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CREATING “CHICKS WHO FIX”: WOMEN, TOOL KNOWLEDGE, AND HOME REPAIR, 1920–2007

AMY BIX

Encouraging American women to become “Mrs. Fixit,” Martha Wirt Davis declared in 1936: “There is quite a bit of satisfaction in being able to . . . put new washers in leaky faucets or replace burned-out fuses without calling for male assistance” (Davis 1936, 44). Seventy years later, after installing faucets, light fixtures, and tiles, homeowner Mary Caputo-Kamerer boasted, “My children know that Mom uses the power tools in the family, and they come to me when something needs to be repaired” (Baker and Jarrin 2006, 7). Across the years, these women’s shared interest in home repair defied social stereotypes that more often assigned tools to a father, husband, or professional handyman. After World War I, home economics professionals promoted manual ability as essential for modern wives. Domestic engineering classes, women’s magazines, and Girl Scouting let women construct their own technical learning environments, offering social reinforcement for mastering new hands-on skills. Post–World War II cultural reassertions of traditional gender roles remasculinized home repair, and by the 1950s, Steven Gelber wrote, “the very term ‘do-it-yourself’ would become part of the definition of suburban husbanding” (2000, 71). Yet even then, women never entirely ceded the toolbox, and 1970s second-wave feminism provided a new framework connecting tool skills to independence and equality. After 1990, big corporations and women entrepreneurs capitalized on rising rates of female-headed households and home ownership as marketing opportunities. Home renovation shows made repairwomen celebrities; they combined solid technical information with emotional appeal to sell other women on tool use as a vehicle for material pleasure, self-expression, and personalized empowerment.

This history of women and repair complicates the picture held by twentieth-century Americans of tool use, whereby they still often presumed such activity to be male. The ideal of tools as a medium for father-son bond-

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ing was captured in a 1951 *Better Homes and Gardens* illustration of a neat workshop, with a man handing a wood plane to an attentive boy. Cartoons showed a woman bringing a broken lamp to a man's worktable, interrupting his model-ship building (*Better Homes and Gardens* 1951). The scenario of wives nagging husbands to complete weekend "honey-do" lists became a pop culture staple, appearing in comics in which Blondie drags Dagwood off the couch to fix a dripping faucet (Young and Marshall 2007). Children's literature reinforced the male gendering of repair, as in a book featuring various tools, which ended by showing a boy watching a man hammer, above a caption, "It is my father's toolbox" (Ann and Harlow Rockwell 1971). Corporate publicity branded hardware as a naturally masculine domain, with male staff attending to male tool shoppers. For years, Ace Hardware stores employed the slogan "Ace is the place with the helpful hardware man." The 2002 edition of Merriam-Webster's *Third New International Dictionary* encapsulated masculinity in its characterization of manual skill, giving a usage sample for *handy* that reads, "clever in using the hands, especially in a variety of convenient ways (a man who is [handy] about the house)."

Advice manuals from the 1950s encouraged amateur handymen to claim territory for tools in attics, basements, or garage retreats, masculine enclaves inside the house, a space run by women. Well before the 1900s, the "cult of true womanhood" attached symbolic weight to the home as idealized "woman's sphere," valorizing virtuous domesticity in sermons and sentimental novels (Cott 1997). Yet correct homemaking performance seemed to demand more than just industriousness, experience, and instinct. Nineteenth-century domestic advice manuals, such as those by Lydia Maria Child and Catharine Beecher, coached women to complete specific chores, sometimes in extensive detail. Beecher noted, "Care of lamps requires so much attention . . . that many ladies choose to do this work themselves, rather than trust it to domestics. . . . Take the lamp to pieces . . . once a month." Beecher listed tools women would need to clean lamps, from sharp scissors to a spouted can (1848, 282). This specific assignment of a task to housewives was unusual; Beecher and other 1800s writers generally couched procedures in the passive voice, making the actual agent of work vague. Beecher recommended hanging nails over the kitchen sink to hold dishcloths, but never specified who should drive in the nails, whether the housewife herself; a husband, brother, or other family member; a female kitchen maid; or a male hired hand.

PRE-1950S NICHEs FOR WOMEN'S TOOL USE

Gendered assignment of household tool use grew clearer starting in the 1920s, thanks to the expansion of professional home economics. Especially at land grant colleges, where engineering departments trained men for industry and shop culture, home ec established its own gendered technical expertise in forms defined by and for women. Textbooks predicted that twentieth-century homes would be increasingly characterized by new mechanical systems, whose proper use would require women to add the values of efficiency and technical awareness to the older virtues of frugality, diligence, and domestic selflessness. As modernization transformed living conditions for all but the poorest families, faculty sought to make coeds worthy purchasers of refrigerators and washers. In 1929, Iowa State College created the first program in household equipment, graduating more than three hundred majors in twenty-five years (Bix 2002). Purdue, Minnesota, Washington, Ohio, and other schools soon also instituted equipment courses, aiming to create self-reliant homemakers who could confidently accept responsibility for new appliances and not fall prey to unscrupulous repairmen. Expressing this philosophy, one later text asked, "Are you plagued . . . by frequent breakdown? The homemaker who wants to 'run her home' rather than 'be run by it' needs an understanding of her tools and equipment so she can make them serve her" (Beveridge 1968, 7).

Required courses in equipment mechanics embedded hands-on tool experience within culturally accepted boundaries of female interest. Students were not only allowed, but expected, to pick up wrenches, dismantling and reassembling refrigerators to evaluate construction quality. In "electrical lab," women wired demonstration boards, assembled lamps, and repaired cords, following step-by-step diagrams. Taking apart faucets, women "mark[ed] with red ink the parts that are . . . replaceable" and made lists of the necessary tools (Van Zante 1964, 179). A 1931 story, written by and for home ec majors, suggests that at least some embraced this self-image as domestic engineers, coping without handymen or husbands. Confronting a malfunctioning stove, a young graduate panicked, then "remembered her husband laughing . . . about the woman who called for an electrician to put in a fuse." She successfully replaced the fuse, but one of the burners still would not heat.

