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Seabee Assignment Tradeoffs

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Seabee Assignment Tradeoffs

Diana Lien
With Anita Hattiangadi

We are grateful to the Seabee units listed in appendix A who gave generously of their time.

Tasking

- Phase 1: An assessment of Seabee compensation
  - Identified Seabee manning problems
  - Analyzed differences in compensation between Navy communities
  - Found that new Seabee pay may be warranted, given enhanced sea pay
- Phase 2: Provide additional information on creating a compensation package
  - Use stated preference data to quantify perceived arduousness of sea duty and deployments
  - Compare estimates with phase 1 sea pay "fix"
  - Examine homeport location preference

The Commander of Naval Facilities Engineering Command (NAVFAC) asked CNA to determine what type of compensation would target any existing or impending shortfalls in Seabee retention and manning. Currently, the Seabee community receives no sea pay and little deployment-related pay. In phase 1, CNA found that the recent policy that increases sea pay to seagoing personnel without providing a comparably sized amount to Seabees could worsen the Seabee community's relative standing. That study found that a $2.9- to $4.3-million-per-year compensation is justified, and it presented a variety of compensation options to address Seabee manning and retention concerns.[1]

This annotated briefing is phase 2 of the tasking. Our analysis reveals which aspects of sea duty are arduous and explains how compensation can be used to address manning and/or morale issues in the Seabee community. The analysis uses data from the *Seabee Quality-of-Service Compensation Survey*, which was designed to collect data on enlisted Seabees' preferences for aspects of sea duty assignments. By measuring these relative preferences, the analysis provides information on appropriate compensation levels to offset perceived arduous aspects of sea duty. We also look at homeport preferences to determine whether an assignment location-based incentive pay is appropriate for the Seabee community. In addition, this document discusses which sea duty changes influence enlisted Seabees' stated intentions to remain Seabees.

[1] Anita Hattiangadi, Henry Griffis, and David Gregory, *"Can Do No More?" An Assessment of Seabee Compensation,* May 2002 (CNA Research Memorandum D0005212.A1).

Issues

- What are Seabees' preferences for homeport and deployment locations?
  - Is a homeport incentive pay appropriate?
- What is the hardship associated with the current sea tour length?
- What is the perceived hardship of sea tour deployments?
  - What was gained by the recent deployment cycle change?
- Would changes to sea duty assignments affect stated retention intentions?

This annotated briefing answers the following four questions:

What is the tradeoff between homeport/deployment location and money? We discuss which homeport and deployment locations Seabees don't prefer and the level of pay that would affect their willingness to choose a sea duty package with a less preferred location attached. In the case of homeport, we discuss cases in which a location-based special pay may be appropriate. We also discuss the tradeoff between pay and deployed location.

What is the tradeoff between pay and sea tour length? This quantifies the perceived cost of different sea tour lengths.

What is the tradeoff between pay and deployment cycle? Analysis of the survey data provides information on the perceived cost to the Sailor of being deployed.

Would additional compensation result in increased retention? This analysis provides information on which sea tour characteristics affect Seabees' stay/leave decisions about the Seabees/Navy.

Summary of Findings

- Rota, Spain, is preferred to Guam, which is preferred to Okinawa, Japan
  - Differences in deployment location preferences exist but are not strong
- Sea duty deployments are arduous
  - A majority of the sample cited being away from family as the most arduous part of deployments
  - Results suggest perceived benefit from decreases in sea tour lengths due to decreases in deployed length
  - Significant perceived gain from shift to 6-10 rotation
    - Suggests that both deployment length and frequency matter

Looking at primary deployment location, we find that Rota is preferred to either Guam or Okinawa. Guam is preferred to Okinawa. Although the preference ranking is consistent for all subsamples, the level-of-preference difference between locations is not significant. While compensating Seabees for going to a less preferred primary deployment location, such as Okinawa, would most likely increase willingness to volunteer for those assignments, we don't find any indication that the location of deployment is the most arduous characteristic of deployments.

The results suggest that sea duty deployments are arduous, and that a large portion of the perceived benefit from a decrease in sea tour length is from the corresponding decreases in time spent deployed.

