership) does not imply that the means of acquisition are overt or reinforced via social mediation (items, 5, 15, 20). Although further empirical demonstrations await, the fact that the TSI yielded a larger proportion of nonsocial or automatic reinforcement functions (92.9%) compared to the FAST aligns with conceptualizations offered by other researchers (e.g., Farrington, 1973/1999; Jeffery, 1977), lending the former a degree of face validity. The TSI reliability for the nonsocial reinforcement category was borderline, though, and overall reliability for this tool was pulled upward by rater agreements with respect to non-endorsement of social negative reinforcement items. By comparison, reliability for 3 out of the 4 functional categories on the FAST was less than 80% and 62.5% of FAST items had substandard reliability. A confirmatory factor analysis of the relation between the 18 TSI items and the three functional categories was omitted due to concerns regarding sample size (Bentler, 1995; Boomsma and Hoogland, 2001; Kline, 1998; Loehlin, 1998).

Iwata et al. (2013) suggested evaluating the FAST for single behavioral topographies. The caveats reviewed above notwithstanding, the mean overall FAST IRA score obtained here for stealing (80%) was higher than reported by Iwata et al. for multiple topographies (71.5%). Also, for 9 out of 15 (60%) individual FAST items (applied to stealing), increases were noted for

IRA compared to Iwata et al. (Table 8). Despite concerns about the relatively large percentage of social functions suggested by the FAST outcomes for stealing, the results here support evaluating the reliability of the FAST in relation to determining potential functions for additional, single topographies. Lastly, given the high reliability (100%) obtained here, along with its face validity for examining potentially covert behavior, FAST item 9 might be evaluated as a singular indicator for stealing maintained via nonsocial reinforcement.

In terms of usability, respondents answered 95.9% and 93.8% of items on the TSI and FAST, respectively. These high response rates may reflect confidence regarding the variables that precede and following stealing or a bias against giving answers reflecting uncertainty (e.g., "I don't know."), perhaps due to the demand characteristics of the interviews. Mean duration of administration was less than 15 min for each instrument, which compares favorably to durations reported in other studies on indirect assessment tools. For example, Iwata et al. (2013) reported 15 to 20 min for the FAST, Paclawskyj et al. (2000) and Tarbox et al. (2009) both reported 20 min for QABF administration, and Jessel et al. (2018) and Hanley et al. (2014) reported 30 min to 45 min and 20 min to 30 min, respectively, to administer their open-ended questions (Interview-Informed, Synthesized Contingency Analysis or IISCA). Because the interviewer in the current study was highly experienced administering the FAST and similar tools (over 20 years), TSI administration durations might be longer with other users.

Study 1 replicated and extended Iwata et al. (2013) by examining the reliability of the FAST and a new tool (TSI) when used for purposes of determining possible functions of a single topography of socially significant behavior, stealing. While both instruments had acceptable overall tool reliability (factoring all items for which a response other than NA was given), advantages for the TSI were evident in regard to higher tool reliability, superior outcome

agreement (with respect to suggested functions), a smaller percentage of tool items with substandard reliability, and face validity in terms of the strong representation of nonsocial reinforcement functions yielded relative to the FAST outcomes. While perhaps items with substandard reliability or irrelevance due to low endorsement (e.g., those pertaining to a social negative reinforcement function) could be removed from the TSI to further bolster the reliability ecological validity, and efficiency of interviews, it is possible that a different constellation of outcomes would be obtained if the tool were administered (as is) for other populations. For example, perhaps TSI items associated with low reliability here would not have low reliability when assessed with juveniles that do not have IDD. Or perhaps social negative reinforcement functions will be more common amongst adolescent students. One possibility, then, would be to devise different versions of the TSI for different populations (similar to Singh et al., 2006).

Interviews with caregivers or other persons that are familiar with potentially relevant antecedents and consequences of problem behavior are an important first step in the functional assessment process (Hanley, 2012). The current zeitgeist is to employ open-ended interviews such as the ISCAA (e.g., Curtis et al., 2020; Hanley et al., 2014; Jessel et al., 2016) as part of initial indirect assessment. The movement away from structured tools such as the QABF, FAST, MAS, and others was a reasonable reaction to reports of generally low reliability (Hanley, 2012). However, while practitioners must pose questions of one kind or another as part of initial assessment activities, the relative advantages of open-ended questions (e.g., IISCA) vs. structured questions (e.g., TSI) in terms of reliability, utility for structuring an FA, and predictive validity for FA outcomes, remain undetermined. This is particularly so with respect to stealing. For example, answers obtained via the TSI were used determine various aspects of the FAs including locations, items to evaluate via SPA for embedding during FA trials, and the kinds of

FA conditions included. Rather than using the TSI only in terms of the reinforcement category associated with the highest number of endorsements, the usefulness of structuring FA conditions based on single item, reliable endorsements could be explored in future investigations. For example, it is possible that two respondents might agree that an individual typically exerts great effort to avoid being caught for stealing (TSI item 18), even though the constellation of obtained item endorsements favored a category of social (rather than nonsocial) reinforcement. Such an outcome might reasonably lead to an examination of the covertness of stealing (Simmons et al., 2019). Anecdotally, while respondents sometimes gave potentially useful answers to the two TSI open-ended questions that precede the structured TSI items (e.g., indicating that thefts often occurred from a housemate's bedroom), they also offered functionally-ambiguous responses and sometimes described the thief's behavior rather than listing environmental events or conditions that might serve as relevant antecedents. Lastly, while Hanley (2012) criticized structured indirect assessment tools on global outcomes derived from questions requiring a simple yes or no answer (placing artificial limits on the kind of information received), a counterpoint would be that exclusively open-ended forms rely heavily on the ability of respondents to recall somewhat detailed information. By contrast, the kinds of structured questions on the TSI may serve as effective prompts for recalling relevant variables that might otherwise have been omitted. At any rate, the TSI incorporates both open-ended and structured questions.

A possible limitation of Study 1 concerns the omnibus nature of the nonsocial reinforcement category, which might comprise some idiosyncratic sources of reinforcement that combine in important ways with the effects of gaining access to items. If so, then perhaps additional consideration of the treatment implications will be warranted. For example, various forms of self-injurious behavior have been thought to be reinforced via access to specific kinds

of sensory stimulation leading to interventions theoretically matched to those influences (Favell, McGimsey, & Schell, 1982; Fisher, Lindauer, Alterson, & Thompson, 1998; Piazza et al., 2000; Piazza et al., 1998). Although the case was previously made that consideration of some instances of non-socially maintained stealing as thrill-seeking behavior was unnecessary for a minimally sufficient behavioral analysis (e.g., forming an initial hypothesis regarding the role of social vs. nonsocial reinforcement), perhaps it is overly conservative to rule out the potential usefulness of such a construct for informing treatment. It might seem that such a stance would entail the need to empirically demonstrate the role of autonomic nervous system effects in relation to stealing, differentiate those effects as thrill seeking (positive valence) vs. fear of getting caught (negative valence) or other factors, and finally altering the sensory effects within an intervention. However, such an approach may be both impractical and unnecessary. For example, in cases where thrill seeking is suspected as a MO based on reports from caregivers, perhaps potentially exciting activities (nominated by the target individual or her caregivers) could be pitted against other activities within a kind of competing items SPA (e.g., Groskreutz et al., 2011) with the results used to inform preventive strategies (e.g., arranging for access to preferred activities, exciting or otherwise, during anticipated periods of lessened supervision). Although Gover, Fahmie, and McKeown (2019) found some evidence to support the use of leisure items within environmental enrichment protocols that are matched to the supposed sensory properties responsible for maintenance of automatically-reinforced problem behavior, there are examples of effective interventions in similar cases that have not involved attempts to match sources of sensory reinforcement (e.g., Ahearn, Clark, DeBar, & Florentino, 2005). Thus, the importance of addressing thrill seeking, as it pertains to the treatment of a potential subtype of non-socially reinforced stealing, is not clear. Similarly, it is also unclear that effective

interventions for kleptomania, which some might construe as behavior maintained via automatic negative reinforcement (i.e., tension or anxiety relief upon stealing), are dependent upon addressing changes in autonomic nervous system functioning in relation to stealing opportunities.

A second potential limitation of Study 1 involves the aggregation of different stealing targets (food, money, electronics, etc.), which might obscure functional outcomes. However, it is not clear from the extant literature on stealing that different functions should be expected based on this factor. In fact, the uniformity of the TSI outcomes, largely supporting nonsocial reinforcement functions, seems to mitigate this concern. Anecdotally, respondents rarely offered caveats to their answers that might suggest alternative responses across stealing targets. Because all but three individuals in Study 1 reportedly stole items across multiple categories, excluding individuals with single target stealing would have severely restricted recruitment. Also, administering the TSI separately for multiple categories of stealing targets would have been unwieldly as about half of the current sample reportedly stole items from 4 or more categories.

While the structured items on the TSI were designed to reflect stealing functions applicable across various populations, recruitment was ultimately circumscribed in terms of participant characteristics and total sample size. Although the number of cases evaluated here is within the range of similar tool evaluation studies (*N*= 36 for Dawson, Matson, & Cherry, 1998; *N*= 45 for May et al., 2014; *N*= 40 for Nicholson et al., 2006; *N*= 20 for Shogren & Rojahn, 2003), evaluation of the TSI in other populations is warranted (e.g., juvenile delinquents, school-aged children without IDD, persons diagnosed with kleptomania, etc.).

Another limitation concerns potential ambiguity with respect to the functional classification of TSI items for social negative reinforcement. Specifically, peer pressure might

have a somewhat positive valence (as in a friendly dare or challenge) or a negative valence (e.g., coercion) suggesting the possibility of either positive reinforcement (e.g., if completion of the dare is applauded) or negative reinforcement (e.g., if coercion is terminated following theft), respectively. The phrasing of these items (7-12), though, was slanted toward a negative valence by describing EOs as demands, criticism, insistent requests, and even mistreatment. Stealing that recurs when it consistently terminates such EOs (item 8) suggests negative reinforcement. While the accuracy of these items in reflecting negative reinforcement contingencies when endorsed remains to be seen, similar treatment implications may arise. For example, extinction may not be viable because peers would be the natural contingency managers and might not cooperate. Given that positive reinforcement contingencies can sometimes effectively compete with negative reinforcement contingencies (Lalli et al., 1999; Slocum & Vollmer, 2015), an approach involving differential reinforcement of appropriate social skills might be applicable for either function. Such skills might include assertiveness and self-advocacy (Bates, 1980; Bornstein, Bellack, & Hersen, 1977; Sievert, Cuvo, & Davis, 1988; Test, Fowler, Wood, Brewer, & Eddy, 2005) in terms of thwarting or diverting peer pressure to steal and registering complaints or reporting coercive peer behavior or mistreatment.

Finally, the extent to which outcomes from the TSI and FAST can accurately predict FA outcomes for stealing is unknown and served as the impetus for Study 2. Because FA methods have not been applied to covert non-food stealing, Study 2 also entailed a comparison of the viability of two different FA models for determining stealing functions. Thus, questions of concern in Study 2 included (a) whether stealing functions, when not limited to food as targets, would be differentially identified across two FA models and (b) whether or not FA outcomes from each model would match the outcomes from Study 1 in terms of functions identified.

CHAPTER 4

METHODOLOGY (STUDY 2)

EVALUATION OF TOOL PREDICTIVE VALIDITY AND COMPARISON OF TWO GENERAL TYPES OF FA METHODS FOR IDENTIFYING STEALING FUNCTIONS

Method

Participants, setting, and trials.

A subset of 6 subjects (Table 9) from Study 1 were selected to participate in Study 2 based on several factors including comparatively high tool IRA scores and an aim toward sampling the most commonly suggested behavioral functions from Study 1. Additionally, logistical and financial factors were considered (e.g., participant location). The original intent was to sample one representative function type from each general category (e.g., a social positive reinforcement condition, a social negative reinforcement condition, and a condition devoid of social opportunities), but escape functions pertaining to aversive peer pressure were not clearly suggested by the TSI outcomes. Given these factors, an attempt was made to demonstrate multiple replications of the two most common general reinforcement contingencies suggested by the Study 1 outcomes (e.g., non-mediated access to items or access to adult attention). To maximize experimental control and minimize the likelihood of generalized inhibitory stimulus control during FAs, Study 2 host sites were asked to refrain from imposing any consequences for stealing that occurred either inside or outside the context of the experiment for the duration of each participant's involvement.

Mabel was 35 years old and reportedly stole food/drink, money, toys, clothing, baby supplies (e.g., diapers), and electronics from schools, stores, offices, churches, and her own home on a weekly to monthly basis. While her outcomes for each rater pair in Study 1 reflected

agreement with respect to the function suggested *within* each tool, Mabel's separate TSI (tool IRA= 83.3%) and FAST (tool IRA= 92.3%) outcomes conflicted suggesting nonsocial reinforcement and social positive reinforcement, respectively. Colten was 14 years old and reportedly stole food/drink, money, electronics, toys, and clothing on a weekly. Colten's outcomes for each rater pair in Study 1 reflected agreement on the function suggested within tools, but his TSI (tool IRA= 100%) and FAST (tool IRA= 86.7%) outcomes conflicted suggesting nonsocial reinforcement and social negative reinforcement, respectively. Lydia was 53 years old and reportedly stole food/drink, money, electronics, toys, clothing, and cosmetics on a weekly to monthly basis. Within each tool, item endorsement summations reflected rater agreement on suggested function for Lydia, but her TSI (tool IRA= 88.9%) and FAST (tool IRA= 80%) outcomes conflicted suggesting nonsocial reinforcement and social positive reinforcement, respectively. Jenson was 34 years old and reportedly stole food/drink and electronics on a daily to biweekly basis. Jenson's rater pair outcomes for the FAST (tool IRA= 85.7%) reflected agreement on a social positive reinforcement function and disagreement via the TSI (tool IRA= 77.7%), although the combined TSI rater scores suggested nonsocial reinforcement. Neither Jenson's outcomes for rater pairs within each tool nor his separate outcomes for the TSI (tool IRA= 77.7%) and FAST (tool IRA= 85.7%) reflected agreement with the former suggesting nonsocial reinforcement and the latter suggesting social positive reinforcement. Celia was 55 years old and reportedly stole food/drink, cosmetics, and other items (purses, rags/cloths, office supplies) from school, stores, work, and her home on a daily to weekly basis. Celia's outcomes both within and across tools reflected agreement with respect to a nonsocial function (TSI tool IRA= 83.3% and FAST tool IRA= 92.3%). Finally, Wyatt was 61 years old and reportedly stole food/drink, money, electronics, toys, and clothing on a weekly

basis. 6Wyatt's outcomes for each rater pair reflected agreement on functions suggested within tools, but his TSI (tool IRA= 88.9%) and FAST (tool IRA= 86.7%) outcomes conflicted suggesting nonsocial reinforcement and social positive reinforcement, respectively.

Across FA methods, test condition trials lasted 5 min and control condition trials lasted 2 min. Test conditions continued until stealing occurred on 1 trial or 3 trials were completed (whichever came first). Although such an abbreviated analysis might constrain the degree of confidence in behavioral function, it nonetheless permits a demonstration of the conditions under which stealing is likely to occur and offers a reasonable, objective means to confirm or disconfirm the instrument outcomes from Study 1. Further, an abbreviated analysis seemed justified in that it would (a) limit costs associated with item replacement, (b) be consistent with the strong likelihood of determining a nonsocial function, (c) align with the preliminary nature of the investigation of assessment methods for stealing, and (d) perhaps appeal to practitioners due to efficiency.

Each participant completed Study 2 within one week. FA trials for the two models were completed on two separate days.

Stimulus preference assessment (SPA).

To determine items for embedding during the FAs, low-cost items that the participants had reportedly stolen (based on results of the TSI from Study 1) were evaluated alongside other items within several stimulus preference assessments (SPAs). In some instances, items reportedly stolen by participants after completion of Study 1 were also included in the SPAs. Other items incorporated into the SPAs included things similar to those reportedly stolen along with items of unknown preference value (some of which were thought to have at least some value, while others were thought likely to have no value). To establish a preference hierarchy for

items to embed, seven leisure-based (or nonedible) items were evaluated using the multiple stimulus without replacement (MSWO) method described by DeLeon and Iwata (1996). While seated at a table, participants were instructed to pick one of the items arranged in a horizontal line directly in front of them. Upon selecting an item, participants were given 30 s to manipulate or consume items selected before moving to the next trial. After 30-s, the item selected for that trial was not be replaced and the item at the far left of the array was moved to the far right of the array. If no item was selected within 30 s, the trial (and the session) was terminated. Following the MSWO assessment for nonedible items, the same procedure was employed to evaluate edible and drink items (see DeLeon, Iwata, & Roscoe, 1997; Bojak & Carr, 1999). For the MSWO assessments, items associated with relatively greater percentages of selection (defined as any physical contact with an item) across trials were considered preferred. More specifically, the item with the highest selection percentage was considered an HP item, and items with the second and third highest selection percentages were considered MP items. Items ranked last or next to last in selection percentage were considered LP items. To determine items of low (or no) preference value (LP), a single-stimulus preference assessment was then completed using methods described by Pace, Ivancic, Edwards, Iwata, & Page (1985). Briefly, the same or similar sorts of items used in the MSWO assessment were presented one at a time to participants. If a participant approached an item, access to it was permitted for up to 30 s (although participants were permitted to return items prior to the end of the 30-s access period). If an item was not approached within about 5 s, then the participant was prompted to sample it. Following the prompt, if the participant still refrained from approaching the item it was removed and the next item was introduced. Three consecutive single-item sessions were completed using a counterbalanced order of item presentation such that each item was presented a total of 3 times.

For the single-item SPA, preference was determined by percentage of trials for which items were approached (defined as movement of the hand or body towards the item). Specifically, items not approached during the single-item SPA were considered LP. Finally, in part because the single-item SPA did not adequately differentiate HP from LP items, a free-operant SPA (Roane, Vollmer, Ringdahl, & Marcus, 1998) was completed. Sixteen to 18 items were arranged on a table or desk directly in front (and in reach) of the participant who was given free access to manipulate any or all items (or none) for 5 min. No prompting or feedback was provided. Item preference for the free-operant SPA results was determined based on the percentage of 10-s intervals in which items were manipulated. Items ranked first in terms of selection percentage were considered HP items and items selected during 10% or less of the intervals were considered LP items.

Across 100% of SPA trials and all SPA methods, an independent observer (a second-year graduate student in an ABA program with a BACB verified course sequence) independently scored item selections (MSWO), item approaches (single stimulus SPA), and item manipulation free operant SPA). For the MSWO and single stimulus SPAs, agreements (e.g., both observers recorded that the same item was selected on the same trial for the MSWO or both observers recorded that an item was approached on the same single stimulus SPA trial) were determined on a trial-by-trial basis and were divided by the total number of agreements and disagreements, multiplied by 100% (interobserver agreement or IOA). For the free operant SPA, IOA was determined by comparing agreements and disagreements with respect to the occurrence and nonoccurrence of manipulation for each item within each trial, summing the resulting proportions across all 30 intervals, and then dividing the final summed proportion. For example, in a given interval, if both observers recorded that a phone and a radio were manipulated

(occurrence), disagreed that a stuffed animal was manipulated, and agreed that 7 other items were not manipulated (nonoccurrence), then the agreement proportion was 9/10 or 90% for that interval. If this proportion remained constant across all trials, then the final agreement score would also have been 90%.

Across all participants and SPA methods, IOA scores ranged from 95% to 100%.

FA procedure.

Response measurement and reliability.

For the attention condition and control condition trials of the FA, the primary observer (who also served as therapist) and the secondary observer were both present with the latter positioned unobtrusively in a corner. The secondary observer withheld all comments and attention during attention condition trials, but she responded to participants' inquiries during the control condition. For these conditions, occurrence versus nonoccurrence of stealing was determined by direct observation during trials and verified via post-trial checks for permanent products. For direct observation during the attention condition, stealing was defined as grasping, holding onto, or otherwise taking possession of an embedded item without obtaining permission and with subsequent concealment and/or consumption. For example, stealing would have been scored if a participant placed embedded coins into his pocket or had placed an embedded snack item into his mouth but not if the item were touched or manipulated without concealment.

An inventory list of all items to be embedded was compiled prior to trials. Post-trial measurement of stealing, as occurring or not occurring, was accomplished via determination of permanent products (i.e., absence of any embedded items). That is, at post-trial, any items from the inventory list found to be missing were recorded. If no items were found missing, then a 0 was recorded. Thus, stealing was recorded as occurring if (and only if) one or more items were

found missing. The resulting data were graphed dichotomously as occurrence or nonoccurrence of stealing for each consecutive trial. For at least 72.2% of FA trials distributed nearly equally across FA models, the previously described independent observer conducted pre-trial and post-trial inventory checks for embedded items to establish reliability. This was accomplished by having each observer separately (one at a time) enter the room or area with the embedded items after the participant had vacated. After the observers completed their separate inventory checks, they recorded the occurrence or nonoccurrence of stealing (i.e., whether any listed items were found missing) and the data sheets were compared to determine agreement. Specifically, across trials, the number of agreements on stealing occurrences and non-occurrences were divided by the total number of agreements and disagreements thereof to determine IOA. Across all trials and both FA methods for all participants, IOA for stealing was 100%.