Of course this was a man's job, but could she wait until an electrician came? She needed to use every unit. Well, she had learned

something about it in college, so she pulled out the unit. A wire had come loose. Disconnecting the stove from the circuit, she diligently worked with the pliers. . . . So simple! Perhaps it wasn't really a man's job after all. . . . Her pride increased when her sister-in-law said, "I had to run out this noon and buy lunch. Our fuse was burned out. . . . Wouldn't it be nice if a woman could understand such matters?" "A housewife really must know all those things," our heroine answered, knowingly. (Carlson 1931, 5)

Equipment class gave women technical knowledge while segregating them from the men's world of professional engineering. While only a small portion of the nation's female population studied home equipment in college, the image of women as informed tool users trickled down to a wider audience. Girl Scouting portrayed technical competence as essential to keeping a house "attractive." Handbooks encouraged Scouts to inspect for spots needing minor fixes: "If your parents are willing, make these repairs . . . alone or with . . . friends." Girls should learn to shut off water, gas, and electricity. "Serious damage can be avoided by a mere turn of the wrist, but you would be surprised how few people know how." To earn Handywoman badges, with an emblem of crossed hammer and paintbrush, Scouts had to build a bookshelf or bench, repaint chairs, patch screens, make a chicken coop or rabbit hutch, and wallpaper a room (*Girl Scout Handbook* 1940, 311).

In the years before World War II, a number of home ec graduates found employment writing and editing popular women's magazines, through which they and other staff spread the gospel of female technical competence. "Every Woman Her Own Plumber" gave directions for unclogging drains and included the comment "I know of no easier, if slightly unpleasant, way to save a five-dollar bill." Photos of female hands applying a wrench announced that this skill belonged in a homemaker's repertoire (Bentley 1923, 82–83). Ingenious women found their own strategies for developing technical knowledge. One woman recalled her mother installing a gas line, then reporting smelling a leak. Inspectors checked and declared everything fine, confirming her mother's success.

Beyond plumbing, electrification posed the biggest technical challenge for middle-class women. In 1910, only 14 percent of U.S. homes had electricity, a novelty of conspicuous consumption for elites, but by 1920, more than one-third had wiring installed. Utilities annually added 2 million residential customers, until by 1929, 70 percent of households were electri-

fied (Nye 1990). General Electric, Westinghouse, and small manufacturers blanketed potential buyers with ads for electric ranges, refrigerators, irons, heaters, toasters, roasters, grills, vacuum cleaners, percolators, waffle irons, heating pads, washing machines, and food mixers. Promoters promised that innovations would eliminate drudgery and give women hours of leisure (Cowan 1983). Each new appliance, however, imposed new cleaning, fixing, and maintenance obligations. *Good Housekeeping* ran a series on how to lubricate equipment, announcing, "With a little practise [*sic*] it is easy for anyone to repair" frayed cords. To make clear that "anyone" included wives, illustrations showed women connecting wires. Since primitive electric systems were easily overloaded, experts advised women to "familiarize yourself . . . [with] replacing the fuse or restoring the circuit-breaker switch, as this may save your calling in an electrician" (Maddocks 1922, 64). Bemoaning "haziness in the minds of many housekeepers on the subject of fuses," *Good Housekeeping* specified just where to find a fuse box. Given the risks posed by early wiring, the Good Housekeeping Institute urged readers to lobby insurance companies and municipalities to require designs in which "absolute safety is guaranteed to the person who changes a fuse, thus making it safe for women to do this" ("Why the Fuse?" 1922, 69).

Of course, readers were free to skip the technicalities of wiring; advice represented a counseled ideal for consideration, rather than mandates imposed from above. But even women who glanced at such articles, without any intent to perform repairs themselves, might absorb the moral that homemakers should consider undertaking electric work. Other publications, such as *American Home*, encouraged women's technical self-reliance, reinforcing a similar aspirational message. Moreover, even women too intimidated to handle fuses might pick up tools to refinish furniture, a genteel opportunity to gain DIY (do-it-yourself) skills. Guardians of taste, women were credited with a sense of beauty that validated tackling chairs with a scraper held at "forty-five to sixty degrees." Precise instructions made sandpapering seem as straightforward as following a cake recipe, while positioning tool use as an outcome of feminine interest in decor (Eberlein 1920, 22). The inexperienced but undaunted woman who transformed a dark kitchen by redoing woodwork did not hire herself out to paint alongside men, but earned praise within a context of domesticity (Robinson 1923, 80).

While painting fell within the female purview, heavy tasks remained the province of men before World War II. *Good Housekeeping* told wives, "If you have secretly longed for a gate or trellis, but can see no way to stretch

the family budget to pay a carpenter, why not get your husband to do the work?" Sketches showed a man sawing, "aided and abetted" by a woman, gingerly steadying the plank ("Ask Your Husband" 1940, 136–137). Many women, of course, were pleased to delegate. When one asked if she might expect her husband to fix a stuck garage door, experts reassured her that "any man should be able to manage it," implying that technical magic came naturally to all males ("Master Mechanic" 1940, 206).