Summary of Findings (cont'd)

- Preference to have multiple sea tours at the same location
  - Strongest for
    - Seabees at Gulfport, MS, NMCB unit
    - Married Seabees
- Changes in sea duty assignment packages influence stated reenlistment intention

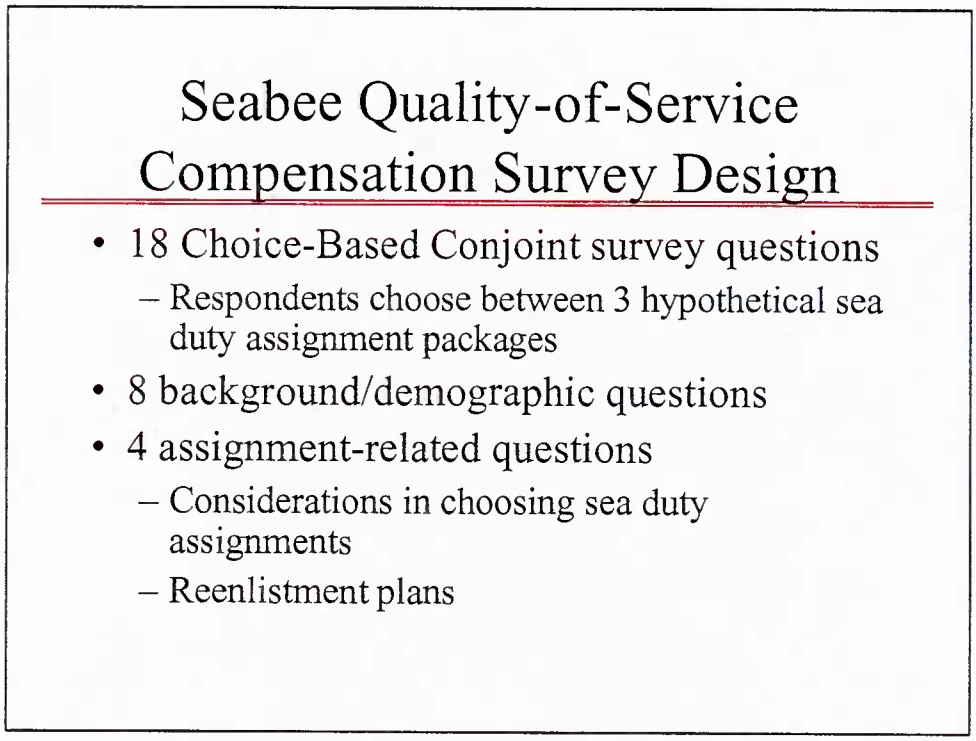
The recent Navy special pay, Assignment Incentive Pay, was developed to man less preferred locations. In the case of Seabee manning at Gulfport, MS, and Port Hueneme, CA, we find no indication that either location is particularly less preferred. Considering the preferences of Seabees currently at those locations, we find a preference to have multiple sea tours at the same location. This preference was particularly strong for married Seabees. Two ways to address this concern are compensating Seabees who switch locations or attempting to minimize moves through such a policy as homebasing.

We find that estimated reenlistment intention is affected by all of the sea duty characteristics examined; however, it is affected most by changes in special pay received.

Outline

- Survey description
- Considerations in assignment decision
- Choice-Based Conjoint (CBC) methodology
- Arduousness of sea duty and deployment
  - Sea tour lengths
  - Primary deployment locations
  - Deployment cycles
- Preferences and valuations of homeport locations
  - Implications for an Assignment Incentive Pay
- The impact of compensation or quality-of-service incentives on the decision to stay Navy

First, we describe the Seabee Quality-of-Service Compensation Survey. The survey description is followed by a summary of answers to survey questions about sea duty and the assignment process in general. We then briefly discuss how we estimated preferences for different sea duty characteristics and present the results of those estimates. Our analysis of Seabees' preferences for compensation versus other nonmonetary aspects of sea duty follows. Then, we analyze how sea duty compensation would influence the decision to stay in the Navy. We end with compensation options.