Rationale and considerations in the determination of FA methods for stealing.

One aspect of Study 2 involved efforts to examine the viability of two different approaches to experimentally determining the conditions under which stealing is likely to occur. A second aspect of Study 2 involved examining the predictive validity of the instrument outcomes from Study 1 (modeled after Study 2 of Iwata et al., 2013). Generally, this was accomplished by exposing individuals to various conditions of the two FA approaches and comparing each participant's results to his or her respective instrument outcomes from Study 1. Although Iwata et al. (2013) used procedures commonly reported during FAs (based on Iwata et al., 1982/1994), logistical and ecological issues suggest the need for procedural adaptation when assessing stealing. For example, Iwata et al.'s (1982/1994) model is based on a free-operant paradigm wherein repeated instances of problem behavior are evoked and reinforced during sessions until stable and differentiated rates emerge across conditions. Stealing, by contrast, may

be viewed as a restricted operant in that individuals have limited opportunities to steal, limited time frames per opportunity (if they wish to avert detection), and limited theft targets (as potential reinforcers) per opportunity. Also, where individuals steal money or items beyond nominal value (e.g., several new music CDs, packs of cigarettes, articles of clothing, etc.), arranging for repeated within-session theft opportunities could be cost prohibitive. Concerns regarding ecological validity also arise in the sense that repeatedly swiping items over an extended period may not accurately reflect most individuals' natural approaches to stealing.

A kind of trial-based FA method (Bloom et al., 2011; Lambert et al., 2012; McCord, Thomson, & Iwata, 2001) may address some of the concerns discussed above regarding an FA of stealing. In Bloom et al.'s model, participants were exposed to 2-min FA trials in a fixed sequence of control-test-control in natural classroom settings. Contingencies for problem behavior were absent during control conditions, which were matched to each test condition. For example, when evaluating attention as a maintaining variable, control segments included continuously delivered attention and free access to a moderately preferred leisure item, while the test segment involved restricting access to attention and delivering it only upon occurrences of problem behavior. Similarly, for evaluating a tangible function, access to a preferred tangible item was given freely during control segments and restricted until problem behavior occurred during the test segment. When examining escape as reinforcement, demands, task materials, and leisure items were absent during control segments and the test segment involved presentation of task demands that were terminated contingent upon problem behavior. Lastly, to examine the possible role of automatic reinforcement, three consecutive (2-min) ignore trials were completed in the absence of the availability of task materials, leisure items, and attention from others. An occurrence of problem behavior terminated a segment such that each trial was essentially a "one

and done" affair (consistent with the restricted operant nature of stealing). Bloom et al. reported that their trial-based FAs matched or partially matched (in one case) the results of traditional FAs (Iwata et al., 1982/1994) for 7 out of 10 participants. Based on concerns about the carry-over of problem behavior from test to control segments in Bloom et al., Lambert et al. (2012) omitted the final control segment and demonstrated differentiation between the control-test sequences of one or more conditions compared to others for three participants. Further, the hypotheses derived from the trial-based FA results presented by Lambert et al. were supported via successful applications of matched, function-based treatments.

Although trial-based FA methods warrant consideration for application to stealing, further consideration suggests the possible need for procedural modifications to Bloom et al. (2011) and Lambert et al. (2012). One adaptation may stem from the need for participants to vacate the room or area for several min after a designated duration to permit recording of permanent products and to replenish embedded items. Thus, whereas previous iterations of trial-based methods have arranged somewhat seamless transitions between trial segments (with no or minimal delay), this may not be feasible as applied to stealing. So as to capitalize on EO effects (suggested by Bloom et al.) and to minimize costs associated with replacing stolen items, test condition trials might need to be extended in duration and the number of repetitions per condition might need to be restricted. Another consideration, not limited to the trial-based FA method, pertains to the number of items to embed and how to place or stage them. On the one hand, a relatively large number of embedded items might enhance the likelihood of stealing. On the other hand, a verbally competent individual may gage that she is unable to effectively conceal multiple or large items, potentially inhibiting stealing. Embedding small items seems desirable, then, and is consistent with reports suggesting that thieves often target small, low-

value items (e.g., Arboleda-Florez et al., 1977; Buckle & Farrington, 1984; Grant, 2006; Lo, 1994; Moore, 1984).

One dimension along which FA's have varied in the research literature is the extent to which sessions or trials have been conducted under conditions viewed as more or less naturalistic. For example, Iwata et al. (1982/1994) completed their analog FAs of self-injurious behavior at a university-based hospital in a dedicated therapy room that was connected to an observation room equipped with a one-way mirror. This approach permits careful control of reinforcement contingencies and extraneous variables including evaluation of behavior under "true alone" conditions (i.e., absence of therapists that might serve as discriminative stimuli for the availability of attention). As such, a primary advantage of analog FA environments concerns the degree to which changes in the rate of problem behavior (dependent variable) can be attributed to the EOs and consequences manipulated (independent variables) during test conditions. While some authors (e.g., Conroy, Fox, Crain, Jenkins, & Belcher, 1996; Martin, Gaffan, & Williams, 1999; Sturmey, 1995) have questioned the ecological validity of analog FAs (in terms of the degree to which outcomes are reflective of naturally-occurring contingencies for problem behavior in relevant environments), this model remains widely used by researchers and has led to many successful treatment demonstrations (Beavers et al., 2013; Hanley et al., 2003). In their review of 158 FA studies published between January 2001 and May 2012, Beavers et al. (2013) reported that 78.5% were completed in either hospital (inpatient) or outpatient clinic settings (where dedicated therapy or analog FA rooms might be available). Similarly, Hanley et al. (2003) reported that 65.4% of the 277 FA studies they reviewed occurred in hospital, institution, or outpatient clinic settings. Despite the prevalence of analog FA approaches, they may have disadvantages in terms of omitting features of the natural environment that may be

discriminative for or otherwise correlated with problem behavior including physical aspects of the setting and persons present. For example, Ringdahl and Sellers (2001) reported clearer FA results when sessions were conducted by caregivers. In some cases, whether by necessity or by design, researchers have also conducted FAs in natural (and naturalistic) settings. Of the FA studies reviewed by Hanley et al. and Beavers et al., naturalistic settings including homes, schools, and vocational programs were employed in 41.2% and 66.4% of the studies, respectively. Hanley et al., in their review, acknowledged that the issue of relative efficacy and efficiency between analog and more natural settings for FAs was unsettled, but nonetheless suggested constructing FAs so as to include as many aspects of the natural environment as possible without compromising experimental control.

Given the aforementioned background, a primary point of comparison for the current study involved the extent to which stealing can be evoked under naturalistic vs. analog conditions. Although the term natural might apply to other procedural features (e.g., the manner of staging embedded items), it was used here primarily in relation to the types of locations where stealing had previously occurred. Therefore, a naturalistic FA method was considered to be one consistent with the setting where individuals had previously stolen things. Item staging was based on information obtained via the TSI or via soliciting recommendations from staff persons at the time of the FA. With the exception of Colten, participants reportedly stole things from their own homes (usually from housemates) and their respective homes served as the location for the naturalistic FA. Colten reportedly stole primarily from his usual therapy room at an outpatient clinic, and his naturalistic FA trials were conducted there. Consistent with the approach reported by Switzer et al. (1977), and because it may be unusual for more than a few preferred stealing targets to be left unattended in supervised home settings, only two items were

embedded per trial during naturalistic FAs. To enhance the likelihood of evoking stealing during the naturalistic FA, a ruse was employed in order to facilitate encounters with embedded items. This sometimes involved requesting that a participant watch TV in the living room (after items had been covertly embedded) while the therapist met with the staff person in a separate area of the home (like an office room with the door closed). This latter feature was designed to mitigate effects of inhibitory stimulus control over stealing. Possible advantages of the naturalistic FA model used here include ecological validity (approximating naturally occurring stealing opportunities and capitalizing on likely established discriminative stimuli), simple set up, and perhaps cost savings associated with embedding only two stealing targets per trial. Potential disadvantages of such an approach include uncertainty regarding the effectiveness of the ruse (e.g., participant cooperation), possible item detection issues (unless targets are prominently staged, which could "tip off" participants as to the nature of the assessment), experimental control issues (e.g., variations in responding across trials might be attributable to variations in staging, locations, ruses, actions of non-participants, etc.), and lack of control over items participants may possess at the time of trials (a potential AO for stealing). Also, as previously discussed, Switzer et al. (1977) reported difficulties with the efficient establishment of baselines when multiple items (staged in pairs) were embedded across various natural locations in a school setting.

Although naturalistic approaches to locations for embedding and staging have strong precedence (e.g., Henderson, 1983; Ingamells & Epston, 2013; Switzer et al., 1977; Tremblay & Drabman, 1997), analog embedding approaches have met with some success (e.g., Maglieri et al., 2000; Page et al., 1983a/1983b) and may offer important advantages such as permitting efficient baseline establishment (e.g., via more salient staging) and perhaps greater attributional

confidence (i.e., the ability to rule out non-targeted individuals as culprits of stealing), among others. With an analog FA approach, a consistent ruse might be employed with a built-in rationale for an individual to enter an area where a number of items have been embedded and to engage in some manner with those items (perhaps increasing the likelihood of stealing). To minimize cost concerns, perhaps a few of the embedded items would be fairly inexpensive MP items or HP items while other items would be of LP value (i.e., unlikely to be stolen). Advantages of such an approach would include facilitating timely encounters with embedded items, elimination of item detection concerns, possible increased likelihood of stealing due to inclusion of more than two items, perhaps stronger experimental control, absence of the need for multiple believable ruses, consistent set-up across trials and participants, and the ability to influence what items participants bring to trials that could serve to abolish the motivation for stealing. Potential disadvantages of this analog approach include diminished ecological validity (i.e., may involve arranging an atypical context), potential costs of embedding and replenishing multiple embedded items per trial, more involved set up, and uncertainty regarding participants' cooperation with the standard ruse.

For purposes of the current investigation, an FA model that is relatively analog was compared to a more naturalistic FA model similar to Bloom et al. (2011) and Lambert et al. (2012). Attempts were made to hold most procedural aspects of the two approaches constant including trial durations, maximum number of trials per condition, types of items embedded, and types of test and control conditions employed. Separate ruses were used to facilitate item manipulation and discovery across the two FAs models. Because the analog FA model was somewhat novel, further elaboration will be given here.

General procedure for the analog FA. Participants were given a temporary ostensive job in a relatively barren room (free of non-embedded items likely to be stolen). Work was performed in exchange for a non-monetary reward or privilege determined in consultation with staff persons and host site management personnel. Such rewards included things like special community outings (e.g., to a fast food restaurant) and preferred snack choices, etc. The ostensive job involved filling gift bags for others (not specifically identified) with various items. Items for bagging included things that the individual had reportedly stolen in the past and other items identified via caregiver interviews (TSI) and stimulus preference assessments (SPAs). To keep the number of opportunities to steal constant (Switzer et al., 1977), twelve items were embedded per session and four gift bags were provided. To minimize costs and to avoid presenting an unfair challenge to participants (due to inclusion of high cost items), embedding was accomplished with mostly previously used items of low value (e.g., The Chronicles of Narnia DVD, an obscure PlayStation® 2 video game, a CD, etc.) or little value (e.g., wash cloths, rags, pencils, paper, blouses, a door stop, etc.), some of which were clearly non-functioning (including an iPhone 4s with a severely cracked screen and a Samsung BlackJack phone missing its battery and cover). While most of the items used were donated to the project, some low-cost items were purchased by the primary investigator (e.g., Powerade®, hand sanitizer, diapers, Liquid Paper®, a birthday candle, etc.). As a mitigating factor when considering the overall costs of items either purchased for or donated to the project that might be stolen, the likely demand characteristics of the ruse (i.e., job completed under some level supervision, particularly during test and control conditions for social reinforcement), were such that a verbally-competent individual with some degree of rule-governed behavior and self-control was unlikely to steal

more than a few items per trial. In fact, this turned out to be the case. For example, no electronic (or related) items were stolen during the project.

As an MO manipulation, participants were asked to refrain from bringing snacks, drinks, money, or leisure items to trials. Participants found to have any such items would have been asked to store them outside of the work area until the work was finished. Also, given a suitable indoor climate, participants were encouraged to wear a jacket or coat with pockets during trials (to set the occasion for stealing via item concealment). Participants were told (and, prior to the first trial, shown how) to fill each bag with about the same number and kinds of items (from the items stored in the larger container) until all items had been bagged. After the bag-filling instructions were given, the therapist announced an intention to leave for 5 min (while the participant worked with the door closed, for privacy). The participant was instructed to remain in the room until a timer alarm (set by the therapist) sounded and then to exit the room independently to a waiting area (for example, a reception area at the office building of a host site). The therapist and another observer (when present) remained outside of the room (and out of sight) to ensure that no one else entered the work area and to direct the participant back to the room if needed (e.g., if 5-min have not elapsed), although this never occurred. No performance-related feedback was offered to participants following trials and their actions were not directly monitored during the between-trial period (except by the accompanying staff person). Also, after trials (when the participant had left the room or area), the therapist and secondary observer (separately, one after the other) entered the work area to cross-check the items that were placed into the gift bags against the pre-trial inventory list. This included, as necessary, a thorough check of all areas of the room to ensure that any items missing from the inventory list were not simply dropped or moved to a different location in the room (as opposed to stolen).

Analog FA conditions.

Test conditions evaluated were determined based on the functions suggested via Study 1 instrument outcomes. Because neither the FAST outcomes nor the TSI outcomes suggested a possible role for social negative reinforcement contingencies (e.g., contingent escape from task demands or contingent termination of inducements, etc.), FA conditions designed to evaluate such functions were omitted.

Alone (test for nonsocial or automatic reinforcement). Participants completed their job in isolation (without the presence of others). To the extent that stealing was maintained via access to the item stolen without social mediation, stealing was expected to occur when HP (or perhaps MP) items were embedded (presumably, items previously stolen would fit into one of these categories). Therefore, embedded items included the same 4 HP (or MP) items and 8 LP items. LP items served as controls against which stealing of HP/MP items could be compared, as well as to contribute to the overall ruse. No specific work-related feedback was offered, and no consequences were provided for stealing.

Attention (test for social positive reinforcement). Although the limited extant literature suggests that stealing may sometimes be maintained via delayed contingencies such as when counseling or verbal reprimands are delivered only after stealing is discovered after-the-fact (e.g., Wetzel, 1966), the available participant pool here consisted of individuals that did not seem to fit such a profile. For example, the current participants had been caught in the act of stealing by at least one or more staff persons on multiple occasions in the previous 12 months. Therefore, an evaluation of the effects of delayed access to attention was not undertaken.

The preference value of embedded items should be relatively unimportant if stealing is reinforced by access to the attention of others, so only LP items were embedded. Prior to trials,

the therapist interacted with the participant for about 20 s concluding with a statement indicating that the therapist would be busy for about 5 min. Then, the therapist remained in the room with the participant, pretended to be busy (e.g., writing notes or reading a form), and withheld further attention unless stealing occurred. Contingent upon stealing, trials would have been terminated and the therapist would have provided counseling and mild admonishments to the participant (e.g., "Why did you take that?" or "You know stealing is not appropriate", etc.) for 1 min. A second observer was situated unobtrusively in a corner of the room and remained quiet.

Control (for social positive reinforcement). Control conditions offer a contrast to test conditions and are designed to minimize occurrences of problem behavior through the exclusion of EOs and reinforcement contingencies relevant to potential maintaining variables for problem behavior. In essence, the control condition should offer an example of the conditions under which the behavior of interest is unlikely to occur. Therefore, a suitable control condition for stealing maintained by access to various forms of social positive reinforcement would involve free access to positive reinforcers in the context of embedded LP items. Thus, during control trials, the therapist provided continuous social interaction to the participant, while the participant was given free access to MP items (clearly designated by the therapist at the trial outset and set apart from the embedded items). Attempts to steal any of the 12 embedded items would have been ignored. Control condition trials always followed social positive reinforcement test condition trials due to concerns that access to positive reinforcers in the former might suppress stealing in the latter via AO effects (e.g., Berg et al., 2000; Hammond, Iwata, Rooker, Fritz, & Bloom, 2013; McComas, Thompson, & Johnson, 2003).

Naturalistic FA conditions.

As with the analog FA method, condition-correlated stimuli were omitted. Trials occurred in the homes of participants based on information obtained via the TSI indicating that all participants had stolen in this setting (even if other settings were also implicated). Two items (as in Switzer et al., 1977) were embedded in one of multiple locations within participants' homes (determined in consultation with staff) including on dining room tables, office desks, kitchen counters, and coffee tables, etc. Locations varied in a semi-random manner across trials. Embedded items were staged in a manner designed to facilitate discovery by participants (e.g., due to placement proximity or other salient features). Further, a ruse was employed in which participants were asked to sit in the same room or area where items were embedded. For example, if items were embedded on top of the kitchen counter, then participants were asked to sit at the kitchen table or nearby. For staging, items were sometimes left protruding from a purse situated near where the participant was to sit (based on information from staff suggesting that this was consistent with the participant's previous stealing practices). The same sorts of items embedded in the analog FA were embedded in the naturalistic FA. Also, for the alone condition only, item pairs (determined in advance) were changed across trials. That is, if no stealing occurred in the first trial, a different pair of items (of the same preference value) was embedded for the next trial.

Alone (test for nonsocial or automatic reinforcement). Two HP items (or 1 HP item and 1 MP item) were embedded in rooms or areas where only the participant would be present (i.e., without immediate supervision or the possibility of gaining attention from others) and few if any competing leisure items or activities available. Sometimes, this latter feature required temporarily relocating items (e.g., bottles of water, office supplies, etc.) away from the

assessment area. As part of the ruse, participants were told that the therapist and data collector would be meeting with the staff person (and others, if present) in a separate area away from the embedded items. For example, the therapist and data collector sometimes waited with the staff person in a home office with the door closed while the participant remained in the living area where items were embedded. Participants were asked to remain in the area with the embedded items until a timer alarm sounded indicating the passage of 5 min. Participants were also instructed that, upon hearing the alarm, they should go to a different (isolated) area and wait for further instructions. Typically, the isolated area was a participant's bedroom (a location where all participants had a reported history of hiding stolen items). Moving to an isolated area (i.e., bedroom) afforded an opportunity for participants to conceal stolen items following trials. After giving these instructions, the therapist activated the timer and vacated the embedded room or area. At the expiration of the 5-min timer, the participant was given up to 1 min to move to another area without immediate supervision before verbal prompting was given by the therapist, who remained out of sight. No consequences were administered for stealing. Because terminating a trial contingent upon stealing might have produced unintended effects on subsequent responding, trials were not terminated at the point of stealing (i.e., all trials lasted the full 5 min). Consistent with Bloom et al. (2011) and Querim et al. (2013), three consecutive test trials were completed without alternating control trials.

Attention (test for social positive reinforcement). To initiate these trials, the therapist spoke to the participant for about 20 s (including stating that the therapist had work to do before turning away from the participant to engage in the ostensive work). The therapist remained with the participant in the same room or area where the item was embedded. The therapist and data collector avoided eye contact and withheld all forms of attention from the participant. If the

participant had grasped an embedded item and attempted to conceal it (e.g., placing it into his pants pocket or inside of his jacket), the therapist would have delivered 1-min of attention to the participant in the form of mild reprimands and counseling (as specified for the analog model).

Escape (test for social negative reinforcement). Only one participant (Colten) experienced the escape condition based on Study 1 outcomes. Specifically, staff persons interviewed in Study 1 indicated that Colten stole items in the context of completing academic worksheets (which entailed reading short passages and writing a brief summaries of the passages). Within a trial, Colten completed one or two such assignments. Following the initial instruction, the therapist periodically provided verbal prompts urging task completion (e.g., "Keep reading" or "You need to write another sentence"). Compliance was met with brief verbal praise. Contingent upon stealing, the demands (and the trial) would have been terminated.

Control. During control trials, the therapist or other adult delivered continuous attention (e.g., social comments or comments pertaining to academics or work) and no task- or instructional-related demands were presented. Participants had access to several clearly designated, MP items (made available for use or consumption) in the context of 2 LP embedded items. No consequences were scheduled for delivery in the event that stealing occurred (i.e., the therapist or other adult would have continued to make comments that were unrelated to stealing). Control trials always followed test trials.