World War II offered temporary justification for women taking on typically male tasks. An estimated 2 million women entered defense plants, drawn by public relations campaigns and relatively high pay. Newspapers, films, ads, business executives, and government propaganda praised Rosie the Riveter's efficiency in running lathes and drill presses. Rhetoric urged "smart and patriotic" women to "get out your . . . hammer" at home as well. Reupholstering chairs could "conserve and yet bring a refreshing gaiety to . . . keep up your family's morale!" (Draper 1943, 127). Wartime made technical independence a national virtue: "Because manpower is at a premium, it's up to you to be your own handyman when little jobs pop up. . . . Don't call for service unless you need repairs to appliances . . . which should be left to the trained repairman" (Henderson 1943, 100). Photos showing beautifully dressed women gracefully tacking down weather-stripping reassured observers that women who fixed windows remained attractive.

Women's journals trumpeted women's ability to combine tool skill and artistry. Urging readers to "copy" a "clever woman" who built her own fancy closet, *Good Housekeeping* raved about her putting wood, hinges, paint, poles, and hooks "all together her very own self." Photos of this ingenious amateur in a full ruffled skirt highlighted her femininity (Draper 1942, 65). A feature on a woman who reshaped crates into a baby sled (complete with ornamental curlicues) placed tool use within maternal devotion, as an all-American creative response to war exigency: "Our new son needed a sled, and as his Daddy was busy in Uncle Sam's Army, it was up to Mother." The magazine encouraged readers to draw on "simple inventiveness . . . [to] find an unused . . . box and make some child happy this Christmas" ("She Made it Herself" 1945, 43).

TRANSITIONS AND TENSIONS IN POSTWAR WOMEN'S TOOL USE

When peace arrived, experts occasionally still encouraged women's tool use. In the 1947 "You Can Fix It Yourself, Sometimes," *Good Housekeeping* made clear the "you" was female—even feminine. Photos showed a woman,

wearing a pastel yellow sweater and red lipstick, using a screwdriver. The publication told women to get their own tool kits, since “most homes have two kinds of tools—those the man of the house guards jealously and those that aren’t adequate. . . . Learn to do yourself those stitch-in-time jobs that avert accident,” like “open[ing] a stopped sink . . . the million-and-one things every homemaker ought to know.” An opening “Enigma” commented:

How women today—
Wives, sisters, and nieces—
Can knit or crochet
Such intricate pieces,
Yet be so dumb
With a hammer or pliers,
Leaves me numb
With amazement, sires! (Kendall 1947,404)

Reflecting renewal of traditional gender divisions, however, explicit technical encouragement for postwar women soon grew scarce. A 1956 list, “A Tool Kit of Your Own,” no longer treated “your” as female. Photos from 1947 had manicured fingers installing faucets; those of 1956 showed male hands (*Good Housekeeping* 1956, 291). Occasional talk about work that was easy enough even for women only reinforced gender expectations. Designs for “barbecues you can build” did make “you” female, drawing an analogy: “If you can ice a cake, you can lay bricks!” Locating women’s minds in the kitchen, the article gave a recipe for mixing mortar: “One part cement to two parts sand, enough water to make a ‘batter.’” The magazine immediately added, “If you’re all thumbs, by all means beseech, shanghai, or just plain hire a man to build one for you” (“Twelve Barbecues” 1950, 80).

Suburbanization added weight to masculine associations of tool use; as Levittown spread home ownership to a larger demographic, “Dad the handyman” gained new opportunities and obligations to assume command of a home’s physical soundness. Undertaking “projects became a requirement of masculinity. Do-it-yourself was becoming for adult males what sports were for youths, a virtual badge of manhood” in the 1950s (Gelber 2000, 85). Women were shunted to the sidelines, as men’s assistants or mere observers. Photos with one how-to piece showed a man busy painting, while a woman gazed into space; crossed arms underscored her dispensability. Her contribution apparently consisted of washing windowsills or steadying his ladder. Implying that femininity actually distracted from work, other pic-

tures showed the flirtatious woman toying with the man's hair and caressing his shoulder while he concentrated on reading paint labels ("*Anybody Can Paint*" 1952). Photos of outdoor maintenance showed women leaning on rakes or lounging on the grass while men dug out the septic tank or patched walks ("First-Aids" 1952).

Reflecting shifting expectations, 1967 tips on "things Mrs. Fix-It can fix" called for nothing more complex than a hammer. Rather than pick up real tools, women were told to improvise, using nail polish as emergency glue. Prewar magazines treated maintenance as wives' obligation in modern homes; 1967 made it optional, "for the gal who likes to repair all the things she can without bothering her husband, especially if he doesn't have a lot of free time." Women were cautioned not to tackle serious trouble: "If a faulty shower-head goes berserk . . . cut out the center of a plastic bowl cover [to] . . . divert the spurting water until you can have the plumber or your husband take over." Reserving heroic saves for masters, women might do minor chores as a favor to busy men: "If Mrs. Housewife hangs a picture, paints the hall closet, sharpens the wall can-opener, and fixes that bathroom door that has been sticking—all in one day—her husband may be so delighted and surprised that he will take her out to dinner" (Laird 1967, 54–56).

Significantly, college home economics departments continued to offer a wide range of classes that taught repair skills and technical knowledge to future homemakers, even during the post–World War II deference to gender convention. The link to science remained intense; Iowa State equipment majors took eighteen hours of physics, plus nine hours worth of classes in equipment mechanics, a two-hour equipment studies seminar, and a three-hour course on gas and electric cooking mechanics. Faculty member Louise Peet observed in 1958, "The complexities of lighting, plumbing, and heating once were considered too difficult for the feminine mind. Today's young homemaker finds it useful to have a working knowledge of these and other technical subjects such as electricity, gas, thermostats, insulation" (Peet 1958, viii).