Modified alone (test for nonsocial reinforcement). An additional extended alone condition trial was devised for participants that did not steal during either FA type. Due to logistical concerns related to the pandemic, only Jenson was exposed to this trial and the delay between his initial FAs and the modified alone trial was about 6 months. To maximize the likelihood of responding, trials lasted 30 min and twelve low-cost items (including HP items and

items reported as previously stolen via TSI administration) were embedded in the living area of Jenson's home. In a semi-random fashion, items were placed on a coffee table, an end table, and other surfaces situated near the couch. To increase anonymity and mitigate potential effects of inhibitory stimulus control related to the presence of relatively unfamiliar persons, efforts were made to prevent contact between participants and the researcher. Specifically, the researcher embedded items after the participant (under supervision) had vacated the home. After items were embedded, the researcher covertly exited the participant's home and waited out of site. Next, the researcher instructed the participant's home supervisor (via text message) to escort the participant back into the home and to begin implementing a script of steps that included (a) asking the participant to engage in activities in the living area where items were embedded (to facilitate item discovery), (b) informing the participant that she (the supervisor) would be doing paperwork in a separate room or area, (c) instructing the participant to remain in the living area until a timer alarm sounded (set by the supervisor) and then to independently go to his bedroom (to permit post-trial measurement of permanent products), (d) notifying the researcher via text message once the participant was alone in the living area with embedded items, (e) refraining from interacting with or delivering consequences to the participant for stealing (beyond directing the participant back to the room or area with embedded items, if needed), and (f) briefly and covertly checking on the status of the participant after 15 min had elapsed. The latter step was consistent with the agency's policies. When the supervisor texted the researcher and indicated that the participant was alone in the room or area with the embedded items, the researcher activated a timer alarm set for 30 min and replied to the supervisor via text with a reminder to follow the script and wait for the researcher's return to the home. About one week prior to the trial, the script (see Appendix D) was provided to the supervisor and didactic training was

providing via a phone call (with the researcher). This training included reviewing each step, checking for understanding, clarifying steps as needed, and requiring the supervisor to accurately (vocally) answer questions about the steps. During this phone call, the supervisor was also instructed to ensure that only she and the participant would be present for the trial and that certain conditions would warrant abandoning the trial including any crises or emergencies, the entry of any other persons into the home, and refusal of the participant to remain in the area where items were embedded. In regards to the latter, criteria specified for terminating the trial included the participant approaching the supervisor (in sight) or entering rooms or areas away from where the items had been embedded more than 3 times or lingering in these areas for longer than 1 min on any one occasion. The supervisor was also instructed to review the script (devoid of identifying information) during the trial to use as a textual prompt (upon returning to the home with the participant after items were embedded). Lastly, the researcher contacted the supervisor via phone call the day prior to the trial to review the above information.

A comparison of general characteristics of each FA model is presented in Table 10, and a summary of procedures employed across FA conditions is shown in Table 11.

Order of FA approaches and conditions, trial repetitions, and experimental design.

Using a counterbalanced order of exposure to the two FA approaches, the second FA began within 1 to 7 days of the first FA (consistent with Bloom et al., 2011). A risk in beginning the FA with trials involving attention (e.g., questioning and mild reprimands) delivered contingent upon stealing is that stealing may be eliminated (i.e., punishment may occur) and the effects of inhibitory stimulus control may persist such that stealing cannot be further evoked. Therefore, participants were first exposed to test trials devoid of social contingencies for stealing (similar to the screening model demonstrated by Querim et al., 2013) across both FA approaches.

This format is also consistent with the assumption that most cases of stealing likely involve maintenance via non-social reinforcement. Following test trials for nonsocial reinforcement, a second phase was completed in which trials involving scheduled contingent access to attention were alternated with control trials (tailored to stealing possibly maintained by access to attention). As in Bloom et al. (2011), trials in which errors involving the relevant EO or contingency occurred were discarded and repeated. Examples of errors that would have terminated trials include (among other things) inadvertent or unplanned provision of attention during test trials for nonsocial reinforcement or prior to an occurrence of stealing during test trials involving contingent access to attention. Such errors occurred only twice and involved (a) the therapist starting the wrong type of trial (e.g., control condition instead of test condition) before abandoning it within about 10 s to 20 s of trial initiation and (b) delivery of attention from a housemate during the attention condition of one participant's naturalistic FA. For each social test condition phase, an abbreviated multielement design was employed in which the test and control trials were alternated in a pairwise format (Iwata, Duncan, Zarcone, Lerman, & Shore, 1994b).

Procedural Integrity. The secondary observer also recorded data on the fidelity with which FA procedures were implemented including trial duration, correct embedding of items (in terms of the number of items and their identified preference value relative to the condition), pre-trial instructions, EOs (e.g., withholding attention during the attention condition unless and until stealing occurred), providing of MP competing items during the control condition, and delivery of consequences. The number of procedural aspects conducted correctly was divided by the total number of procedural aspects recorded to generate a procedural integrity score. Across all trials

and both FA models, procedural integrity scores, evaluated on 43.8% to 100% of trials (dispersed fairly evenly across FA models), ranged from 97.5% to 100%.

Data interpretation and outcome comparisons. Data were evaluated with respect to (a) whether or not each FA model yielded an outcome suggesting a function for stealing, (b) whether or not outcomes for each model matched the suggested functions in Study 1 (via the FAST and TSI), and (c) whether or not the outcomes from one FA model matched the outcomes of the other FA model. For example, with respect to (a), stealing that occurred differentially in a particular FA test condition for a given model would suggest that that model was viable for identifying a stealing function. With respect to (b), a match would be reflected if the TSI suggested a nonsocial function and stealing occurred differentially in the alone condition of a given FA model. Failure to match would be observed, for example, if the TSI (or FAST) suggested a social reinforcement function but stealing occurred only during the alone condition of a given FA model. Finally, for (c), if stealing occurred in the same test condition for both FA models, then a match occurred.

CHAPTER 5

RESULTS AND DISCUSSION

Data for participants whose FA outcomes supported stealing maintained by nonsocial reinforcement will be reviewed first. As shown in Figure 4, Mabel selected Cheetos® on 83.3% of trials during the MSWO for consumables resulting in this item being considered HP. Goldfish® crackers (33.3%) and Ranch® Dip (29.4%) were the next highest ranked items and were designated MP, and black olives were never chosen (LP). Compared to the MSWO for consumable items, Mabel's MSWO for non-consumable items resulted in a much less distinct preference hierarchy. Specifically, the identified HP item (pajamas) was selected on 26.3% of trials while the identified MP items (iPhone 4s, glue with paper, and Scotch® Tape) were selected on 25% and 22.7% of trials. Out of the 16 items presented, Mabel failed to approach only the stickers (33.3%) during the single stimulus SPA and this item was considered LP. Lastly, Mabel manipulated diapers during 30% of the free operant SPA trials and this served as her HP item, while First Keys toy (23.3%), a baby blanket (23.3%), and pajamas (16.7%) were considered her MP items. The remaining items in the free operant SPA hierarchy were designated as Mabel's LP items. Overall, items designated as HP or MP for Mabel were consistent with items identified via the TSI as things she had previously stolen (an exception being glue). Hand sanitizer, though reported as something Mabel had previously stolen, was manipulated during only 3.3% of the intervals (free operant).

Mabel's FA data are depicted in Figure 10 (top). As determined via post-trial checks of permanent products, Mabel stole 2 out of 3 embedded diapers during the third trial of the naturalistic FA and did not steal any items during the pairwise analysis of attention condition trials vs. control condition trials. As such, it was concluded that Mabel's stealing was

maintained via non-mediated, direct access to the items stolen (i.e., nonsocial reinforcement). Anecdotally, Mabel's staff persons subsequently reported that Mabel had hidden the diapers in her bedroom. The determination of a nonsocial function via the naturalistic FA for Mabel matched the results of her TSI outcome but not her FAST outcome. The determination of a nonsocial function via the naturalistic FA was not replicated, though, via the analog FA. Because of the absence of stealing during the analog FA, a determination regarding matching with the Study 1 outcomes of the TSI and FAST could not be made (i.e., inconclusive).

During Colten's MSWO for consumables (Figure 5), he selected Reese's® on 100% of the trials and this was designated a HP item. Chips Ahoy! and Doritos® were selected by Colten on 50% and 33.3% of the MSWO trials, respectively, making them MP items. Neither dill pickles nor olives were selected by Colten on any trials making them LP items. As with Mabel, Colten's MSWO results for non-consumables reflected a less distinct hierarchy compared to his MSWO results for consumables. The iPhone 4s, selected on 37.5% of the MSWO trials for non-consumables, was considered Colten's HP item. Colten selected the fidget spinner, cellphone speaker, and door stop on 33.3% of trials and the remote control on 23.1% of trials (all considered MP). By contrast, Colten selected dental floss on only 13% of trials (LP). Colten approached all items presented during the single stimulus SPA such that no preference designations were indicated. Finally, in the free operant SPA, Colten manipulated the fidget spinner during 80% of the intervals (HP) and he manipulated the door stop during 6.7% of intervals (MP). Paper clips, a 9V battery, a birthday candle, and a damaged iPhone 4s were all manipulated by Colten during 3.3% of intervals (MP). None of the 12 other items were manipulated during Colten's free operant SPA and they served as LP items. As with Mabel, items identified as HP or MP for Colten were mostly consistent with items he had previously

stolen (based on information gathered via TSI) including the iPhone 4s, fidget spinner, and Doritos®. On the other hand, Colten's free operant engagement percentage (0%) with the remote control was somewhat surprising given that he reportedly had stolen remote controls in the past. Also, Colten's selection and engagement with a door stop (MP) was surprising as this was not an item he was reported to have previously stolen.

Colten stole the fidget spinner during the second trial of the naturalistic FA and did not engage in stealing during either pairwise analysis of social test conditions vs. control conditions (Figure 10, bottom). Therefore, Colten's stealing was presumed to be maintained via nonsocial reinforcement. Because Colten's TSI outcome also suggested a nonsocial reinforcement function, his naturalistic FA outcome matched his TSI outcome. Colten's FAST outcome from Study 1 suggested a social negative reinforcement function (i.e., escape from academic tasks), so his absence of stealing during the pairwise analysis of escape condition trials did not match his FAST results. Consistent with Mabel's results, the determination of a nonsocial function via the naturalistic FA was not replicated via the analog FA. The absence of stealing during Colten's analog FA prohibits a determination of the degree of match between those results and his Study 1 outcomes for the FAST and TSI.

Lydia's SPA results are shown in Figure 6. Lydia selected black olives during 38.5% of the MSWO trials for consumables making this her HP item. Funyons® and Caprisun® were selected by Lydia on 29.4% and 23.8% of the trials, respectively (consistent with MP), and she selected the cookie (LP) on 15.6% of the trials. For the MSWO with non-consumables, Lydia's results reflected a more distinct preference hierarchy compared to Mabel and Colten. Lydia selected the flip phone (HP), paper clips (MP), and door stop (MP) during 45.5%, 33.3%, and 28% of the trials. As with Colten, Lydia selected dental floss (LP) during the fewest number of

trials for which it was available (12.8%). Also consistent with Colten, Lydia approached all stimuli presented during the single stimulus SPA (obviating any determination of LP items). Finally, in the free operant SPA, Lydia manipulated the damaged iPhone 4s (HP) during 26.7% of the intervals, and she manipulated liquid paper (MP) and a stuffed animal (MP) during 20% and 13.3% of the intervals, respectively. Fourteen of the remaining items evaluated via the free operant SPA were associated with manipulation during 10% or less of the intervals and were thus considered LP. Lydia's HP items identified via the MSWO (flip phone) and free operant SPA (iPhone 4s) were consistent with her reported history of stealing (via TSI), as was the identification of her MP items (stuffed animal Chapstick®) via the free operant SPA. Although Lydia had reportedly stolen various food and drink items, she was not specifically known to have stolen black olives making this preference somewhat surprising. It was also somewhat surprising that money (two quarters) ranked in the middle of the resulting preference hierarchy for the MSWO given her reported history of stealing it.

Lydia's FA results are shown in Figure 11 (top). Unlike Mabel and Colten, Lydia did not steal during any of the naturalistic FA trials precluding both a determination of function and predictive validity (i.e., matching) of the Study 1 outcomes for the FAST and TSI. During the analog FA, Lydia stole (olive) during the second trial of the alone condition series and refrained from stealing during the pairwise analysis. Thus, although replication across FA methods was absent, the results of the analog FA suggested that Lydia's stealing was maintained via nonsocial reinforcement matching her TSI outcome (nonsocial reinforcement) but not her FAST outcome (access to social positive reinforcement) from Study 1.

None of the remaining participants (Figure 11, bottom, and Figure 12, stole during either FA model obviating determinations regarding behavioral function or predictive validity, and

Jenson also refrained from stealing during a final extended (naturalistic) alone condition trial. SPA results for these participants were as follows. Bottled water was selected by Jenson on the highest percentage (33.3.%) of MSWO trials for consumables, and this was designed his HP item (Figure 7). Goldfish® crackers (31.3%), bai Bubbles (22.7%), and Ritz Bits (22.7%) were designated MP consumable items for Jenson based on their rankings after bottled water. Jenson never selected black olives and this item was designated as LP. For the MSWO using non-consumable items, glue was designated as a HP for Jenson (selected on 35.7% of trials). A flip phone (31.3%) and a music CD (27.8%) were selected by Jenson on the second and third highest percentage of trials and were designated MP items. Jenson's identified LP, non-consumable item was the earbuds with an MP3 player (16.1%). Overall, the hierarchies resulting from the MSWO assessments were modest and produced some unexpected results. For example, Jenson had reportedly stolen earbuds despite their low ranking. The single stimulus SPA outcomes for Jenson did not reflect preference differences across stimuli. Finally, in the free operant SPA, Jenson selected the earbuds with an MP3 player during the highest percentage of intervals (30%) followed by the flip phone (13.3%) and these items were designated HP and MP, respectively. The remaining items in this SPA were all designated LP due to being selected during less than 10% of the intervals. While the MP3 player was omitted from Jenson's FA due to its relatively high cost, a decision was made to categorize the earbuds as HP given concordance between the free operant SPA results and the fact that he had previously stolen earbuds.

Celia's MSWO assessments both yielded relatively distinct preference hierarchies (Figure 8). For consumables, Celia selected Pringles (HP) on 60% of the trials and she selected Doritos® and Goldfish® on 33.3% of the trials (both MP). Celia never selected black olives (LP). For non-consumables, Celia selected body spray (HP) on 71.4% of the trials and dental floss and

paper clips on 33.3% and 27.8% of the trials, respectively (both MP). A washcloth was identified as Celia's LP non-consumable item (selected on 13.9% of trials). In the single stimulus SPA, Celia did not approach the 9V battery (LP). Lastly, Celia manipulated a rag (HP) during 30% of the free operant SPA intervals. Three items (body spray, liquid paper, and drawing paper) identified as MP were manipulated by Celia during 13.3% of the intervals, and another MP item (pencil) was manipulated during 6.7% of the intervals. Twelve of the available items during the free operant SPA were never manipulated by Celia and designated as LP. Thus, among items reported previously stolen by Celia, a rag ranked at the top of the free operant SPA hierarchy, while body spray ranked at the top of the MSWO SPA hierarchy and next to the top of free operant SPA hierarchy. Paper, as an item previously stolen by Celia, ranked next to the top of the free operant SPA hierarchy. Interestingly, dental floss and paper clips ranked ahead of the purse, pencils/paper, and wash cloth in the MSWO SPA hierarchy even though only the latter had been reported as targets of Celia's thefts. Similarly, liquid paper's higher selection percentage during the free operant SPA compared to items that Celia had reportedly stolen (e.g., pencils/pens, nail polish, dish towel, purse, wash cloth) was unexpected.

Wyatt selected Hershey's Kisses (HP) during 62.5% of the MSWO trials (Figure 9). Goldfish® and black olives were each selected by Wyatt on 33.3% of the trials, and he selected Pringles® on 29.4% of the trials (all considered MP). By contrast, Wyatt chose bottled water (LP) on only 13.4% of the trials. For non-consumable items, Wyatt selected the Walkman® radio and the hat each at 62.5% of the intervals (both serving as HP items). The second and third most selected non-consumable items for Wyatt were the t-shirt (31.3%) and the paper clips (23.8%), and these were considered MP. Wyatt's lowest ranked item in the MSWO assessment for non-consumables was dental floss (12.8%). As with Colten, Lydia, and Jenson, Wyatt approached all

items during the single stimulus SPA. Finally, during the free operant SPA, Wyatt exclusively manipulated the Walkman® radio (100%). Wyatt's apparent strong preference for the Walkman® radio aligns with his reported history of stealing radios. Other items reportedly stolen by Wyatt also ranked near the top of the MWSO preference hierarchy including hat and t-shirt, while socks ended up next to last in the same hierarchy. A summary of items embedded as stealing targets in each participant's FAs is shown in Table 12.

Study 2 involved an evaluation of two different FA models for determining the function of stealing and relating the obtained results back to the TSI and FAST outcomes from Study 1. Table 13 shows a summary of the obtained outcomes for these relations by FA model. Three of the 6 participants (a 50% "hit rate") stole during one of the FA models permitting a determination of behavioral function. For each of the three FA hits, the results matched the outcomes of the TSI in suggesting a nonsocial stealing function yielding a predictive utility of 100% for this tool. By contrast, none of the FA outcomes for the three hits matched their corresponding FAST outcomes (as this tool suggested social reinforcement functions in each case). So, the predictive utility of the FAST outcomes for this sample was 0%. However, it is noted that FAST item 9, which was found to be reliable across 100% of cases, correctly predicted a nonsocial function for all three hits. Future research might examine the viability of using this single question to predict nonsocial stealing functions. Interestingly, for each FA hit, there was no replication of the outcome across FA models. That is, both Mabel and Colten stole during the alone condition of the naturalistic FA and failed to steal at all during the analog FA. Also, Lydia stole during the alone condition of the analog FA but failed to steal during her naturalistic FA. A possible implication of this finding is that practitioners may try switching models if the first one fails to evoke stealing.

The low hit rate for the two FA models was consistent with results reported by Switzer et al. (1977) and deserves further consideration. This is especially so with Jenson who failed to steal even when multiple steps were taken (e.g., extending the trial duration to 30 min, eliminating pre-trial contact between Jenson and the therapist, embedding 12 HP/MP items) to maximize the likelihood of responding. It is possible that the non-responders, as a group, had acquired a higher degree of stimulus control over their stealing such that certain aspects of the experimental preparation were discriminative for punishment, thereby inhibiting stealing (extrapolating from Doughty, Anderson, Doughty, Williams, & Saunders, 2007). Adroitness with respect to stealing may be related to accumulated experience and Jenson and Celia were ostensibly the most prolific thieves in this sample. In Jenson's case, his previous arrests may have facilitated strong stimulus control over his stealing. It is also possible that, for some participants, the inclusion of items evaluated via SPAs during FA trials may have generated rule formation that inhibited responding. For example, one rule might have been, "I should not steal X because it clearly belongs to the new therapist, and he might figure out that it is missing." In Jenson's case, the items embedded during the extended alone trial were the same as or generally similar to the items embedded in his initial FAs such that he may have discriminated their ownership, although the passage of time between the initial FAs and the final trial was substantial. Still, aspects of the instructions provided to Jenson during the extended alone trial, along with the sudden, unusual appearance of 12 preferred items, may have been sufficient to inhibit his responding. Future investigators might evaluate the effects of more subtle environmental changes within the context of an extended alone trial for non-responders. For example, given that items previously stolen by the current participants were generally found to be preferred via SPAs, perhaps the SPA process could be omitted. It is noted, though, that

inclusion of items evaluated via SPAs during subsequent FAs served to establish ownership of the items. If SPAs were omitted, future investigators would need to establish item ownership via other means (e.g., labeling them) to mitigate ambiguity. Said differently, uncertainty may arise as to whether consuming a preferred snack that suddenly appears in one's own home constitutes stealing. Another factor that may have inhibited stealing during the FAs is insufficient trial duration, which might have involved a failure to activate the relevant EO and/or to establish effective timeframes within which an individual's stealing might typically occur (Simmons et al., 2019). Such time frames might sometimes be much longer than either the 5-min trials or the extended (30-min) trial experienced by Jenson. Although efficiency was a primary concern in constructing the current FA models, future investigators might conduct a parametric analysis of different trial durations or evaluate Kahng et al.'s (2001) model for assessing low rate behavior. However, a potential problem with Kahng's model as applied to stealing concerns attribution within congregate settings when items are embedded over extended periods. For Wyatt, it is possible that failure to capture his stealing was related to omission of relevant contextual factors. Specifically, although Wyatt reportedly stole items from his housemate's bedroom, this location was not evaluated via his FA due to logistical and ethical concerns. Anecdotally, stealing from a housemate's bedroom was reported for quite a few Study 1 participants. Although management personnel and staff persons were asked to withhold consequences for any stealing occurrences outside of the study, it was not possible to accurately monitor this. So, it is unknown whether any participant failed to steal because of a recent history of punishment. Lastly, two issues pertaining to SPA methodology may have contributed to nonresponding during FAs. First, none of the cell phones were operational when presented via SPAs. Although it was likely unclear to participants whether the phones were unusable or usable

if charged, the phones may have been devalued, nonetheless. For example, Colten commented that the iPhone 4s with a cracked screen was "broken". Although functioning cell phones were omitted here due to ethical concerns regarding embedding high cost items, perhaps the inclusion criteria (value of less than $10.00) were overly conservative. Also, if selected during a SPA, money was retrieved from participants following trials (and this was specified prior to trials). This was done partly for consistency because participants were not permitted to keep any other non-consumable items. Still, SPA outcomes and FA outcomes may have differed if participants had been permitted to keep the money selected.

The current study extends Lambert et al. (2019) and Simmons et al. (2019) in several ways. First, this is the first known example of FAs targeting non-food stealing and the first study to examine alternative FA models for such behavior. Second, this is only the third known study including FAs of food stealing and the second known study (after Simmons et al.) involving an FA of *covert* food stealing. In the current sample, nonsocial functions were identified across food (Lydia) and non-food items (Mabel and Colten). However, it remains to be seen whether differences in function exist across target categories in larger samples and other populations. Third, in contrast to Simmons et al., a therapist was present during the attention condition trials of the current FAs to serve as a clear S^D for the availability of attention as reinforcement. Simmons et al. reported that food stealing occurred during the initial trials of some test conditions for social reinforcement before abating, which may have occurred because the participant's mother left the room at the session outset and only reentered contingent upon stealing. It is possible, then, that the child's stealing during some initial social reinforcement test trials was inadvertently punished via contingent vocal feedback and came under inhibitory stimulus control during subsequent test trials. The presence of a therapist in the attention

condition trials of the current study may have ensured that any inhibitory stimulus control associated with general supervision was present from the outset of those trials. The absence of stealing during all trials for which a therapist was present (including both test and control conditions) supports the importance of general supervision. Fourth, as noted by Simmons et al., their latency-based measurement of stealing would only be appropriate for non-covert stealing or situations where therapists have access to an FA room with one-way observation capacity. Consistent with some previous researchers (e.g., Maglieri et al., 2000; Switzer et al., 1977), a practical approach to measuring permanent products of stealing was employed here. A prerequisite for effectively using permanent product measures, though, is the ability to ensure accurate attribution (see Switzer et al., 1977). For this study, attributional errors were controlled in two ways. First, participants encountered embedded stealing targets in situations where competing thieves (e.g., housemates) were not immediately present. Second, item inventory lists were checked as part of the post-FA measurement process to ensure that all embedded items were accounted for. Thus, if an item were not immediately located in its previously embedded position post-trial, a more thorough check of the area was completed to determine if (perhaps) the participant had simply moved an item rather than having stolen it. In Lydia's case, her food stealing was directly observed from a one-way observation booth obviating attributional errors. But, even in her case, a permanent product measure was employed for sake of consistency and because latency measures would not be usable for any post-study treatment evaluation that targeted natural situations (i.e., outside of the FA room). The current study also departs from Lambert et al. and Simmons et al. in its inclusion of a formal link between construction of the FA conditions and pre-FA information (lending a degree of ecological validity to the former). That is, although all participants experienced the pairwise analysis of attention condition trials vs.

control condition trials (based on the near-uniformity with which the FAST suggested a social positive reinforcement function and the need to have a comparison with the alone condition trials), additional conditions were only included in the FA based on Study 1 outcomes. For example, the inclusion of a phase to evaluate a possible social negative reinforcement function for Colten was guided by his FAST outcomes. The TSI results were also used here to identify previously stolen items for inclusion in SPAs (or directly in FAs) and relevant locations for the naturalistic FA (e.g., home). By contrast, less formal processes (unstructured parental reporting) were followed in Lambert et al. and Simmons et al. with respect to structuring their respective FAs. Although unstructured and open-ended interviews with caregivers have received much recent attention in the FA literature (Hanley, 2012; Hanley et al., 2014; Jessel, Hanley, & Ghaemmaghami, 2016), the relative merits of such approaches to structuring FAs compared to a structured tool like the TSI is unknown.

In terms of the comparison of FA models, it is interesting to note that the number of items embedded per trial was biased towards the analog model with no clear resulting advantage (stealing was evoked in only one case). Further, the inclusion of even more stealing targets (12 HP/MP items) in Jenson's final extended alone trial failed to evoke stealing. As such, practitioners may consider the relative advantages of the naturalistic method employed here. For example, with fewer items to embed, the naturalistic model entails easier set up and a more efficient inventory check. Overall, including both trial and between-trial periods, naturalistic FAs were completed in less time (about 60 min or less) than analog FAs (about 70-80 min). Naturalistic FAs may also capitalize on relevant contextual stimuli (see Henderson, 1981).

Some limitations of Study 2 deserved explication. One potential limitation concerns the use of abbreviated phases within the research design. Specifically, phases were discontinued

upon occurrences of stealing limiting within-phase replications and the analysis of post-reinforcement effects (e.g., whether stealing would maintain in a condition after ostensibly contacting reinforcement). This abbreviated design was intended to permit efficient analyses across multiple participants and is in keeping with the preliminary nature of the investigation and the strong likelihood of nonsocial stealing functions. Though probably unnecessary in practice, the inclusion of a pairwise analysis of alone condition trials vs. control conditions trials would have strengthened the design and minimized alternative explanations (i.e., threats to internal validity). As noted by Iwata et al. (1994b), individuals with intellectual disabilities might sometimes fail to discriminate contingencies associated with multiple, rapidly alternating conditions, and a similar problem could arise when few trials are completed due to insufficient contingency exposure. Interaction effects, in which responding in one condition is impacted by responding during other conditions, can also hinder the analysis of data produced via multielement designs. Iwata et al. (1994b) introduced the pairwise design as an attempt to mitigate contingency discrimination problems and to minimize interaction effects by limiting the number of test conditions evaluated within each sequential phase to one, while also maintaining efficiencies not evident with reversal designs. In the current study, use of the pairwise design was intended to mitigate (a priori) potential contingency discrimination problems and interaction effects that might have occurred with a multielement design. Also, rather than control for sequential confounding via random sequencing of test and control trials (Barlow & Hersen, 1984), test trials always preceded control trials here due to concerns that AO effects (via provision of continuous attention, etc.) in the latter might inhibit responding in the former (Berg et al., 2000; McComas et al., 2003). This strategy of capitalizing on MOs to facilitate differential responding across test and control FA conditions was suggested by Iwata et al.

(1994b) and later received empirical support in Hammond et al.'s (2013) examination of fixed vs. random FA condition sequences using a multielement design.

Another possible limitation of the current study concerns the nature of the SPA process. While admittedly elaborate, the combined SPA durations per participant were not overly long (with each being completed within about 75 min on a single day). Nevertheless, a more efficient process for determining item inclusion during stealing FAs would be desirable. Based on the generally undifferentiated outcomes (a problem noted by Tiger & Kliebert, 2011), it appears that the single stimulus assessment could have been omitted. Also, the MSWO assessment for non-consumables yielded weak or non-distinct preference hierarchies for 4 out of 6 participants. On the other hand, items identified as LP (controls) via MSWO outcomes for non-consumables were never stolen during the FAs, and Colten stole the second-ranked item from his non-consumable MSWO SPA. The free operant SPA generally resulted in distinct preference hierarchies, effectively identified LP items that were never stolen during FAs, and effectively identified HP items that *were* stolen in FAs for Colten and Mabel (diapers were omitted from the latter's MSWO SPA). Thus, although Lydia did not steal the HP item identified via her free operant SPA and Wyatt exclusively manipulated one item during his free operant SPA, the free operant method offered some advantages relative to the MSWO for purposes of identifying preferred non-consumables. Compared to the MSWO for non-consumables, the MSWO for consumables produced distinct hierarchies for 4 out 6 participants. Also, Lydia was the only participant to steal a food item, which was identified for inclusion in her FA based on its top ranking from her MSWO results. Although the data presented here provide some support for using the MSWO (consumables) and free operant (non-consumables) SPAs for purposes of determining specific items to embed during FAs of stealing, items identified as HP were also identified via the TSI as

previous stealing targets (or, in Lydia's case, were consistent with general categories of items stolen). Thus, although SPAs are important for other reasons (e.g., identifying potential reinforcers to strengthen an alternative response), their role with respect to determining specific items to use in an FA of stealing might reasonably be limited to determining LP or control items (which is mostly a research concern) or for pinpointing preferred items from a general category (as when a caregiver reports that an individual has stolen many kinds of food).

One interesting extension of the current research might involve examining whether persons diagnosed with kleptomania tend to steal during FAs without regard to the established preference rankings of the items taken. If a person so diagnosed only stole HP items during an FA (as opposed to indiscriminate stealing), then perhaps the accuracy of the diagnosis would be questioned. Based on the diagnostic features of kleptomania, it might also be interesting to determine whether persons so diagnosed would respond in an undifferentiated manner when presented with items during a SPA.

Because one premise behind the development of the TSI was that existing indirect assessment tools (e.g., FAST, QABF, etc.) sampled task-related escape functions that were likely irrelevant for stealing, it was perhaps an oversight that not all participants were exposed to such a contingency for purposes of evaluating the premise, and future investigators may wish to do so. However, the decision to omit this analysis seems justified given that (a) only 3 out of 42 (7%) participants had FAST outcomes suggesting maintenance of stealing via social negative reinforcement and (b) one of these participants (Colten) failed to steal when exposed to such a contingency. Perhaps the likelihood of evoking Colten's stealing would have been enhanced given the inclusion of a pre-FA demand assessment (e.g., Call et al., 2016; Call, Pabico, & Lomas, 2009; Roscoe, Rooker, Pence, Longworth, & Zarcone, 2009; Zangrillo, Simmons,

Fisher, & Owen, 2020). However, excluding social reinforcement test conditions from FAs when pre-FA information does not support their likely relevance is consistent with best practice guidance (Beavers et al., 2013; Iwata & Dozier, 2008).

Some researchers have examined combined social reinforcement contingencies within the same FA condition (e.g., Curtis et al., 2020; Hanley et al., 2014; Jessel et al., 2016) under the assumption of multiple control (i.e., interaction of functions). While it is possible that some individuals may exhibit stealing maintained by multiple sources of reinforcement, the models tested here were designed to isolate single functions and this seems justified given that multiple control was either never (TSI) or rarely (FAST) implicated in Study 1. Nevertheless, future investigators might examine single vs. combined contingencies in an FA of stealing if justified given pre-FA information. We embedded LP items in the social reinforcement test conditions on the premise that the value of embedded items should be discounted when social reinforcement is paramount over access to the item gained. However, it is possible (though unlikely) that some individuals may steal HP items only when doing so produces a certain kind of attention. To demonstrate the importance of such an interaction would require showing that the individual (a) does not steal LP items when stealing produces the same kind of attention and (b) does not steal HP items when attention is clearly unavailable (i.e., alone).

Although some might find a distinction between the kinds of stealing reported in the extant literature on juvenile delinquency (e.g., Patterson, 1982; Reid & Patterson, 1976), or those cases contributing to official crime statistics, and the kinds of stealing represented here, discounting the social significance of the latter seems unwarranted for several reasons. First, five individuals in Study 1, including Jenson in Study 2, had previously been arrested for stealing. Second, on at least one occasion, twelve subjects reportedly stole items worth more than $100

and several subjects had stolen items likely worth upwards of $500. According to the FBI-URC statistics for 2018, thefts of up to $200 comprised about 2.3 million (over 50%) of the offenses reported. Whether due to the value of the items stolen, the frequency with which some subjects reportedly stole (daily or weekly in 30 cases), or the kinds of items reportedly stolen (including cell phones, radios, cash, clothing, etc.), the stealing represented here is consistent with the kinds of theft that lead to legal system encounters. In fact, it is perhaps only because of the close supervision afforded the current subjects that more arrests were not reported.

A final limitation concerns the somewhat subjective distinction between the labels naturalistic and analog. The model employed here in which FA trials were completed in participants' home settings (or usual therapy room for Colten) contained many contextual features likely associated with previous stealing incidents, but this experimental preparation was not completely natural. For example, the presence of a relatively novel therapist, the ruse involving meeting with staff persons, the instructions given (e.g., to remain in a particular area where items were embedded), and other procedural aspects limited the degree of naturalism. That said, the contextual differences between the naturalistic model and the analog model (in terms of the ruses used and locations employed) were notable despite the absence of differential outcomes.

CHAPTER 6

SUMMARY, CONCLUSION, RECOMMENDATION

Despite the large economic and social impacts of theft, published attempts to evaluate behavior analytic assessment models and treatment approaches have been rare. In part, the paucity of behavior analytic research on stealing may be related to stakeholders' discounting of this problem relative to behaviors that may cause physical harm like self-injurious behavior and physical aggression (Reid & Patterson, 1976; Williams, 1985). For example, less than half of participants from Study 1 were reported to have a treatment plan targeting stealing. It could be that the importance of stealing is only recognized once it directly impacts caregivers or other persons capable of effectively registering complaints. The current two-part study attempted to address some of the other variables that have hindered this research. For example, covertness and low rate are often cited as hindering factors for stealing research (e.g., Azrin & Wesolowski, 1974; Henderson, 1981; Jeffery, 1969; Reid & Patterson, 1976; Pawsey, 1996; Seymour & Epston, 1989; Simmons et al., 2019), and these variables appear to have been well-represented in the current sample. Specifically, over 70% of Study 1 participants were reported to have stolen weekly or less often. Also, for 85% of cases, at least one interviewee indicated that the participant usually stole while alone or unaccompanied (item #13 on TSI) consistent with covertness. Covertness and low rate are factors that may render descriptive analyses, unless deliberately structured (e.g., Anderson & Long, 2002), ineffective in terms of efficiently capturing stealing and correlated environmental variables. To address this likely gap in the assessment tool arsenal, the viability of two different indirect assessment tools was examined here yielding results supporting the reliability and initial predictive validity of the TSI. Research on treatment development for stealing has also likely been forestalled because of the absence of

published examples of FA models fitted to the characteristics of the response (which might generate function-based interventions). The current investigation contributes to nascent efforts in this area by demonstrating two potential FA models, both of which involved manipulations designed to efficiently evoke low rate stealing (embedding systematically identified items during FA trials) and to yield reliable measurement thereof (via post-trial permanent products). Additional research is needed, though, to determine effective approaches for capturing stealing when individuals refrain from doing so within initial FA trials.

In addition to further refinement of FA processes for stealing, including extension to other populations, the limited research on effective intervention stems predominately from investigations completed several decades ago and reviewed elsewhere (Miller & Klungness, 1986; Miller & Klungness, 1989; Miller & Moncher, 1988; Miller & Prinz, 1991; Williams, 1985). Thus, perhaps an updated consideration of interventions from a behavior analytic perspective is in order. Determining effective interventions, likely requiring close supervision as a preventive component (Glueck & Glueck, 1950; Krohn & Thornberry, 2003; Page et al., 1983b; Patterson, 1982; Pawsey, 1996; Reid & Patterson, 1976; Riley & Shaw, 1985; Robins, 1966; Seymour & Epston, 1989), may be aided by considering a preliminary functional treatment taxonomy (e.g., Berg et al., 2016; Geiger, Carr, & Leblanc, 2010) delineating interventions with at least some empirical support, along with others that may warrant investigation. As depicted in Table 14, such a taxonomy might reasonably emphasize default interventions and other interventions seemingly suited for addressing stealing maintained by nonsocial reinforcement. Although most default interventions with some empirical support for addressing stealing, including overcorrection (Azrin & Armstrong, 1973; Azrin & Wesolowski, 1974), response cost (Brooks & Snow, 1972; Kraft, 1970; Reid & Patterson, 1976; Rosen & Rosen, 1983), stimulus

control (Rosen & Rosen, 1983; Simmons et al., 2019), and DRO (Page et al., 1983a/1983b; Rosen & Rosen, 1983; Switzer et al., 1977; Vogl & Rapp, 2011), have involved punishment, other potentially effective interventions (perhaps not evaluated specifically for stealing) might be extrapolated from the general behavioral intervention literature. For example, given that the provision of preferred leisure items may sometimes compete with automatically-reinforced problem behavior (e.g., Berg et al., 2016; Gover, et al., 2019; Groskreutz et al., 2011; Richman, Barnard□Brak, Grubb, Bosch, & Abby, 2015; Ringdahl, et al., 1997), perhaps persons that steal could be taught to retrieve and manipulate their own preferred items during periods of lessened supervision. As suggested by Lambert et al. (2019), another treatment approach that has intuitive appeal in relation to stealing involves efforts to bolster self-control. Impulsivity is said to occur when individuals select smaller, relatively immediate reinforcers at the expense of delayed, larger rewards (Ainslie, 1974; Critchfield & Kollins, 2001; Dixon et al., 1998; Jackson & Hackenberg, 1996; Logue, 1995; Rachlin & Green, 1972; Schweitzer & Sulzer-Azaroff, 1988; Vollmer et al., 1999), and some have characterized persons that steal or engage in other antisocial behaviors as being impulsive (e.g., Farrington, 2005; Gottfredson & Hirschi, 1990; Loeber et al., 1998; Moffitt, 1993; Patterson, 1982; Stumphauzer, 1970). For example, Mischel (1961) showed that delinquents, compared to nondelinquents, were more likely to choose smaller immediately available rewards over larger delayed rewards. Bandura and Mischel (1965) showed that children's responding towards immediately available or delayed rewards could be altered in the opposite direction (i.e., self-control) by introducing a model that chose immediate or delayed rewards. Stumphauzer (1970, 1973) demonstrated that contingent social approval and live models could be employed to alter the impulsive monetary choices of incarcerated individuals. Although none of these examples entailed demonstrating changes in stealing or

other antisocial behaviors, procedures designed to improve self-control warrant examination in this regard. In some cases, reinforcement of an alternative response (Vollmer & Iwata, 1992), perhaps as an adjunct to options already discussed, might be useful. For example, individuals that steal items left lying around (perhaps seemingly misplaced) might be taught to return such items to their owner or submit them to a responsible adult using contingent reinforcement. Such an approach allows for demonstrating that a potential stealing target was noticed, but it might be undesirable when owners of the stealing targets would be displeased by having their belongings displaced. Another novel approach compatible with self-management strategies would involve reinforcing correspondences (matches) between an individual's stated intention to refrain from stealing in a specific setting and her subsequent confirmed omission of stealing (e.g., Bevill-Davis, Clees, & Gast, 2004; Burron & Bucher, 1978; Hartig & Kanfer, 1973; Lloyd, 2002; Monahan & O'Leary, 1971; O'Leary, 1968). Self-management strategies may be particularly useful given the apparent frequency with which stealing occurs under conditions of lessened supervision. Lastly, because stealing may frequently be determined after-the-fact, future research might examine the role of delayed consequences based on products of the response (Grace, Thompson, & Fisher, 1996; Meindl & Casey, 2012).

Function-based treatments for problem behavior maintained via social positive reinforcement have been reviewed by multiple authors (e.g., Greer & Fisher, 2017; Grow, Carr, & LeBlanc, 2009; Rodriguez, Fisher, & Kelley, 2012) and may serve as a starting point when considering interventions for stealing thusly maintained. Empirical demonstrations of such interventions for stealing have been rare, though, which is perhaps not surprising given that stealing largely occurs covertly and without socially-mediated reinforcement. Therefore, the discussion here will mostly entail extrapolating potential interventions from the extant literature

on treatment of other socially-maintained problem behaviors. Perhaps the most viable options here would involve using access to social positive reinforcers (e.g., attention) to differentially reinforce appropriate behaviors (DRA) (Vollmer & Iwata, 1992; Vollmer, Peters, Kronfli, Lloveras, & Ibañez, 2020) or the omission of stealing (DRO). However, DRO may not be appropriate for situations involving discontinuous observation where the absence of stealing cannot be verified (Venning et al., 2003). The aforementioned interventions (token economy, self-control training, correspondence training, etc.) considered relevant for addressing non-socially reinforced stealing are amenable to including social positive reinforcers. Two interventions often used to decrease problem behavior maintained via social positive reinforcement are perhaps not ideal interventions for stealing. With nocontingent reinforcement, a mismatch is evident between the richness of the schedules typically employed (see Carr et al., 2000; Lalli, Casey, & Kates, 1997; Vollmer, Iwata, Zarcone, Smith, & Mazaleski, 1993b) and the extended time frames within which stealing seems to occur. However, to the extent that nonfunctional reinforcers may sometimes compete with socially-maintained problem behavior (Fisher, O'Connor, Kurtz, DeLeon, & Gotjen, 2000; Hanley, Piazza, & Fisher, 1997; McCord & Neef, 2005; Richman et al., 2015; Ringdahl, Winborn, Andelman, & Kitsukawa, 2002; Roscoe, Carreau, MacDonald, & Pence, 2008), perhaps preferred leisure items could be made available in a preventive manner during anticipated periods of reduced supervision. Alternatively, a rich schedule of access to the maintaining class of social reinforcers could be arranged immediately prior to periods of reduced supervision to attain AO effects (Berg et al., 2000; Hammond et al., 2013; McComas et al., 2003). In two studies already mentioned, access to attention (as the presumed maintaining variable) was differentially provided contingent upon the absence of stealing (Wetzel, 1966) or mitigated upon its occurrence (Luiselli & Pine, 1999). More

specifically, in the latter article, customary forms of post-stealing counseling and admonishments were withheld as a consequence for stealing. However, as previously noted, lack of experimental control hampers conclusions about the outcomes in Luiselli and Pine (1999), and punishment may have accounted for the effects in Wetzel (1966), rather than the delayed withholding of attention in relation to stealing. In fact, extinction, which requires a rather immediate withholding of effective consequences, may have limited utility with regard to decreasing stealing that produces delayed and intermittent social positive reinforcement (i.e., stealing acts are often discovered after the fact).