In 1970s junior high and high schools, second-wave feminists' demands for educational equity called attention to gendered tool conditioning. National vocational training, originating with the 1917 Smith-Hughes Act, had for years channeled girls into home ec and secretarial classes. In 1962, boys constituted more than 97 percent of industrial arts enrollment (Dugger 1981). Title IX of the Education Amendments of 1972 drew attention to vocational gender bias, and the Education Amendments of 1976 specified remedial measures that states should take. Progressive districts such as in some

Chicago suburbs altered curricula to require girls to take shop (and boys home ec). Targeted programs claimed some success; with a two-person staff, North Carolina's New Pioneers Project induced almost seven hundred girls to volunteer to join trade class (Smith 1977). Women's studies advocates held "consciousness-raising workshops" for industrial arts teachers, while education experts pressed them to use gender-neutral pronouns and avoid saying, "She's a pretty good carpenter for a girl" (McLure 1977). When publishers proved slow to introduce nonstereotyped material, one shop instructor announced that he would glue photocopied illustrations of female mechanics into each book. For proponents of change, giving girls access to jigsaws and power sanders fostered a broad agenda of helping children recognize discrimination in education.

Ultimately, this effort did little to sustain a technical focus for girls. Federal grants were insufficient, while many administrators, teachers, and parents remained dubious about coed shop (Burbridge 1992). Critics complained that girls would distract and displace qualified boys who could actually put training to good purpose. Clinging to safely conservative norms, family, female cohorts, and boyfriends discouraged girls from expressing interest. Men filled 96 percent of full-time industrial instruction positions in 1979, creating an unmistakable dearth of female role models ("Sex and Racial/Ethnic Characteristics" 1982). In 2002, high school welding, auto mechanics, plumbing, electrical, and carpentry courses remained at least 92 percent male (Schemo 2002).

In the 1970s, such trends concerned female faculty at the Massachusetts Institute of Technology, who feared that unfamiliarity with tool use contributed to women's underrepresentation in technical professions. Engineering had been perceived and portrayed for decades as a masculine domain, linking men to technical ability and women to technical ignorance (Oldenziel 2004). Anxious to build a critical mass of female engineering majors, Mildred Dresselhaus created a freshman seminar titled "What Is Engineering?" MIT's class aimed to make girls comfortable with tools, compensating for the likelihood that most had less chance than did boys to tinker while growing up. In lab, students assembled radio sets to practice welding, soldering, and electronics (Bix 2000).

"Free to be you and me" pop culture facilitated small attempts to break children's gender-identity barriers. The Lollipop Power collective published *In Christina's Toolbox*, featuring an African American girl who "felt so good when she could . . . build." Linking skills to independence and fun, illustra-

tions showed Christina fixing her bike and making stilts “to march clackety-clack down the sidewalk.” The book portrayed tool ownership as a natural habit of women, with Christina storing her shiny toolbox next to her mom’s large one (Homan 1981, 4, 10).

In books aimed at adult women from this era, ambivalence about female tool mastery lurked behind advice to “overcome conditioning to . . . switch your mind off at the unladylike suggestion [to] use a screwdriver.” A 1978 book wryly told women, “If you ask for [drills] as a gift, you’ll probably get some Chanel No. 5 as well, out of sheer pity.” Undermining her own law that “a superwoman would prefer to be self-sufficient,” the author told the “lucky” woman with gallant help to “feed him well. If your man is unwilling, do not force him by . . . a reproachful glance as you hammer your thumb or [by] a list of what your friends’ husbands do for *them*. . . . You don’t want to find yourself patching up a marriage” (Conran 1978, 129–142).

FEMALE HOMEOWNERS’ POST-1990 EMPOWERMENT

Since the 1920s, material explaining equipment to women assumed that listeners were primarily current or future housewives, whose husband bought their home and who wanted to avoid nagging him or incurring professional repair bills. A flood of 1990s books took a radically different angle, promoting technical knowledge to women as homeowners themselves, eager to raise the worth of their investment. This philosophy was no accident; in the 1990s, the United States’ fastest real estate growth came from female buyers. By 2006, single women accounted for 22 percent of sales, and *Glamour* magazine urged potential purchasers not to wait for Prince Charming. Growing ranks of widows or divorcees living alone or in all-female households filled out the target audience.

Women writing new repair guides positioned themselves as coming from the same category as their readers, women with no previous technical experience beyond changing lightbulbs, forced to learn in men’s absence. *Dare to Repair*’s Julie Sussman and Stephanie Glakas-Tenet, wife of the then–CIA director George Tenet, “taught themselves . . . because their busy husbands were hardly ever home” (Sussman and Glakas-Tenet 2002, back cover). Several authors cited divorce as a catalyst; Beverly DeJulio, a mother of four facing a broken sump pump, “realized there was no shoulder to cry on. . . . The only person who was going to fix that pump was me” (DeJulio 1999, 2). Allegra Bennett, “blissfully ignorant of the mysteries of home repair” during marriage, had to cope with an overflowing waste disposal. To

unblock the drain, she "whacked about four inches off" a dishwasher hose, and her disposal worked "for the first time in two years. . . . I was the maven of the universe. I'd finally achieved appliance peace." When her ex admitted he had never understood that hose, she had a "liberating . . . epiphany of pivotal proportions" that men's technical superiority was mere "bluff." With this "crystal moment that changed me forever," Bennett began writing her "Renovating Woman" columns, which grew into a magazine, website, and radio and TV spots (Bennett 1997, xi–xii).

Bennett's revelation illustrated a frequent moral that common sense could help resolve technical problems. Janice Papolos, renter turned "virgin-homeowner," advised readers to fall asleep thinking about her cutaway drawing of a toilet: "See if you don't awaken with perfect clarity" (Papolos 1997, 63). To demystify unfamiliar technology, female writers posed user-friendly parallels: "Think of a water heater as an oversized coffee thermos with a heater—it's really not much more complicated" (Pastor 2005, 224). Even women who had never been inside a hardware store possessed useful tool knowledge, such as that "carpet-seam irons work like curling-irons" (Hemmis 2006, 98). Advocates further reassured novices that personal strength compensated for lack of manual experience: "Remember that women have in abundance what only a few men possess—finesse and patience" (Bennett 1997, 75). The sine qua non was readiness to overcome feminine fear of technical unknowns. Authors admitted that they too once worried about electrocuting themselves. Women paralyzed by general fear of failure, *Dare to Repair* recommended, should keep journals to remind themselves of their successes. Repair work provided opportunities for victory over adversity, just like nursing offspring over chickenpox or negotiating a raise: "If you start to panic . . . take a deep breath, and *get over yourself!*" (Sussman and Glakas-Tenet 2002, 2).

Like earlier women's magazines and equipment classes, women's repair books started with thorough information on basic tasks such as unclogging drains. But expanding visions of female technical capacity, 1990s authors encouraged readers to undertake more challenging tasks such as laying tile, replacing windows, installing dead bolts, hanging ceiling fans, mitering baseboards, and jacking up a whole house to reinforce sagging joists. Beyond a common format, writing styles varied. *The Woman's Fix-It Book* and *The Woman's Hands-on Home Repair Guide* gave instructions with little embellishment (Dustman 1998; Herrick 1997). Straightforward books still had an agenda, to redress gender imbalances in manual knowledge. In conscious

contrast to guides written for men assumed to have grown up handling tools, woman-oriented books began from scratch. *Renovating Woman* advised, “Just holding a five-pound vibrating saw in your hands for the first time can be unsettling. . . . Take your time and get acquainted . . . the way you . . . should . . . that new man you want in your life.” (Bennett 1997). Such books won praise on Amazon.com from grateful male readers, who looked past a female target demographic and appreciated getting comprehensible advice.

Chatty authors introduced technical detail with anecdotes of do-it-yourself valor. *Dare to Repair* told of a single mother unable to afford gutter repair and didn’t even have any girlfriends who “had ever been on a ladder, let alone a roof. As Olivia was climbing up, her neighbors were yelling for her to stop her nonsense and get down. But when she held up the cause of the leak, an overthrown newspaper . . . they shouted, ‘You go, girl!’ Olivia’s . . . gutters are still going strong” (Sussman and Glakas-Tenet, 2002, 72). To enliven dry advice on hanging mirrors, authors made seemingly obligatory cracks about terms such as “stud finder.” In a so-called R-rated repair guide, Hollywood businesswomen Joan Sittenfield and Jeni Munn spiced up solid information with sexual asides and puns about “ball cocks,” “screws,” and the faucet washers called “pro-hookers.” The chapter on VCR wiring was headed “Oh, Just Stick It In, Already!” The plumbing section featured a drawing of a woman with both hands wrapped around a giant pipe hanging just down to her open crotch. In a man’s magazine, this crude illustration would appear exploitative, but here it was intended to signify that women had the power to joke about tools (Sittenfield and Munn 1997, 231).

Homeowners themselves, female repair authors anthropomorphized buildings as having not just physical, but also emotional needs: “Some houses are like petulant lovers who stockpile their resentments, eventually releasing them in one explosive tirade” (Bennett 1997, xiv). Papolos, nicknaming herself “She Who Walks With Wrench,” said, “Everything that could go wrong did. . . . I viewed the house as pitting itself against me . . . downright vindictive . . . [but once] you get to know the house; it gets to know you” (Papolos 1997, 12, 397–409). Authors prompted owners to explore, reminiscent of the way 1970s feminist health collectives urged women to inspect and love their private parts: “For the heck of it, turn off the electrical power and remove a wall switch and a plug-in receptacle to see what it looks like. . . . Take a practice run disconnecting and reconnecting these. . . . Familiarity is 80% of success.” Just learning the right terms could protect homeowners; authors advised women to avoid babbling about “thing-a-ma-bobs” when hiring subcon-

tractors. Dealing with men on construction projects meant psychological gender war, in which ignorance and accommodation created vulnerability: "A woman's natural tendency toward cooperation . . . feeds the schemes of the home-repair predators." Strategically deploying men's own tool-related jargon, women could assume technical authority (Bennett 1997, xiv, 46).

Beyond language piracy, guides urged women to revel in transgression by donning gear typically worn by men in the boys' club: "Some women report that strapping a utility belt around their waists gives them a stimulating flush in their cheeks not unlike slipping on naughty apparel" (Bennett 1997, 26). Women who requested wrenches as Mother's Day presents defied gender convention, and authors portrayed technical independence as a new frontier of feminist progress. *Dare to Repair* began, "Women have stood on the floor of the Senate, rocketed into space, and climbed up corporate ladders. We've broken through glass ceilings—we just never learned how to fix them! . . . Dare to raise the bar for what you can accomplish. Dare to level the washing machine that's been rockin' and rollin' for months" (Sussman and Glakas-Tenet 2002, 1–3).