Some instances of stealing may be reinforced via idiosyncratic social stimuli such that reinforcement contingencies for alternative behaviors may need to be tailored accordingly (extrapolating from Brooks & Snow, 1972; Buckle & Farrington, 1984; Leung et al. 1992; Miller & Klungness, 1986; Miller & Klungness, 1989; Moore, 1984; Renshaw, 1977). For example, stealing that produces delayed opportunities to gift or exchange stolen items for other things may necessitate an intervention in which prosocial behaviors generate similar opportunities such as the reward exchanges used in token economies (Hackenberg, 2018; Kazdin, 1982; Kazdin & Bootzin, 1972; Liberman et al., 1975; Phillips, 1968; Phillips, Phillips, Fixsen, & Wolf, 1971). Also, successful intervention may hinge upon the involvement of valued peers when contingent peer attention competes with contingent caregiver or other adult attention (Broussard & Northup, 1997; Patterson, Capaldi, & Bank, 1991; Catalano & Hawkins, 1996; Cox, Cox, Anderson, & Moschis, 1993; Huizinga et al., 2003; Johnson, 1979; Keenan, Loeber, Zhang, Stouthamer-Loeber, & van Kammen, 1995; Lipsey & Derzon, 1999; Miller & Prinz, 1991; Patterson, 1982; Sampson & Laub, 1993). If money is the primary theft target, perhaps a comprehensive intervention would include job training and employment assistance (if indicated) or, for younger

persons, opportunities might be provided to earn tokens exchangeable for the same kinds of items bought with stolen money.

Geiger et al. (2010) explicated an excellent comprehensive treatment taxonomy for problem behavior maintained via social negative reinforcement. Unfortunately, the viability of interventions covered in Geiger et al. is suspect in regard to stealing due largely to the fact that they would require the unlikely cooperation of natural contingency managers (e.g., peers). For example, peers may not terminate their coercive demands for an individual to steal contingent upon the individual's failure to steal (differential negative reinforcement of other behavior) or immediately issue additional demands when stealing occurs (as in escape extinction). Although empirical demonstrations await, logical function-based treatment implications can be derived when stealing is maintained via social negative reinforcement. For example, persons that steal under non-violent coercion (aversive peer pressure) or in response to mistreatment might be taught assertiveness skills to terminate or redirect such interactions and self-advocacy (Bates, 1980; Bornstein et al., 1977; Sievert et al., 1988; Test et al., 2005). Extrapolating from Lambert, Bloom, Samaha, Dayton, and Rodewald (2015), Bloom and Lambert (2015) discussed how establishing multiple self-advocacy responses may offer some inoculate against extinction effects. Thus, future investigators might examine the relative benefits of teaching multiple responses for effectively terminating coercive inducements to steal and reporting such occurrences.

Finally, given the previously discussed potential for idiosyncratic social reinforcement contingencies, it may be the case that FA conditions will require some alterations. For example, if stealing is suspected to be maintained via contingent escape from aversive demands or social inducements, a condition could be devised in which such social persuasions are terminated

contingent upon stealing. In such a condition, a therapist or perhaps confederate peer might begin the trial by modeling stealing of a clearly marked LP item (in order to isolate the escape contingency as paramount). Unless and until stealing occurred, the therapist might deliver continuous, non-aggressive social persuasion (cajoling, etc.) for the participant to steal such as saying, "Wouldn't you like to have that ball?" or "You should just take it". Although perhaps it is unlikely that an individual might be sensitive to attention as delayed reinforcement for stealing but not sensitive to a similar immediate contingency, arranging for a delayed access to attention condition might have ecological validity because stealing consequences may often be delayed (Bishop, 1973; Jeffery, 1977; Miller & Klungness, 1989; Stumphauzer, 1976; Wetzel, 1966). Such an FA condition might employ rule statements (e.g., "If any items are missing when I return, we'll have to have a long talk") used to signal the availability of delayed attention (e.g., admonishments and counseling) contingent upon stealing. Similar modifications might permit contingent post-trial opportunities to gift, exchange, or boast about, stolen items.

EXHIBITS

Table 1.

Summary of Behavioral Research Articles on Interventions for Stealing

Year	Authors	Setting	Participants and measurement	Functional assessment (hypothesis)	Treatment	Design	Generalization
1966	Wetzel	Facility	*N= 1; Age*= 10 *IDD*= Yes *Items stolen*= Toys, books, pin, clothes, toiletries, pencils, money, matches, artificial tree *Measurement*= Permanent product	Indirect (access to attention)	Didactic component DRA, Daily DRO	AB with naturally occurring reversals	None
1970	Barton, et al.	Hospital	*N*= 16; *Age*= 9-23 *IDD*= Yes *Items stolen*= Food *Measurement*= % of observation periods in which stealing occurred	None	Time-out with response cost (loss of meal)	Multiple baseline	None
1973	Azrin & Armstrong	Hospital /facility	*N*= 22; *Mean age*= 38 *IDD*= Yes *Items stolen*= Food *Measurement*= Time sampling (% correct responses during meals)	Indirect (access to attention)	Positive practice over-correction	Multi-element	Reported every 4 weeks for 28 weeks post training.

Year	Authors	Setting	Participants and measurement	Functional assessment (hypothesis)	Treatment	Design	Generalization
1974	Azrin & Wesolowski	Hospital	*N*= 34; *Mean Age*= 41 *IDD*= Yes *Items stolen*= Food; other unspecified items *Measurement*= Frequency	None	Over-correction with reprimand	ABA	None
1977	Switzer et al.	School	*N*= 26 students (three 2nd grade classes) *IDD*= None specified *Items stolen*= Money, pens, pencils, toys *Measurement*= Permanent product	None	Lecture; group contingency (access to periods of free time)	Multiple baseline	None
1982	Mason et al.	Hospital	*N*= 5; *Age*= 9-10 *IDD*= Yes *Items stolen*= Not specified *Measurement*= Permanent product	None	Over-correction; DRO	Study 1= Reversal/ multiple baseline; Study 2= Multiple baseline	Follow-up at 1 to 4 months
1983a	Page et al.	Hospital	*N*= 2; *Ages*= 8, 11 *IDD*= Yes (Prader-Willi syndrome) *Items stolen*= Food (candy, peanuts, chips, soda) *Measurement*= Frequency (rate per min)	None	DRO	Multiple baseline	Four evaluations over 6-9 weeks with DRO; maintained 0 rates

Year	Authors	Setting	Participants and measurement	Functional assessment (hypothesis)	Treatment	Design	Generalization
1983b	Page et al.	Hospital	*N*= 1; *Age*= 28 *IDD*= Yes (Prader-Willi syndrome) *Items stolen*= Food (chips, crackers, cheese curls, soda, cookies) *Measurement*= Frequency (rate per min)	None	DRO; differential reinforce-ment for weight loss; response cost	Multiple baseline	Weights taken from 2 months to 22 months post-discharge in different settings. Data reflect continued weight loss
1983	Rosen & Rosen	School	*N*= 1; *Age*= 7 *IDD*= Borderline *Items stolen*= Not specified *Measurement*= Permanent product	None	Enhanced monitoring; DRO; stimulus control;	Reversal	Follow-up was completed for 31 days post-treatment
1983	Smith, Piersel, Filbeck, & Gross	Hospital	*N*= 1; *Age*= 23 *IDD*= Yes *Items stolen*= Not specified *Measurement*= Frequency	None	DRO; verbal reprimand; response cost; enhanced supervision	Multiple baseline[6]	None
1988	Van Houten & Rolider	Facility	*N*= 1; *Age*= 17 *IDD*= Yes *Items stolen*= Cookies, soda, audio cassette tapes, necklaces *Measurement*= Permanent product	None	Recreate the scene; verbal reprimand, movement-suppression time-out	AB design (part of a multiple-baseline)	None

Year	Authors	Setting	Participants and measurement	Functional assessment (hypothesis)	Treatment	Design	Generalization
1996	Pawsey	Out-patient	*N*= 14; *Age*= 7-15 *IDD*= None specified *Items stolen*: Not specified *Measurement*= Frequency (including "suspected" stealing)	None	Monitoring; contracting; restitution; punishment	ABC, ABCD	Follow-up interviews completed at least 3 months following treatment
1999	Luiselli & Pine	School	*N*= 1; *Age*= 10 *IDD*= No *Items stolen*= Food (candy, cookies) and supplies (pencil, pad of paper) *Measurement*= Frequency	Indirect only (access to attention)	Token system; extinction; simple correction	AB	Follow-up at 8 weeks
2000	Maglieri et al.	Hospital	*N*= 1; *Age*= 14 *IDD*= Yes (Prader-Willi syndrome) *Items stolen*= Food (cookies, pretzels, etc.) *Measurement*= Grams of food consumed based on pre- and post-session weights	None	Verbal reprimand; stimulus control	AB	Demonstrated across a different context (refrigerator)
2010	Mace et al.	School	*N*= 1; *Age*= 7 *IDD*= Yes *Items stolen*= Food *Measurement*= Frequency	Indirect (access to food)	DRA; response blocking; extinction	ABCAC (reversal)	None

Year	Authors	Setting	Participants and measurement	Functional assessment (hypothesis)	Treatment	Design	Generalization
2019	Lambert et al.	Clinic	*N*= 1; *Age*= 7 *IDD*= Yes (Prader-Willi syndrome) *Items stolen*= Food *Measurement*= Latency	Direct, latency-based FA (access to food)	Response blocking, DRO, DRA (token board exchanges) with schedule thinning	ABAB (with-drawal) and changing criterion	Evaluated in home setting with mother as therapist and different foods
2019	Simmons et al.	Out-patient	*N*= 1; *Age*= 6 *IDD*= No *Items stolen*= Food *Measurement*= Frequency (rate per min)	Latency-based FA (using pairwise and multi-element designs)	Rule statements, stimulus control, DRO, vocal feedback	ABAB (with-drawal)	Across two novel treatment rooms

Note: IDD= Intellectual and developmental disabilities

Table 2

Subject Characteristics for Study 1 (N= 42)

Mean age (range)	Living situation	Psychiatric diagnosis	Stealing frequency	Max value of items stolen 1X	Stealing locations	Previously arrested	*Concomitant behaviors
47.3 (14-76)	Community-based (*N*= 26) Facility-based (*N*= 15) Outpatient (*N*= 1)	37	Daily= 10 Weekly= 20 Biweekly= 4 Monthly= 2 < Monthly= 6	Up to $10= 13 Up to $50= 15 Up to $100= 2 > $100= 12	Home= 41 Stores= 22 Work= 14 Restaurants= 10 Day program= 7 Other= 10	5	Lying= 41 Verbal aggression= 37 Noncompliance= 36 Physical aggression= 31 Property disturbance= 24 Elopement= 20 SIB= 5

**Note:* Other less frequently reported behaviors included digging in garbage, manipulating others, inappropriate sexual behavior, yelling, invading personal space, panhandling, and begging.

Table 3

Percentage agreement scores and Cohen's κ outcomes for respondent pairs (TSI)

Respondent pairs	Agreement	K (95% CI)	*P*-value	Sig.
1	77.7	0.55 (0.18-0.88)	0.20	*ns*
2	66.7	0.32 (-0.15-0.74)	0.205	*ns*
3	70.6	0.40 (-0.01-0.76)	0.079	*ns*
4	61.6	0.20 (-0.11-0.48)	0.289	*ns*
5	94.4	0.89 (0.67-1.00)	0.00	< .001
6	83.3	0.64 (0.15-1.00)	0.006	< .01
7	72.2	0.43 (0.00-0.78)	0.066	*ns*
8	83.3	1.00 (NA)	0.00	< .001
9	88.9	1.00 (NA	0.00	< .001
10	100.0	1.00 (NA)	0.00	< .001
11	100.0	0.77 (0.47-1.00)	0.001	< .01
12	100	0.89 (0.67-1.00)	0.00	< .001
13	88.2	0.73 (0.34-1.00)	0.001	< .01
14	100.0	0.61 (0.16-1.00)	0.009	< .01
15	93.8	0.87 (0.60-1.00)	0.00	< .001
16	75.0	0.44 (-.081-0.87)	0.085	*ns*
17	83.3	0.64 (0.27-0.89)	0.006	< .01
18	94.1	0.85 (0.45-1.00)	0.00	< .001
19	88.9	0.77 (0.35-1.00)	0.001	< .01
20	88.9	1.00 (NA)	0.00	< .001
21	100.0	1.00 (NA)	0.00	< .001
22	100.0	0.75 (0.34-1.00)	0.001	< .01
23	88.9	0.67 (0.37-0.89)	0.003	< .01
24	83.3	0.73 (0.33-1.00)	0.001	< .01
25	88.9	0.75 (0.27-1.00)	0.001	< .01
26	88.9	0.88 (0.62-1.00)	0.00	< .001
27	94.4	0.17 (-0.29-0.64)	0.473	*ns*
28	67.0	0.40 (-0.05-0.75)	0.087	*ns*
29	61.1	0.20 (-0.23-0.65)	0.387	*ns*
30	72.2	0.76 (0.28-1.00)	0.002	< .01
31	88.2	0.50 (0.01-0.87)	0.034	< .05
32	78.0	0.36 (-0.10-0.73)	0.13	*ns*
33	78.0	0.34 (0.00-0.67)	0.138	*ns*
34	67.0	0.25 (-0.20-0.65)	0.289	*ns*
35	67.0	0.57 (0.19-1.00)	0.018	< .05
36	79.0	0.87 (0.49-1.00)	0.00	< .001
37	94.1	0.63 (0.21-1.00)	0.009	< .01
38	83.3	0.87 (0.63-1.00)	0.00	< .001
39	100.0	1.00 (NA)	0.046	< .05
40	100.0	0.73 (0.40-1.00)	0.005	< .01
41	94.1	0.61 (0.11-1.00)	0.009	< .01
42	86.7	1.00 (NA)	0.00	< .001

Table 4

Summary of Types of Items Reportedly Stolen by Category for Study 1 Participants

Types of items reportedly stolen	*N*=
Money	40
Food/drink	37
Electronics	22
Clothing	20
Toys	13
Jewelry	13
Cosmetics	9
Tobacco products	8
Multiple	39
Tobacco only	1
Money only	1
Food/drink only	1

Note: Other items stolen (less frequently) included CDs, appliances, keys, vehicle, life jacket, hand sanitizer, baby supplies, paper towels, napkins, soap, body wash, umbrella, medical supplies, office supplies, personal hygiene items, dolls and stuffed animals, novelty items, towels, wash clothes, books, magazines, wallet, credit card, adult incontinence briefs, flammables, purse, and batteries.

Table 5

Percentage Agreement Scores for Individual Items across Tools

TSI		FAST	
Item	Mean agreement scores	Item	Mean agreement scores
1	63.4	1	65
2	78.6	2	59
3	95.1	3	90
4	86.8	4	82.9
5	72.5	5	64.3
6	94.9	6	85.4
7	94.9	7	84.6
8	97.3	8	75
9	97.5	9	100
10	100.0	10	78.1
11	94.9	11	76.3
12	75.0	12	52.8
13	85.4	13	77.5
14	67.5	14	75.6
15	81.0	15	97.4
16	76.9	16	78.4
17	76.9		
18	87.8		

Notes. For the TSI, items 1-6 correspond to a possible social positive reinforcement function, items 7-12 correspond to a possible social negative reinforcement function, and items 13-18 correspond to a possible nonsocial function. For the FAST, items 1-4 correspond to a possible social positive reinforcement function, items 5-8 correspond to a possible social negative reinforcement function, and items 9-12 correspond to a possible automatic positive reinforcement function, and items 13-16 correspond to a possible automatic negative reinforcement function.

Table 6

Summary of Agreements on Tool Outcomes (Suggested Functions)

	TSI		FAST	
Agreement type	Occurrences	Percentage	Occurrences	Percentage
Agreement, single function	39/42	92.9	27/31	87.1
Agreement, multiple functions	NA	NA	4/11	36.4
Total agreements	39/42	92.9	31/42	73.8
Agreement, social vs. non-social	39/42	92.9	19/42	45.2
Agreement, single function (observed 3 or > in last 12 months)	6/7	85.7	2/3	66.7
Agreement, multiple functions (observed 3 or > in last 12 months)	NA	NA	2/4	50.0
Total agreements (observed 3 or > in last 12 months)	6/7	85.7	4/7	57.1

Note. Overall mean outcome agreement for TSI vs. FAST was 42.9%.

Table 7

Number and Percentage of Cases for Which Categories of Behavioral Function were Suggested by Tool Outcomes with Mean IRA Percentages (N= 42)

	TSI			FAST		
Function	Number	Percentage	IRA	Number	Percentage	IRA
Social Sr+	3	7.1	82	35	83.3	74.8
Social Sr-	0	0	93.9	3	7.1	77.5
*Automatic Sr+	39	92.9	79.5	16	38.1	76.3
Automatic Sr-	NA	NA	NA	0	0	82.2

**Note: Characterized as a nonsocial reinforcement function on the TSI.*

Table 8

Item by Item Comparison of FAST IRA Scores from Iwata et al. (2013) and the Current Study

Item	Iwata et al. agreement scores	Current study agreement scores	*Change direction*
1	70.8	65	↓
2	78.6	59	↓
3	66.5	90	↑
4	84.5	82.9	↓
5	70.6	64.3	↓
6	67.9	85.4	↑
7	67.5	84.6	↑
8	75.9	75	≈
9	77.4	100	↑
10	71.1	78.1	↑
11	69.1	76.3	↑
12	53.3	52.8	↓
13	70.2	77.5	↑
14	80.3	75.6	↓
15	69.9	97.4	↑
16	75.0	78.4	↑

Note: Increases and decreases in IRA scores from Iwata et al. to the current study are denoted by up arrows and down arrows, respectively. The ≈ symbol denoted that scores were essentially unchanged.

Table 9

Study 2 Participant Characteristics and Tool Outcomes from Study 1

Participant	Age	TSI	FAST	Stealing Background
Mabel	35	*Outcome*: Nonsocial Sr+ *Agreement*: Yes *Tool IRA*: 83.3% *FAST agreement*: No	*Outcome*: Social Sr+ *Agreement*: Yes *IRA*: 92.3%	*Frequency*: Weekly to monthly *Targets*: Food/drink, money, toys, clothing, baby supplies, electronics *Locations*: School, store, home, office, church *Intervention plan*: Yes
Colten	14	*Outcome*: Nonsocial Sr+ *Agreement*: Yes *IRA*: 100% *FAST agreement*: No	*Outcome*: Social Sr- *Agreement*: Yes *IRA*: 86.7%	*Frequency*: Weekly *Targets*: Food/drink, money, electronics, toys, clothes *Locations:* Therapy center, school *Intervention plan*: Yes
Lydia	53	*Outcome*: Nonsocial Sr+ *Agreement*: Yes *IRA*: 88.9% *FAST agreement*: No	*Outcome*: Social Sr+ *Agreement*: Yes *IRA*: 80%	*Frequency*: Weekly to monthly *Targets*: Food/drink, money, electronics, clothes, cosmetics *Locations:* Work, home *Intervention plan*: Yes
*Jenson	34	*Outcome*: Nonsocial Sr+ *Agreement*: No *IRA*: 77.7% *FAST agreement*: No	*Outcome*: Social Sr+ *Agreement*: Yes *IRA*: 85.7%	*Frequency*: Daily to biweekly *Targets*: Food/drink, electronics *Locations:* Stores, home *Intervention plan*: Yes
Celia	55	*Outcome*: Nonsocial Sr+ *Agreement*: Yes *IRA*: 94.4% *FAST agreement*: Yes	*Outcome*: Nonsocial *Agreement*: Yes *IRA*: 100%	*Frequency*: Daily to weekly *Targets*: Food/drink, cosmetics, purses, rags/cloths, office supplies *Locations:* School, stores, work, home *Intervention plan*: Yes
Wyatt	61	*Outcome*: Nonsocial Sr+ *Agreement*: Yes *IRA*: 88.9% *FAST agreement*: No	*Outcome*: Social Sr+ *Agreement*: Yes *IRA*: 86.7%	*Frequency*: Weekly *Targets*: Food/drink, money, electronics, toys, clothes *Locations:* Stores, work, home *Intervention plan*: No

**Note: Previously arrested.*

Table 10

Comparison of FA Model Characteristics

	Naturalistic FA	Analog FA
Setting	Home or usual therapy room (Colten)	Office, FA room, or atypical therapy room (Colten)
Ruse	Staff meeting	Ostensive job
Area vacated after trials	Yes	Yes
Number of items embedded per trial	2	12
Change embedding locations across trials	Yes	No
Change items baited across trials	Yes	No

Table 11

Summary of FA Conditions and Procedures

	Alone	Extended Alone	Attention	Escape (Colten)	Control
Therapist present	No	No	Yes	Yes	Yes
Type of MO	EO (item)	EO (item)	EO (attention withheld)	EO (academic demands)	AO (NCR attention + MP items, no demands)
Consequence for stealing	Access to item	Access to item	1-min of attention	Demand termination	No social consequences
Item preference important?	Yes	No	No	No	NA
Items embedded	*Natural*= HP pairs *Analog*= 4 HP/MP + 8 LP	*Natural*= LP pairs *Analog*= 12 LP	*Natural*= LP pairs *Analog*= 12 LP	*Natural*= LP pairs *Analog*= 12 LP	*Natural*= LP pairs *Analog*= 12 LP

Table 12

Stealing Targets Embedded during FAs across Participants (Including Number Embedded per Trial in Parentheses)

	Naturalistic FA		Analog FA	
	Alone	Pairwise Analyses	Alone	Pairwise Analyses
	HP	LP	HP/MP	LP
Mabel	Pajamas, diapers, First Keys toy, Flaming Hot Cheetos®, Goldfish®, blanket	Olives, door stop	Pajamas, diapers, First Keys toy, Flaming Hot Cheetos®	Olives, door stop, dental floss, 9V battery, stickers, quarters (2), blouse, bottled water, scrunchie, sanitizer, carrots, *flip phone
Colten	Broken iPhone 4s, Reese's THiNS (5), fidget spinner, Chips Ahoy! (5), *Heroes Military toys (army men)	Olives, dill pickles, dental floss, stickers (8)	Broken iPhone 4s, Reese's THiNS (5), fidget spinner, Heroes Military toys (2)	Dill pickles, black olives, 9V battery A, 9V battery B, stickers (8), birthday candle, dental floss, scotch tape, scrunchie, plastic hooks, sanitizer, liquid paper
Lydia	Flip phone, liquid paper, paper clips, olives (6), broken I-phone 4s, Funyons®	9V battery, scrunchie	Flip phone, Samsung Blackjack (no battery), broken I-phone 4s, olives (6)	Dental floss, 3 separate 9V batteries, cardigan, blouse, stickers (8), scrunchie, birthday candle, carrots or cookie, plastic hooks, jacket
Jenson	Flip phone, bottled water, Goldfish®, charger cord, Ritz Bitz, earbuds	Olives, door stop	Flip phone, bottled water, Goldfish®, earbuds	Door stop, scotch tape, 9V battery, playing cards (32), stickers (8), DVD, paper clips, plastic hooks, dental floss, scrunchie, birthday candle, olives
Celia	Body spray, blue rag, Pringles®	9V battery, olives	Body spray, blue rag, Pringles®, orange rag	9V battery, olives, stickers (8), scrunchie, birthday candle, carrots (6), plastic hooks, more carrots (6), wash cloth, olives (6), door stop, more olives (6)
Wyatt	Hershey's Kisses (3), Walkman radio	9V battery, dental floss	Hat, Hershey's Kisses (3), Walkman radio, more Hershey's Kisses (3)	9V battery, stickers (8), more stickers (8), birthday candle, dental floss, scotch tape, hand sanitizer, bottled water, liquid paper, another 9V battery, door stop, scrunchie

Table 13

Summary of Agreements (Matches) between Study 1 Tool Outcomes and FA Outcomes for the Three Participants that Stole during One of the FA Models

	Matches by FA Model			
Tools	Naturalistic	Analog	Total	Predictive Utility
TSI	2/2	1/1	3/3	100%
FAST	0/2	0/1	0/3	0%

Table 14

Preliminary Functional Treatment Taxonomy for Stealing

Treatments	*Nonsocial reinforcement	Behavioral function Social positive reinforcement	Social negative reinforcement
Reinforcement and extinction	DRO (e.g., Page et al., 1983a/1983b; Switzer et al., 1977; Vogl & Rapp, 2011) Treat impulsivity (e.g., Dixon et al., 1998, Lambert et al., 2019; Logue; 1995; Stumphauzer, 1970); Correspondence training (Bevill-Davis, Clees, & Gast, 2004; Burron & Bucher, 1978; Hartig & Kanfer, 1973; Lloyd, 2002; Monahan & O'Leary, 1971; O'Leary, 1968); DRA (e.g., reinforce prosocial behaviors like submitting items that are misplaced or left lying around)	Contingent access to attention or other social positive reinforcers via DRO (e.g., Luiselli & Pine, 1999; Wetzel, 1966); or DRA (Hackenberg, 2018; Kazdin, 1982; Kazdin & Bootzin, 1972; Liberman, Ferris, Salgado, & Salgado, 1975; Phillips, 1968; Phillips, Phillips, Fixsen, & Wolf, 1971); consider job training and employment assistance if money is stolen	Social skills training to teach assertiveness for thwarting coercive peer pressure and responding to and reporting mistreatment (Bates, 1980; Bornstein et al., 1977; Sievert et al., 1988)
Punishment	Verbal reprimand (Rosen & Rosen, 1983); response cost (e.g., Kraft, 1970; Reid & Patterson, 1976 Rosen & Rosen, 1983); stimulus control (Rosen & Rosen, 1983; Simmons et al., 2019); overcorrection (Azrin & Armstrong, 1973; Azrin & Wesolowski, 1974)		

Notes: Strategies for treating stealing maintained via non-social reinforcement may be considered default strategies in that their selection does not logically derive from FA results (e.g., in the way that using access to attention to strengthen alternative responses to attention-maintained aggression does). Such strategies are not necessarily limited in their relevance to the nonsocial category, though.

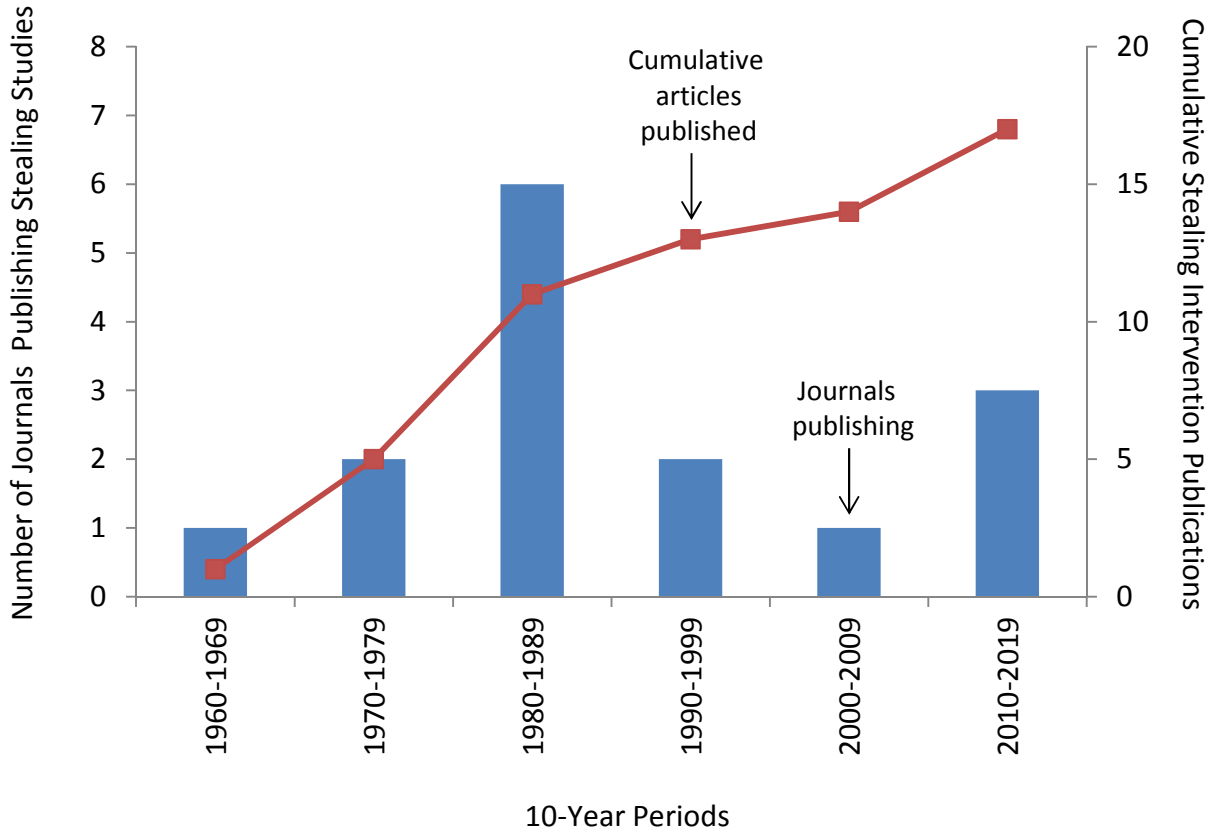


Figure 1. Cumulative number of peer-reviewed articles with behavioral interventions for stealing and total number of journals publishing such articles across 10-year periods (1960-2019).

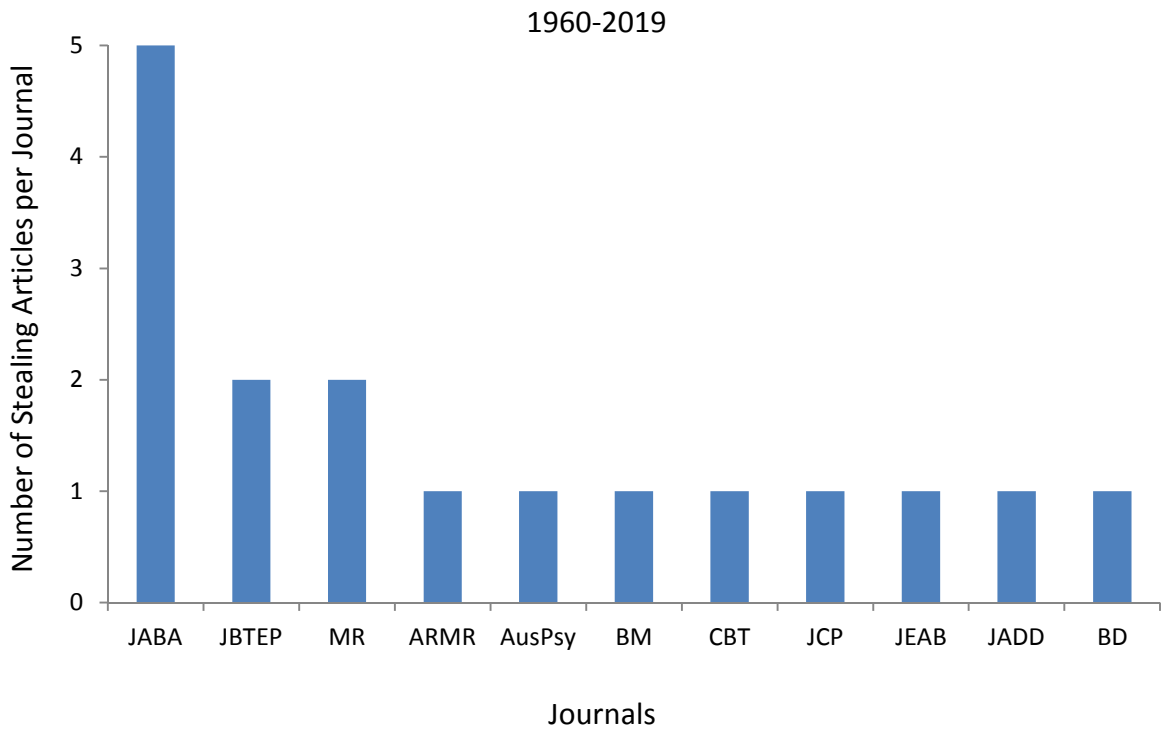


Figure 2. Journals publishing peer-reviewed, behavior analytic articles on stealing interventions from 1960 to 2019. ARMR= *Applied Research in Mental Retardation*, AusPsy= *Australian Psychologist*, BD= *Behavioral Development*, BM= *Behavior Modification*, CBT= *Child Behavior Therapy*, JABA= *Journal of Applied Behavior Analysis*, JADD= Journal of Autism and Developmental Disorders, JBTEP= *Journal of Behavior Therapy and Experimental Psychiatry*, JEAB= *Journal of the Experimental Analysis of Behavior*, JCP= *Journal of Consulting Psychology*, MR= *Mental Retardation*

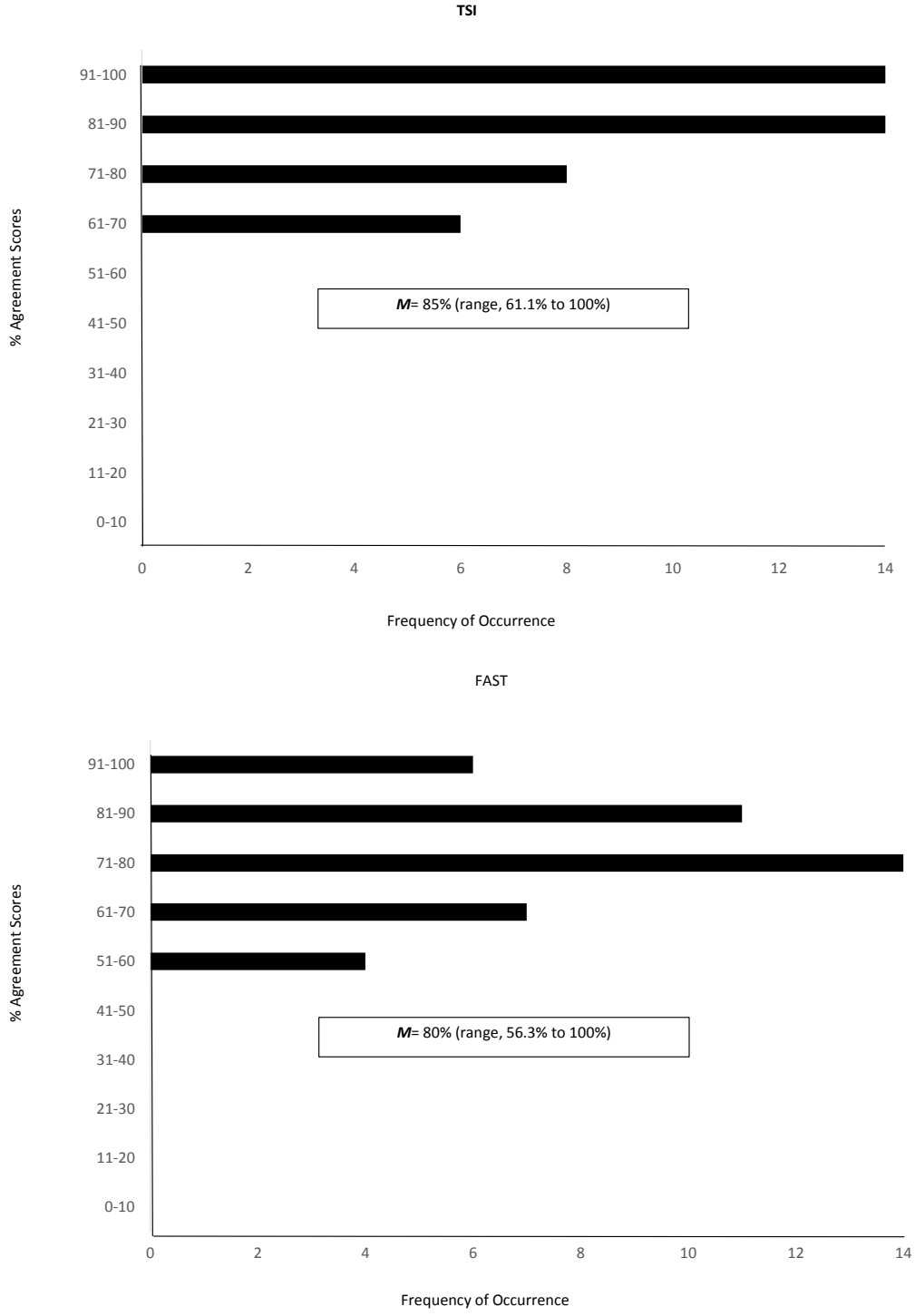


Figure 3. Frequency distribution of percentage agreement scores (overall tool IRA) for item by item comparisons between primary and secondary respondents for the TSI and FAST (N= 42 respondent pairs)

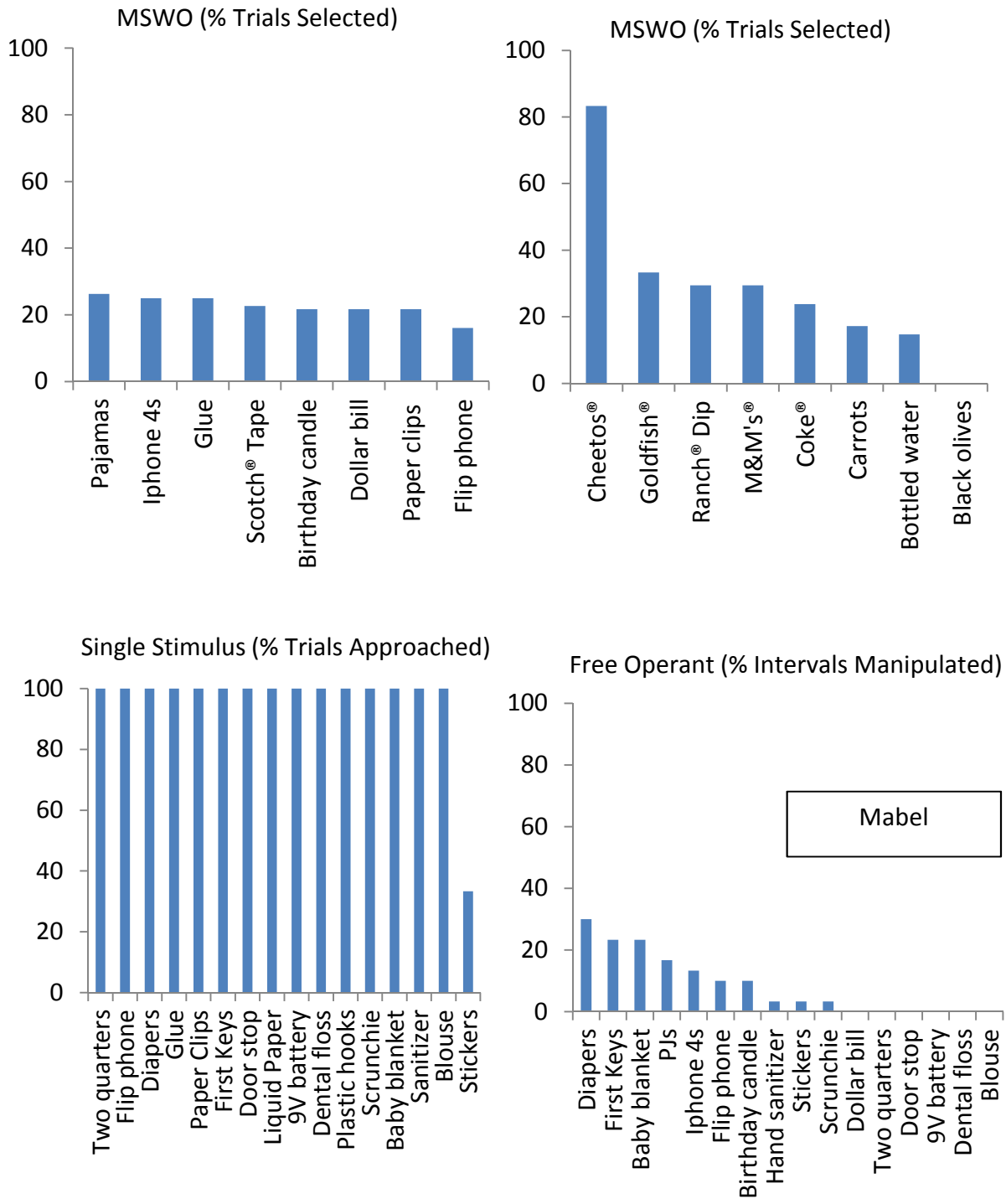


Figure 4. Results of stimulus preference assessments for Mabel measured as percentage of trials selected (MSWO), percentage of trials approached (single stimulus), and percentage of intervals manipulated (free operant).

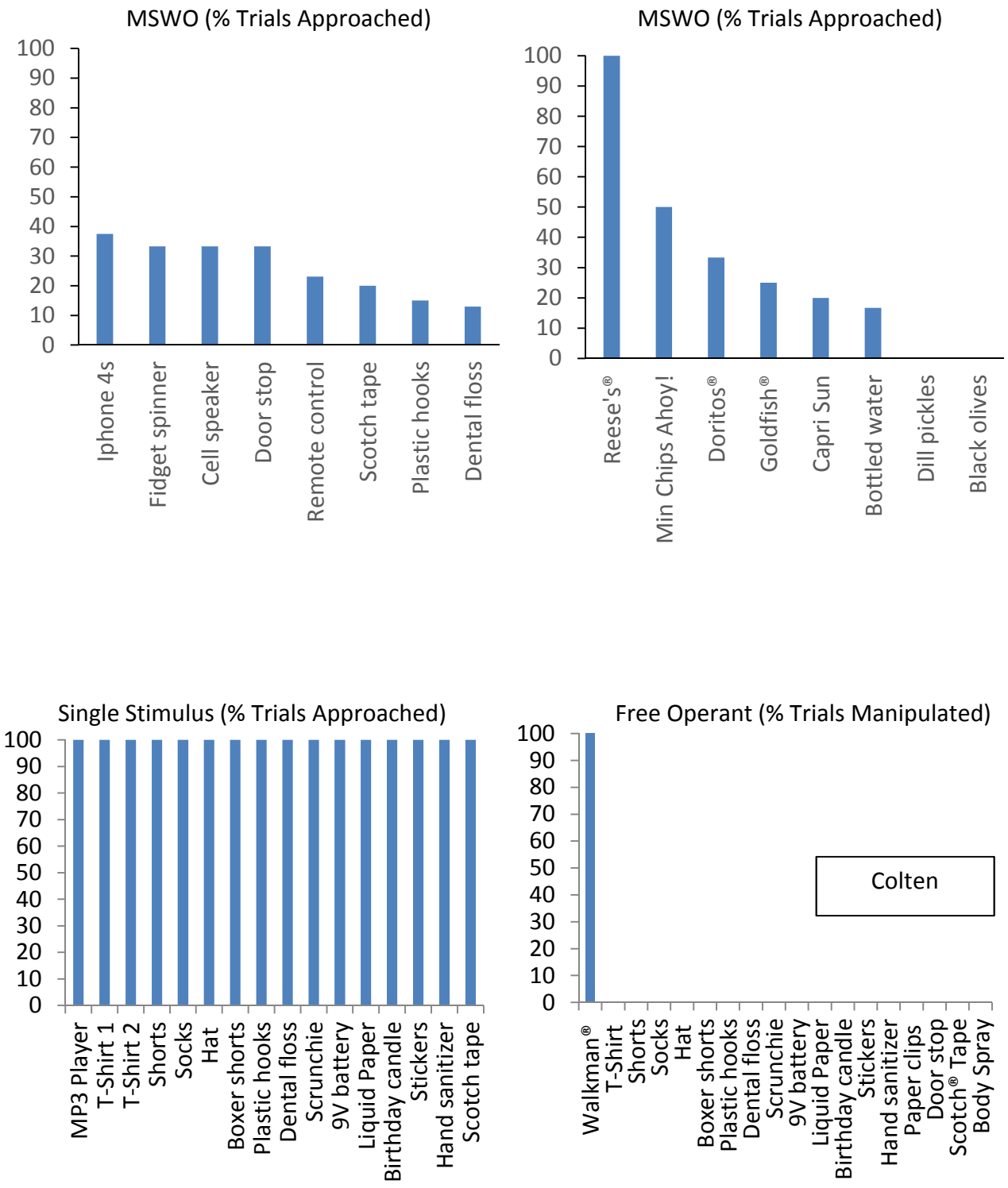


Figure 5. Results of stimulus preference assessments for Colton measured as percentage of trials selected (MSWO), percentage of trials approached (single stimulus), and percentage of intervals manipulated (free operant).