Women's repair advocates embraced personal, not political, feminism. While *Our Bodies, Ourselves* had engineered a movement to confront medical insensitivity to female health needs, the *Dare to Repair* genre never demanded that schools teach girls shop or that construction firms hire more women. Books did challenge gender norms, declaring not only that women were able but also that men were not all manually gifted. When a woman unclogged a drain in front of useless male roommates, *Dare to Repair* said, a "new pecking order was immediately established among the roosters—the chick was in charge" (Sussman and Glakas-Tenet 2002, 44). By gaining tool self-sufficiency, individual women made a statement: "To just call some professional to come in would have solved our immediate problems, but it would also have confirmed . . . [our] inabilities. As we changed our homes, they in turn changed us. As each fear was conquered, we learned to . . . disbelieve other fears . . . in our personal lives and at work" (Baker and Jarrin 2006, 1–2). Repair brought individual enlightenment: "Restoring a wall . . . has mending properties . . . beyond the obvious . . . therapeutic time-outs from that which is not so easily patched over—a demanding family, a challenging career, a rocky romance, financial hurdles. . . . The solitary task of repairing a crack in the Sheetrock or stilling a drip in a faucet provides quiet time for healing the cracks and stilling the drips that vex [women's] psyche" (Bennett 1997, xv).

Women's repair guides of the 1990s touted tool use as inspiring female confidence, but otherwise treated tasks such as unclogging drains as nuisances, a necessary evil to make homes function. Post-2000 books, on the other hand, portrayed women's manual skill as not only important but also enjoyable. Using visual humor to highlight fun, Discovery Home Channel's "Toolbelt Diva" Norma Vally, an ex-lingerie model, posed for the back cover photo of her *Chix Can Fix*, pairing a gorgeous evening gown with work boots, cradling a wrench as though it were Miss America's scepter. Authors promoted repair with a tone of hip third-wave feminism: "The more knowledge you have, the more power. . . . I want you to be able to walk into any hardware store . . . and know what you are talking about. All you need to know is *don't be afraid*. . . . Who says girls can't be tough? And why not be cute at the same time?" (Hemmis 2006, 5, 11). A desire to appear sexy sometimes overrode safety; authors shown drilling walls without wearing goggles or with loose hair violated their own stern precautions. Contradicting validations of feminist independence and norming heterosexuality, authors linked tool use to man-hunting: "Hardware stores can be very intimidating . . . filled with lots of men wearing tight T-shirts. . . . Wait a second, these are places you've been avoiding?" (Sittenfield and Munn 1997, 41). Project centers were "a fun house of bulging biceps" (Bennett 1997, 231). Authors reassured women that the dynamics of repair role reversal did not end romance: "The vast majority of men totally dig women taking charge of the responsibilities that gender bias has put on them for centuries [as] a huge relief. Plus, they think . . . women and power tools . . . that's *hot*," Vally said. "If my ability to use a circular saw is a blow to his ego . . . he's a loser" (Vally 2006, 199).

Even as advocates promoted the sex-appeal of amateur tool use, conditions remained extremely hard for women in blue-collar employment. In 1978, President Jimmy Carter set affirmative action targets for federal contractors. Labor Department timetables to raise female apprenticeships to about 25 percent spurred nominal recruitment, but in the Reagan era change stalled, with lax enforcement by underfunded departments (Eisenberg 2004). Women trying to crack the power imbalance of a macho work culture encountered vicious denigration; often supervisors isolated women, withheld vital information, or allowed pornography and sabotage to become weapons at the job site. Women who finally won acceptance in construction voiced pleasure in pointing to "my" bridge. One said, "I loved bending pipe, pulling wires. . . . But they took the heart out of me" (Eisenberg 1998, 193). In 2008, Cincinnati tradeswomen voiced their frustrations with poor sanitary

facilities, failed appeals for promotion, and unstable employment that disrupted child care (Dabke et al. 2008). At the 1999 peak, women composed just 2.6 percent of workers in carpentry, electricals, plumbing, roofing, and the other six biggest construction trades. Women's representation in apprenticeship programs plunged from almost 5 percent in 1993 to just 2.5 percent in 2003 (Berik and Bilginsoy 2006).

A few skilled women found more pleasant careers by reinventing themselves as repair celebrities. Cable television filled hours with renovation shows, reflecting escapism and Martha Stewart obsession during a post-9/11 "cocooning" craze. Female stars added appeal, favorites for dedicated viewers. After learning carpentry in a Bronx union and working on the World Trade Center, Lynda Lyday's comedy club moonlighting led her to the Home and Garden Television Network and the DIY Network (Lyday 2005). Amy Wynn Pastor, featured carpenter on *Trading Spaces* was a theater major until backstage classes lured her into Broadway construction. Self-taught worker Paige Hemmis landed a regular spot on *Extreme Makeover: Home Edition*, while "Handy Ma'am" DeJulio and her two daughters appeared on Discovery's *Easy Does It* and on HGTV and PBS.

Entrepreneurs built stardom by appearing on *Oprah* and morning television, then leveraging brand identity into commercial ventures. Hemmis founded Tuff Chix, Incorporated, selling work boots designed for women. Barbara Kavovit opened first a multimillion-dollar construction firm, then "a lifestyle company" for DIY women. Calling tools "accessories as important as a pair of fabulous shoes," Kavovit designed a translucent blue tool kit and sold more than five million dollars' worth in 2004. A Swarovski crystal-covered limited edition, given to 2005 best-actress Oscar nominees, sold on the Barbara K! website for \$2,495. Kavovit's DIY book scored blurbs from the duchess of York and Vanessa Williams, whose endorsement read, "I frequently do minor repairs . . . believe it or not, and having the barbara k! cordless drill . . . makes life much simpler" (Kavovit 2005, xiii, back cover).

Websites provided powerful recognition building for self-made repair celebrities such as Heidi Baker and Eden Jarrin, who launched a multimedia "home empowerment" business selling women work clothes, tools, repair books, and videos. In their online community, "Janes of all trades" shared excitement about tools' transformational magic. A Tennessee woman wrote, "If a scrawny girlie-girl with spaghetti arms can drive a roofing nail in with two hits, then anyone can . . . an adrenaline rush that nothing can compete with. Be fearless" (Baker and Jarrin 2006, 7–9). Enthusiasts exchanged suc-

cess stories and discussed whether pregnant women should stain floors. AOL and iVillage.com also soon added female-oriented home improvement websites, with a virtual encyclopedia of user-friendly technical advice accessible around the clock.

Feminism-lite remained a rhetorical standard for celebrity repair-women; bragging that a girl chose to dress like Amy the Carpenter for Halloween, Pastor said, “I just hope it helped her realize that she can be anything she puts her mind to” (Pastor 2005, 118). Vally promised that women with tool skills walked “with more poise. . . . Suddenly you’re no longer the victim. You have leverage to . . . chase that lifelong dream, get out of that toxic relationship, . . . take down the walls that confine” (Vally 2006, 201). Hemmis’s “homegirl” technical dictionary flippantly offered the following definitions: “Boyfriend: can be trained to carry out instructions . . . when you just need that extra little bit of muscle”; “Husband: excellent for holding a ladder” (Hemmis 2006, 285–287).

Soaring real estate let DIYers covet crown molding, hardwood floors, and track lighting. Appeals to women’s stereotyped love of shopping touted the thrill of combing antique stores for a “shiny Bakelite handle from the forties” (Sittenfield and Munn 1997, 93). Advocates urged women to throw themselves into remaking dull rooms as personalized nests: “You might be living in a house that just doesn’t make you happy. The good news is you can change that, and when you change your home, you change your life.” *Be Jane* promised that removing scars from dining-room panels would inspire more comfortable guests to sparkling conversation. Installing bedside dimmer switches could instantly fan “the fragile connection needed for romance” (Baker and Jarrin 2006, 1, 104). Self-indulgent women could convert bathrooms “from blah to spa in just a weekend” by replacing standard fixtures with massage showerheads. Women should approach such tasks not as a chore, Kavovit ordered, but as experiential revitalization: “Enjoy the process. Be mindful. . . . With every stroke of the brush . . . you are improving your room and your life” (Kavovit 2005, 35–37). Merging tool empowerment with democratic luxury, advocates told busy modern women they were entitled to relax on a plush headboard, even if they first had to build it.

After women began organizing home improvement seminars, Home Depot jumped in to cultivate this demographic, running free “do-it-yourself” workshops that in three years drew more than 275,000 participants. Lowe’s scheduled “Ladies’ Night” clinic opposite Monday night football. The trend reflected bottom-line business opportunism. After 2000, women constituted

half or more of nonprofessional customers at home centers, which welcomed them by widening aisles, lowering shelves, and adding brighter lights, improvements that also benefited male patrons (Valentine 2005). Ace Hardware rewrote its slogan as "The Helpful Place" and featured a web gallery of salespeople representing different genders and races. A Sears survey found that 61 percent of female homeowners reported enjoying maintenance and repair, 69 percent considered themselves handy, and 60 percent allegedly would rather consult with Bob Vila than with Dr. Phil (Chatzky 2004).

Undermining this rosy sensitivity, Home Depot paid more than \$100 million in 1997 to settle class action lawsuits charging a hostile environment for female employees. A former air force mechanic was confined to a cashier's post, as was a woman with eight years' lumber company experience, allegedly told, "Girls do not work in lumber" (Myerson 1997; "Employees" 1997). The most infamous bias suit dated back to 1979, when the Equal Employment Opportunity Commission targeted Sears for statistical disparities showing men monopolizing high-commission sales; Sears successfully defended itself, claiming that few women had an interest in working on lawnmowers or appliances (Williams 1992).

Nevertheless, distinct corporate shifts reinforced the acceptability of female skill. Home Depot copied the message of female tool empowerment, using emotion-oriented advertisements in which a "shy, new single mom, trying to make it" spoke about renovating her own home in honor of her late handyman father. Lowe's linked hardware to philanthropy, teaming with Habitat for Humanity to recruit female volunteers to construct houses for needy families. Between 1998 and 2008, Lowe's/Habitat "Women Build" programs completed twelve hundred homes across the United States and abroad; participants included then-first lady Hillary Clinton. Lowe's publicity featured photos of enthusiastic women in hard hats, holding hammers aloft triumphantly. The program created a sisterhood opportunity for manual novices to gain confidence; on-site work teamed first-timers with tradeswomen willing to share their knowledge.

Girl Scouting still encouraged girls to learn to unclog drains and build shelves, as part of the twenty-first century "Ms. Fix-It badge." To earn an engineering badge, Scouts had to take apart a clock, toaster, or hair drier; for "discovering technology," Scouts set up computers and sound systems. For "car care," girls had to check fluids, add oil, and put air in tires (*Junior Girl Scout Badge* 2001). Encouraging Scouts to interview a carpenter or plumber about her career, handbooks advised, "The best way to find out if a job is

right for you is to try it! Volunteer as an apprentice painter . . . [or] get a part-time job at a local hardware . . . store” (*Interest Projects* 1997, 35).

Press visibility validated female DIY interest. When a woman complained to Dear Abby about a husband who was slow to fix faucets, readers urged her to repair them herself (“Dear Abby” 2007). A 2008 Citibank ad, featuring a woman working under a car, attired in red stilettos and white jeans, read, “Just because I’m restoring my car, doesn’t mean I have to dress like a mechanic. As a little girl, I didn’t play with dolls. I played with carburetors. So when I found a beat-up old classic . . . [I] bought a new axle, an engine block . . . [plus] new heels. Because there’s no point fixing up your car if you can’t fix yourself up.” Even if most *Glamour* readers remained likely to buy shoes and not axles, the ad trusted that audiences would find women’s car care intriguing, not silly or offensive, especially if the woman stayed indulgently feminine (*Glamour* 2008).