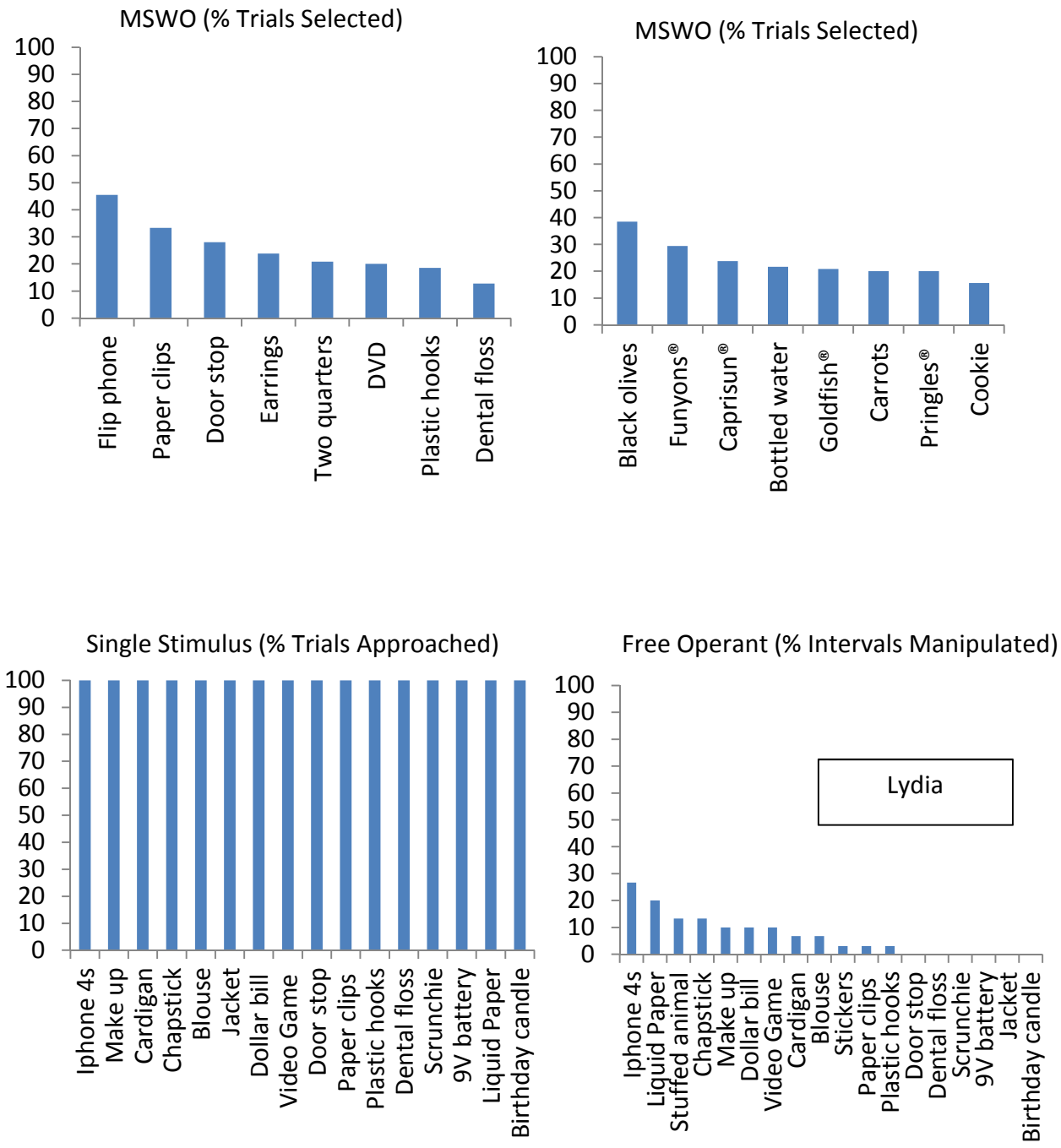


Figure 6. Results of stimulus preference assessments for Lydia measured as percentage of trials selected (MSWO), percentage of trials approached (single stimulus), and percentage of intervals manipulated (free operant).

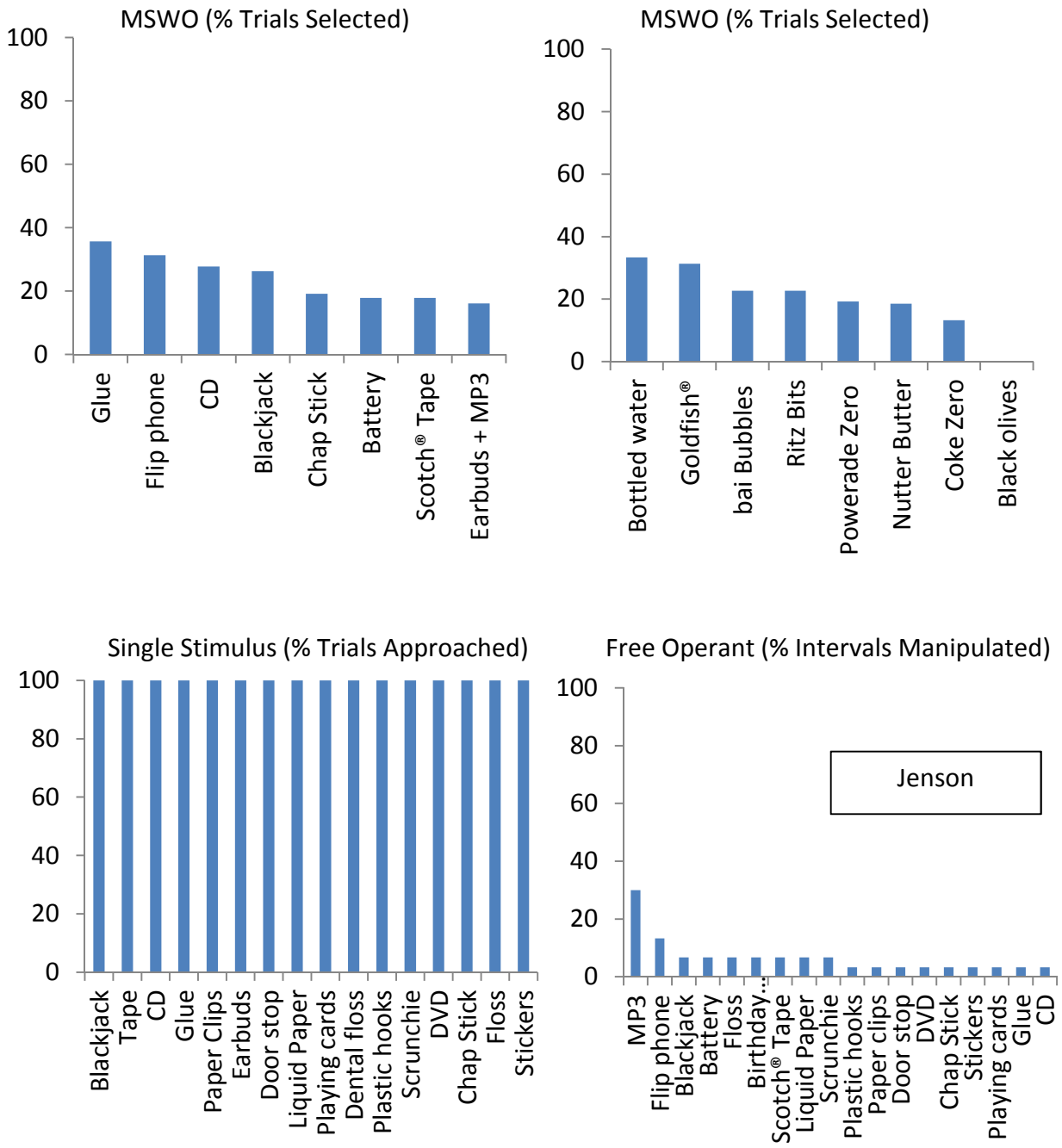


Figure 7. Results of stimulus preference assessments for Jenson measured as percentage of trials selected (MSWO), percentage of trials approached (single stimulus), and percentage of intervals manipulated (free operant).

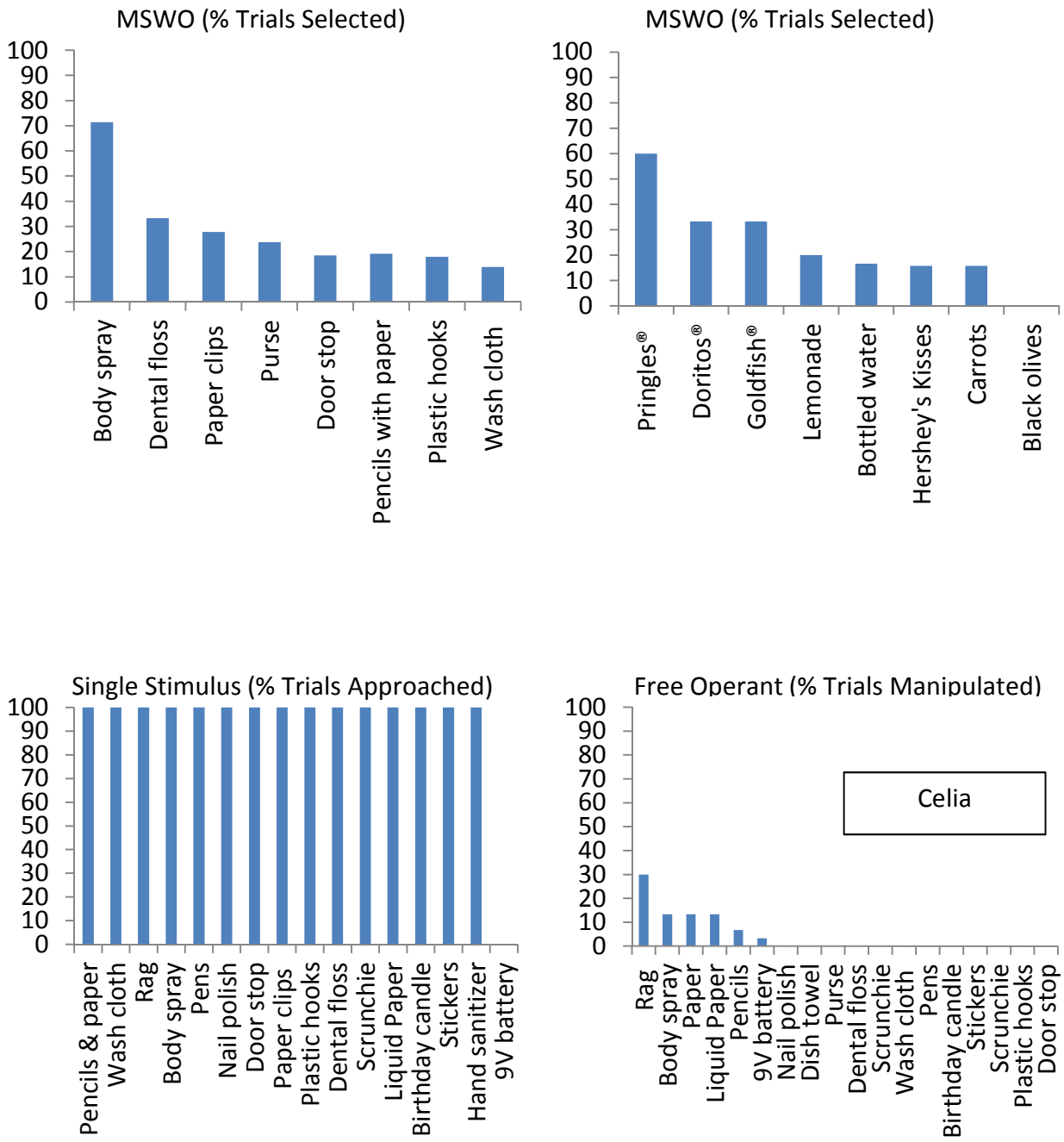


Figure 8. Results of stimulus preference assessments for Celia measured as percentage of trials selected (MSWO), percentage of trials approached (single stimulus), and percentage of intervals manipulated (free operant).

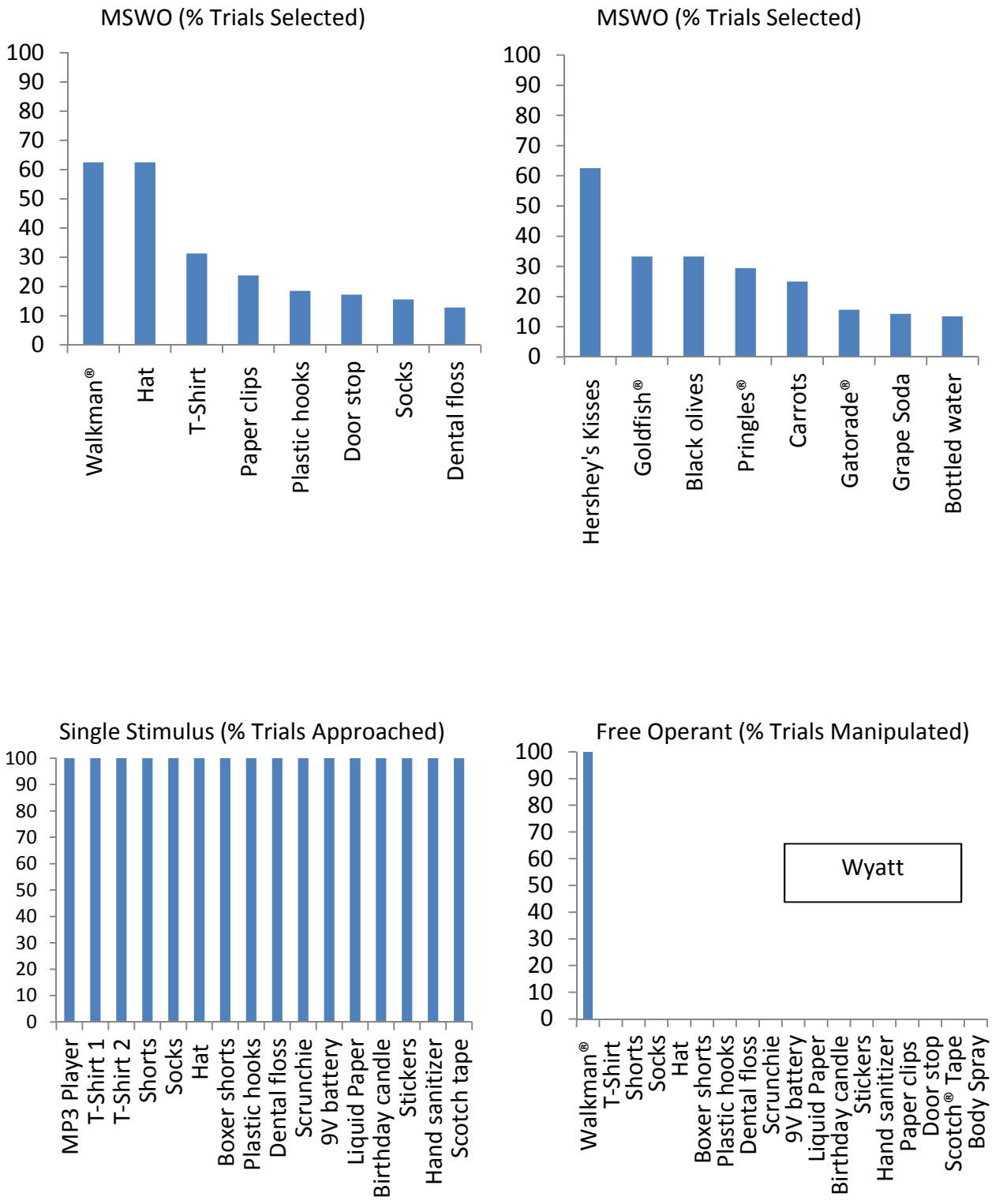
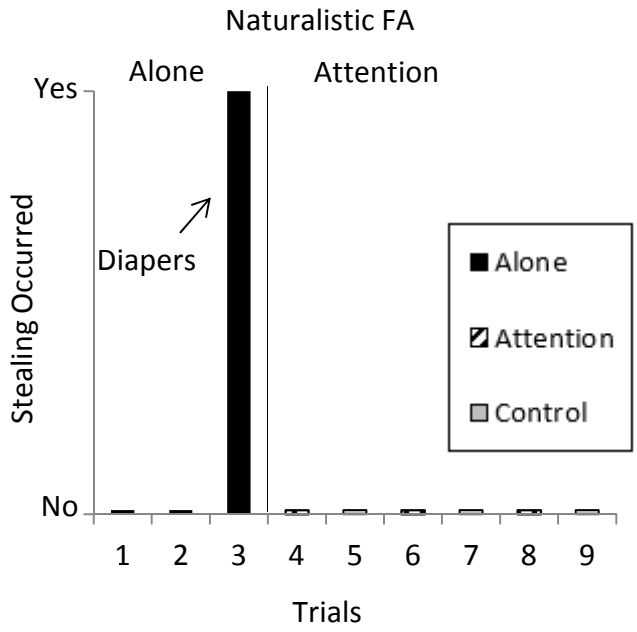
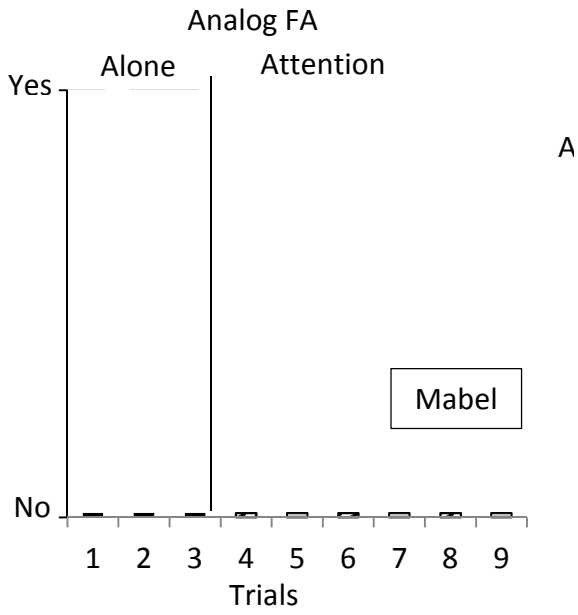
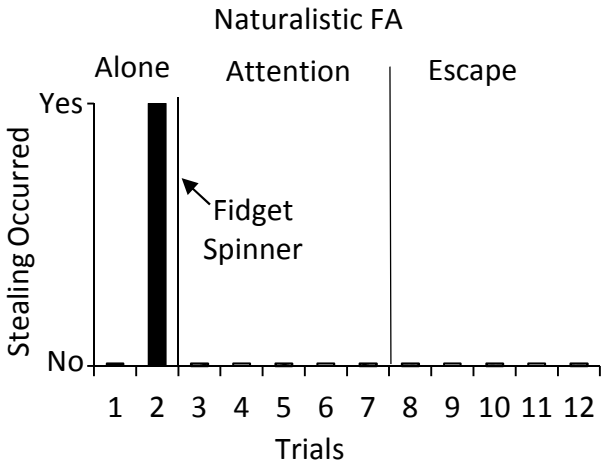


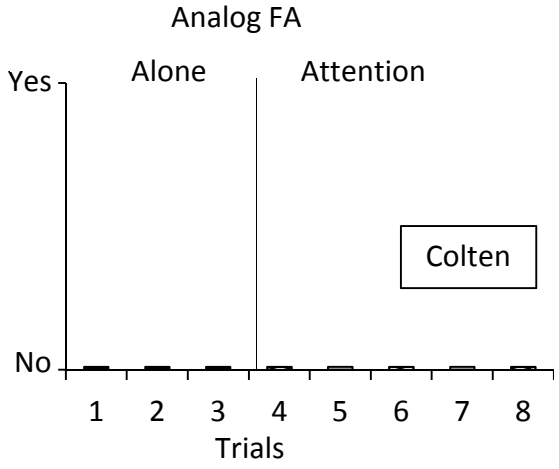
Figure 9. Results of stimulus preference assessments for Wyatt measured as percentage of trials selected (MSWO), percentage of trials approached (single stimulus), and percentage of intervals manipulated (free operant).





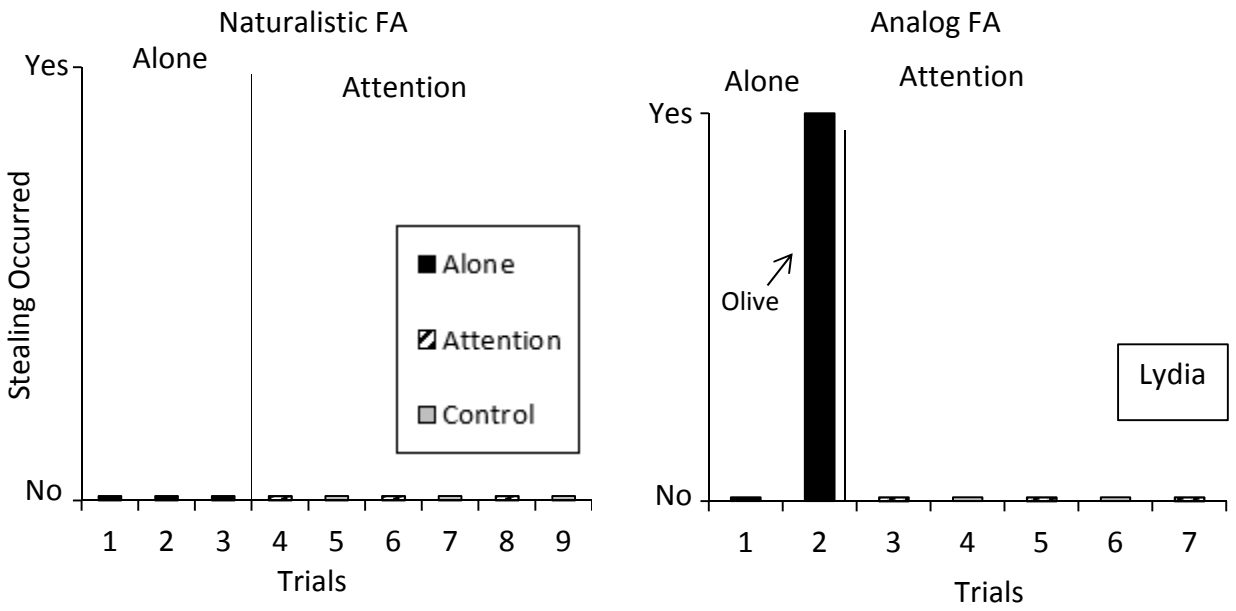
	Nonsocial	Social S+	Social S-	Naturalistic Match	Analog Match
FAST	5	7	2	No	Inconclusive
TSI	9	3	1	Yes	Inconclusive



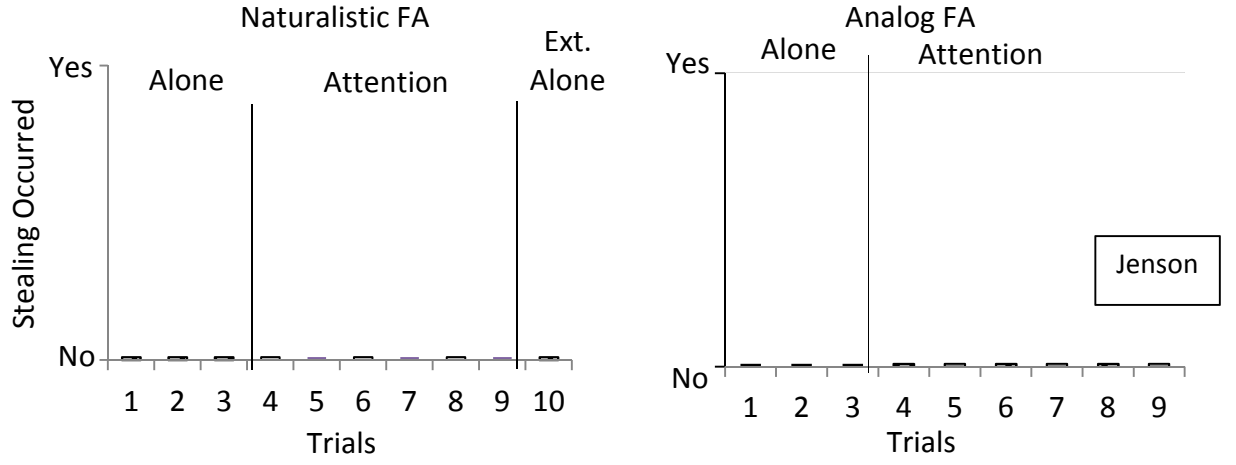


	Nonsocial	Social Sr+	Social Sr-	Naturalistic Match	Analog Match
FAST	4	5	7	No	Inconclusive
TSI	8	2	0	Yes	Inconclusive

Figure 10. FA results (above) for naturalistic and analog methods with FAST and TSI raw functional category outcome scores (bottom) summed across raters for Mabel and Colten.

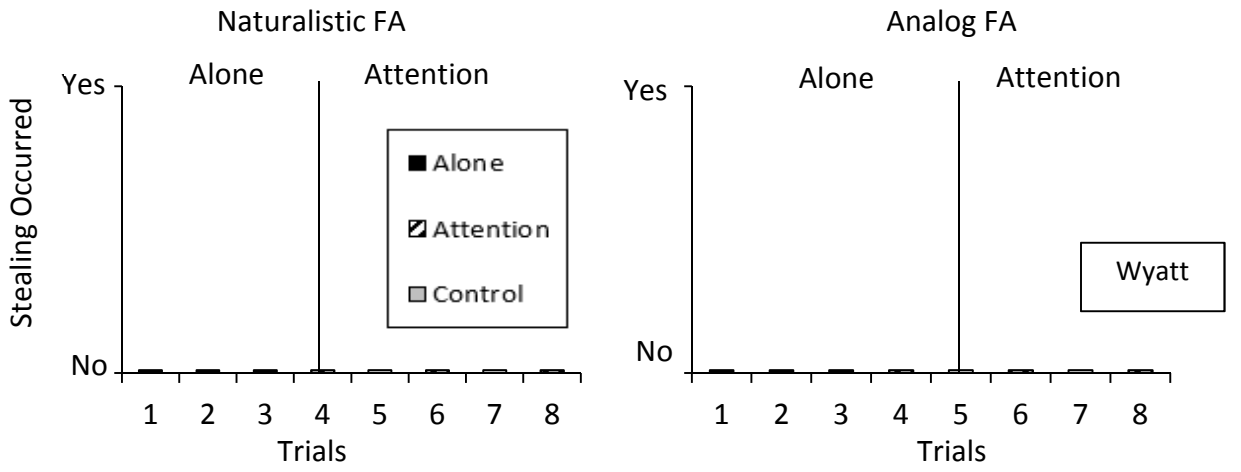


	Nonsocial	Social S+	Social S-	Naturalistic Match	Analog Match
FAST	6	8	3	Inconclusive	No
TSI	7	2	1	Inconclusive	Yes

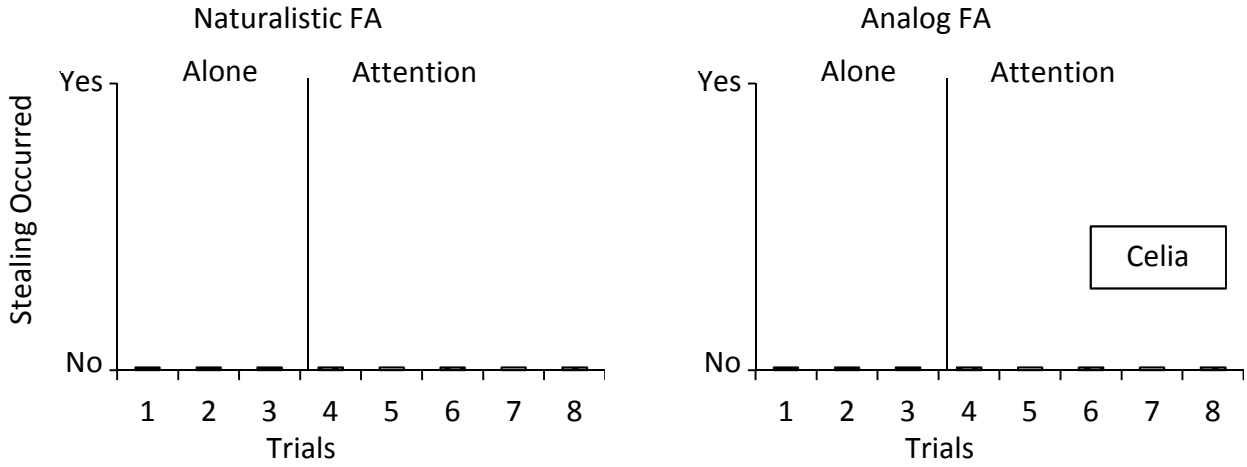


	Nonsocial	Social Sr+	Social Sr-	Naturalistic Match	Analog Match
FAST	5	5	0	Inconclusive	Inconclusive
TSI	8	7	1	Inconclusive	Inconclusive

Figure 11. FA results (above) for naturalistic and analog methods with FAST and TSI raw functional category outcome scores (bottom) summed across raters for Lydia and Jenson.



	Nonsocial	Social Sr+	Social Sr-	Naturalistic match	Analog match
FAST	10	4	4	Inconclusive	Inconclusive
TSI	10	2	1	Inconclusive	Inconclusive



	Nonsocial	Social Sr+	Social Sr-	Naturalistic match	Analog match
FAST	5	6	3	Inconclusive	Inconclusive
TSI	9	3	0	Inconclusive	Inconclusive

Figure 12. FA results (above) for naturalistic and analog methods with FAST and TSI raw functional category outcome scores (bottom) summed across raters for Wyatt and Celia.

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FOOTNOTES

[1]Outside of the behavioral literature pertaining to delinquent behavior, most authors have characterized prevention and treatment as requiring a comprehensive effort involving treatment packages, often with disparate components, that attempt to mitigate multiple risk factors or bolster protective factors (see reviews by Lipsey & Wilson, 1999; Catalano, Arthur, Hawkins, Berglund, & Olson, 1998; Wasserman & Miller, 1998). This line of thinking was illustrated by Wasserman and Miller (1998, p. 246-247) who wrote, "Child antisocial behavior emerges from the convergence of multiple risk factors; designating any single factor as a target for change is unlikely to be a successful intervention strategy." However, development and validation of individual components, particularly in the neglected area of stealing, is important. Another issue that hinders development of interventions specific to stealing is that this behavior is often subsumed within broader categories like "anti-social behavior", "juvenile delinquency", and "conduct disorder" (see Ingamells & Epston, 2013; Miller & Moncher, 1988; Patterson, 1974; Robins, 1986; Seymour & Epston, 1989).

[2]The study by Ayllon and Michael (1959) in which operant learning principles were applied to addressing problems of social importance for individuals with psychiatric and intellectual disabilities has been cited as pivotal in the early establishment of ABA as a formal discipline (Cooper, Heron, & Heward, 2007). Given the seminal nature of that article, the year 1959 seemed like an appropriate starting point for the search.

[3]An exception might involve food stealing exhibited by some individuals with intellectual and developmental disabilities (e.g., Altman, Bondy, & Hirsch, 1978; Henriksen & Doughty, 1967; Page et al., 1983).

[4]Interestingly, Edward L. Thorndike, a prominent, pre-Skinnerian proponent of the role of consequences in determining situational behavior (i.e., "law of effect"), served as supervisor and advisor to Hartshorne and May (1928).

[5]Food stealing and related obesity and health concerns are common features of Prader-Willi syndrome (see Altman, Bondy, & Hirsch, 1978; Page, Finney, Parrish, & Iwata, 1983; Page, Stanley, Richman, Deal, Iwata, 1983; Pipes & Holm, 1973; Rone, 2010; Thompson, Kodluboy, & Heston, 1980).

[6]In Smith et al. (1983), experimental control was weak due to variability in baselines, including a clear decreasing tend during breakfast while intervention occurred during lunch.

APPENDIX A

CORRESPONDENCE

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APPENDIX B

THE STEALING INVENTORY (TSI)

Code: _____ Date:_____

List age: ____Adult ____Child ____IDD ____Psy

Setting: ____School ____Community ____Psych ____Home ____Other ( )

Informant-Client Relationship

1. Indicate informant's relation to the client
   ___ Parent ___ Teacher ___ Staff ___ Other
2. How long have you known the person?
   ___ Years ___ Months
3. Have you seen him/her take things? ___Y ___ N
   # of times last 12 months ___ 3 or > ___ 1-2 ___ 0

Problem Behavior Information

1. Other problem behaviors (check all that apply)
   ___ Physical aggression ___ Elopement
   ___ Verbal aggression ___ Lying
   ___ Property disturbance ___ Noncompliance
   ___ Other (list:)
2. When did the person first start taking things?
3. How often does the person take things?
   ___ Daily ___ Weekly ___ Biweekly
   ___ Monthly ___ Less than monthly
4. What does the person take? (check all that apply)
   ___ Coins ___ Food/drink ___ Cosmetics
   ___ Cash ___ Electronics ___ Clothing
   ___ Tobacco ___ Toys ___ Jewelry

   Other specific items:
5. What is the maximum value of items taken?
   ___ Up to $10 ___ Up to $50 ___ Up to $100
   ___ > $100
6. ___ # arrests ___ # prosecuted ___ # suspensions
7. From where does the person take things?
   ___ School ___ Stores ___ Work ___ Home
   ___ Restaurants ___ Other (list:)
8. What happens just *before* the person takes things?
9. What happens right *after* the person takes things?
10. What does the person do with the items taken?

Specific Function-Based Questions

1.	When s(he) takes something, does s(he) share it, show it, or talk about it?	Y	N NA
2.	Does the person brag about taking things from others?	Y	N NA
3.	When caught taking things, do family members, teachers, peers, or others talk to him/her about the behavior?	Y	N NA
4.	Do the person's friends react positively toward her/him when s(he) takes things or does s(he) gain friends by taking things?	Y	N NA
5.	Does s(he) give the items taken to others as gifts?	Y	N NA
6.	Do others give her/him money or other things in exchange for the items that s(he) takes? If so, what things_____?	Y	N NA
7.	Do peers demand or repeatedly ask her/him to take things?	Y	N NA
8.	When the person takes things, do peers stop asking her/him to do so?	Y	N NA
9.	Do peers or others criticize or make fun of her/him for ***not*** taking things?	Y	N NA
10.	The person does ***not*** take things unless peers insist that s(he) do so.	Y	N NA
11.	Do others threaten to stop being friends with her/him if s(he) doesn't take things?	Y	N NA
12.	Does s(he) take things from others who have mistreated her/him?	Y	N NA
13.	Is s(he) usually alone or unaccompanied when s(he) takes things?	Y	N NA
14.	Does the s(he) only take things that s(he) really seems to want or enjoy?	Y	N NA
15.	Does s(he) avoid telling others (including peers) when s(he) takes things?	Y	N NA
16.	Does s(he) use or consume the item shortly after taking it and while alone?	Y	N NA
17.	Is s(he) less likely to take things that s(he) already has?	Y	N NA
18.	Does s(he) try hard to avoid being caught by others, including peers?	Y	N NA

Scoring Summary ⟶	**Items Circled "Yes"**	**Total**	**Potential Source of Reinforcement**
Circle the # for each question that was answered "Yes" and enter the number of circled items in the "Total" column.	1 2 3 4 5 6	____	Social (attention/tangibles/money)
	7 8 9 10 11 12	____	Social (escape pressure/retaliation)
	13 14 15 16 17 18	____	Nonsocial (tangibles/money)

APPENDIX C

ADMINISTRATION GUIDE FOR THE TSI

Building Rapport and Basic Information

Administration of the TSI should begin with establishing rapport and trust so as to increase the likelihood of gaining cooperation and truthful responses. As such, the interviewer should begin with a personal introduction and making brief casual conversation (such as about the weather or current events). The interviewer should indicate that the purpose of the interview is to gain an understanding of the target individual's history of taking things from others and the contexts under which this typically occurs. Because some interviewees may be opposed to characterizing the individual's behavior as stealing, the phrase "taking things" should be used throughout. Personal information should be obtained including the target individual's age, general diagnostic category, and setting for which the relationship between the interviewee and individual exists.

Informant-Client Relationship

In this section, the administrator will inquire as to the interviewee's relationship to the target individual, length of the relationship, and the extent to which the interviewee has observed the individual (first-hand) taking things from others.

Problem Behavior Information (Left Column)

Generally, this section includes questions designed to better understand the nature, context(s) and severity of the behavior and any co-occurring behaviors. Interviewees will be requested to provide answers for questions that can be reasonably answered (or estimated) based on first-hand information or reliable second-hand information. Interviewees will be asked to refrain from making uninformed guesses or speculating. For questions that have multiple listed

options, the options will be read to the interviewee and examples will be given as needed. For instance, when reading question #1, the administrator will name each behavior and provide several examples. For example, the administrator might state that physical aggression involves engaging in behaviors directed toward others such as hitting, kicking, biting, pushing, shoving, pinching, and so forth. Similarly, the administrator might state that verbal aggression means cursing at people, name-calling, or making threats, and so on. Whenever "other" is listed as an option, the interviewee will be asked if other options apply. For example, after determining whether or not the client has ever taken the things listed in #4, the administrator will inquire as to whether the individual has taken any other things. If the interviewee indicates that the individual has taken items in a general category (#4) such as electronics, the administrator will probe for specific examples (e.g., cell phones, video games, video game systems, MP3 players, etc.). Generally, the administrator should offer clarification when the interviewee requests it or might benefit from it (as suggested by delayed answering or answers that do not cohere logically with the intent of the question, etc.).

Questions on the Function of Stealing (Right Column)

This section includes questions aimed at understanding the specific sorts of potentially relevant antecedents and developing preliminary hypotheses regarding the function(s) of stealing. Start by telling the interviewee that you will now be asking some specific questions about what is happening during the times that the individual has taken things that don't belong to him. Next, the interviewee will be told that answering "Yes" will indicate agreement with what the question says and answering "No" will indicate disagreement with what the question says. Lastly, the interviewee will be told that if he or she is uncertain how to answer a question (perhaps due to having insufficient knowledge or failure of recall) that a response of "I don't

know" (or something similar) should be given. These latter responses will be recorded as "NA". Each question will be prefaced with the phrase, "Do you have reason to believe that _____?" This phrase is meant to convey that it is acceptable to rely upon both first-hand information and reliable non-first-hand information when giving answers. Generally, the administrator should offer clarification when the interviewee requests it or might benefit from it (as suggested by delayed answering). For example, clarification of question #1 might entail giving examples of types of attention that might have followed instances of taking things in the past (such as friends telling the client that they are impressed with his stealing skills or his bravery or lengthy discussions adults about how taking things from others is wrong). For questions #12 and #17, the administrator will offer examples to add clarity along with stating the questions. For instance, after reading question #12, the administrator will allude to possible types of mistreatment including (but not limited to) having been a victim of theft or the target of others' verbal or physical attacks or having discovered that someone was flirting with his girlfriend, etc. Similarly, upon reading question #17, the administrator will offer several examples of relevant AOs. One such example might be, "If she has a new pair of shoes, is she less likely to take others' shoes at that moment?" Another example might be, "If he has $20.00, is he less likely to take others' money at that moment?" To the extent that specific items were indicated in the *Problem Behavior Information* section (question #4) as being targets of the individual's thefts, then those items should be incorporated into the examples given.

Scoring Summary (Bottom)

For each Stealing FAST question, circle the numbers in the *Scoring Summary* that correspond to each of the questions marked "Yes" (above the Scoring Summary in the right-hand column). For each functional category listed under Potential Sources of Reinforcement, total

the number of items circled. The functional category with the highest number reflects the suggested function of stealing. For example, if 5 out of the 6 questions pertaining to Social (attention/tangibles/money) were circled (indicating "Yes" responses) and no other category had as many items circled, then the suggested function is access to social reinforcement (attention/ tangibles/money).

APPENDIX D

SCRIPT FOR THE EXTENDED ALONE TRIAL

Before Going to your Office

1. Have several leisure items and activities available in living area
2. Tell participant to engage in activities in the living area
3. Tell participant you will be busy in your office for 30 min
4. Ask participant not to interrupt you unless emergency
5. Go to your office

While in your Office

6. When you are alone in your office, text Brandon at XXX-XXXX
7. Start the 60-min countdown timer
8. Stay in your office with door slightly open until Brandon returns
9. If the participant enters your office, briefly direct him away
10. Without being seen, briefly and quietly check on participant every 15 min
11. If participant is in his bedroom, direct him to activities elsewhere
12. If stealing occurs, do not make comments about it

If Something Goes Wrong

13. If an emergency or crisis occurs, stop the trial, attend to the participant as needed, and text Brandon
14. Text Brandon if anyone other than the participant enters the home, if the participant refuses to leave his bedroom, if the participant enters the office more than 3 times, or if the participant remains at the entry to or inside of the office for longer than 1 min

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