Slurs on women’s repair capacity lingered. *Family Handyman* incorporated photos of women building tables or wiring audio systems, but sexism crept through in cartoons showing a woman stymied by lack of kitchen or garden space. She turned helplessly to a man, who instantly created planters and storage. The dynamic implied that wives dithered; husbands wielded tools (*Family Handyman* 2007). Tool design itself revealed persistent doubts about female technical ability. Catalogs and stores offered “ladies’ tool kits” containing flimsy hammers with floral-patterned handles, a patronizing inadequacy that infuriated serious DIYers. Fearing that specialty tools reinforced doubts about “the weaker sex,” some women insisted on using men’s tools. Others wanted strong but light equipment, ergonomically engineered for slighter frames. Some companies and female celebrities capitalized on this niche by designing clothes, tools, and work accessories suited to women’s bodies and perceived taste. Pastor served as spokesperson for AO Safety Select’s respirators that were sized to fit small faces and stylish multicolored safety glasses.

The biggest controversy centered around pink-colored tools, which revolted some skilled women and enticed others. Hemmis wore pink on television, saying she “had entered into a man’s world . . . [so] wanted to stand out as a strong and capable woman” (Hemmis 2006, 12). As happy owners noticed, pink tools were less likely to vanish into pockets of male “borrowers.” Other women scorned pink as an insulting sign of marginalization, and the women who founded Tomboy Tools in 2000 initially adopted the slogan “No Pink Tools.” Their Tupperware-style direct-marketing firm

recruited women to offer in-home “tool parties,” letting female customers test and acquire equipment in a nonthreatening atmosphere. In 2006, however, following customer requests, Tomboy reversed its policy, to create “pink-for-a-purpose” hammers. The company’s “Hammer Out Breast Cancer” campaign donated a share of profits from the sales of pink-handled power drills, screwdrivers, utility knives, and tool kits to Susan G. Komen for the Cure (“Tools for Women: Learn Today, Teach Tomorrow, Build Forever” 2008).

CONCLUSION

Twentieth-century American men generally did not need to justify an interest in picking up tools. While individual men might prove incompetent at manual work or choose not to perform it, society linked masculinity to tool use through shop class, job training, Boy Scouts, hobbies, and father-son apprenticeship. Women, on the other hand, had to assert rights to tool use, under the rationales of 1920s modernization, 1940s war need, and 1990s investment and empowerment. Inside the home, the traditional feminine sphere, women could stake a claim on male-dominated skill. Statistics of women’s tool use are difficult to quantify; we have no good method to discover how many replaced their own fuses in 1930. Yet the compelling cultural dialogue around women’s repair work shows tools as a site for negotiated performance of gender roles.

While men could win praise for keeping homes in good shape, such competence risked being taken for granted. Women’s repair work had to be promoted more actively and embedded in a more overtly emotionalized context. Philosopher Elizabeth Spelman argues that women have long played leading roles in home repair, as broadly defined, from mending clothes to physical, mental, and emotional caretaking. Nursing family members returns bodies to health; teaching children to recover from failure revives their self-confidence; patching up quarrels restores social harmony: “It’s not just cars or toilets or phone lines that . . . need fixing. We humans don’t just live in a world of breakables; we *are* breakables, our bodies and souls . . . subject to fracture.” Spelman writes, “If central to domestic masculinity is the repair of material objects and the passing down of lessons about such repair, central to domestic femininity is the repair of persons and relationships.” In focusing on nurturing as women’s repair service, Spelman slides into the trap of reclassifying hardware as male. She concludes, “Though not all men have been welcomed into or expected to aspire to join the brotherhood of tool users, women of all classes and complexions need not even apply” (Spelman 2002,

41, 49–50). A closer look demonstrates precisely the opposite; the twentieth century provided substantial room for women’s tool use.

Advocates promised women that tool mastery offered monetary savings, better living, the power of accomplishment, and independence. But to women already stretched thin by child care, elder needs, and paid employment, juggling extra expectations for DIY home maintenance could mean more stress. Repair books, cable shows, and websites encouraged women to pour extensive effort into fantasy renovation projects. Chasing the tempting goal of a perfected home, women might overlook alternative, less material paths to greater well-being. Celebrities such as the “Be Jane” group channeled women to rededicate themselves to the domestic landscape, as opposed to political involvement, social activism, or self-betterment opportunity. But when work, family, or public life proved frustrating, home improvement at least offered women control over something.

Female repair advocacy did not translate to revolutionizing the gender world of technical professions. Teaching Girl Scouts to use screwdrivers did not automatically move adult women into well-paid construction jobs. College equipment classes were too grounded inside home ec disciplines to allow students a natural path into engineering. Researchers have identified many factors contributing to women’s continued underrepresentation in engineering. Schools and educational organizations have created many programs to “sell” girls on the fun and rewards of math, science, and technology, yet the “leaky pipeline” of women dropping away in secondary school, college, or after graduation continues. Serious obstacles remain embedded inside daily practices of engineering, including “micro-discrimination,” lack of influential female role models, and the perpetual problem of career-motherhood balance (Rosser 2004; Bystydzienski and Bird 2006).

Through the twentieth century, every woman who picked up a hammer (pink or not) contributed to making a statement about the gender identity of tool use. Women’s rising patronage of hardware stores underlined the demise of the most rigid assumptions reserving manual expertise for men. But a common theme remained, that women required special encouragement to overcome inexperience and doubt, to begin building. In telling women to be confident, in sharing success stories, in promoting emotional rewards of tool use, *Dare to Repair* emphasized just how much boldness women had to exhibit in undertaking DIY work. The courage women still needed for tool use in 2008 underlines the contested gender of technical knowledge.

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