The data used in this analysis were collected with the Seabee Quality-of-Service Compensation Survey. The main section of the survey consisted of Choice-Based Conjoint (CBC) questions that explicitly asked enlisted Seabees to choose between different sea duty packages that included compensation and nonmonetary, quality-of-service characteristics. We employ this approach using stated-preference data for two reasons: (1) the survey questions mimic possible assignment choices that Seabee Sailors could face and (2) some of the sea tour assignment options currently don't exist. Because some of the sea tour assignment options don't exist, using historical data for analysis would not provide the necessary information.

The survey data do not reflect what actually occurred or will occur; they indicate Sailors' preferences for different aspects of sea tour assignments. For example, there is no guarantee that the estimated location preferences presented in this annotated briefing will equal actual or future manning shares at these locations. However, we are able to get an estimate of the relative preferences for different locations and compensation.

Along with the 18 CBC questions, we ask 12 questions in standard survey format. These questions address background demographics and reenlistment intention. Items included on the survey are in appendix B.

Data Sample

- Fielding
  - August and September 2002
  - Participating units
    - 19 CBUs, 7 NMCBs, 2 ACBs, 1 UCT, 2 NCTCs, and 2 NCRs
- Sample
  - 1,204 respondents completed surveys

The Seabee Quality-of-Service Compensation Survey was fielded over a 2-month period to all CBU, NMCB, ACB, UCT, NCTC, and NCR units. Respondents from 33 units participated. This analysis would not have been possible without the cooperation of the Seabee units listed in appendix A.

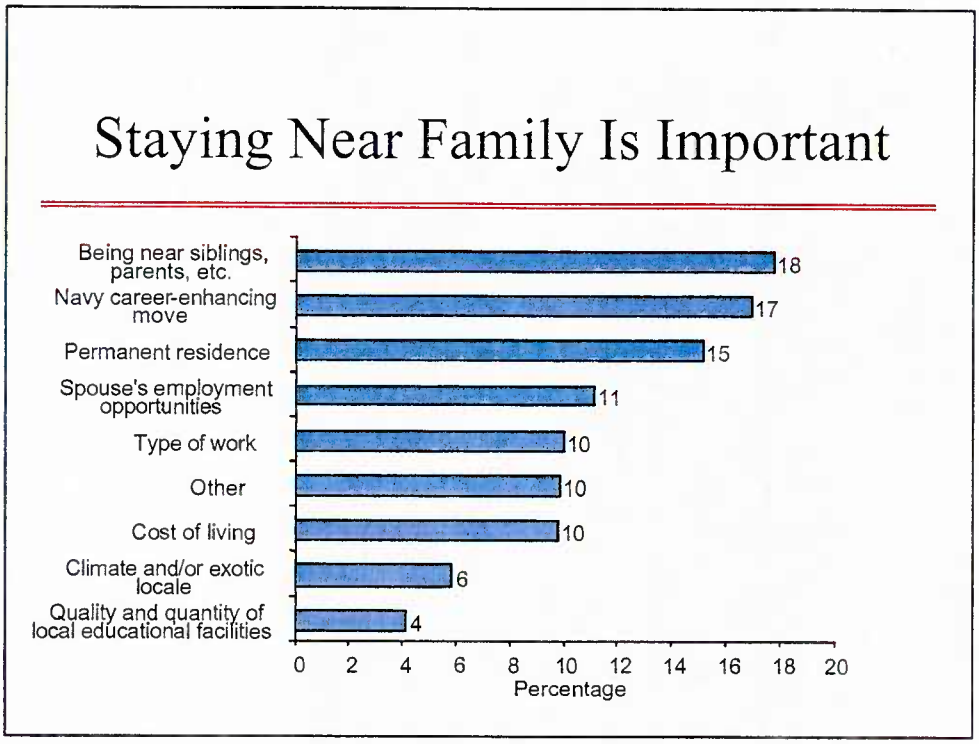
The sample used for analysis includes 1,204 observations. Of a total of 1,244 survey responses, 40 survey responses were not complete and not included in the analysis.

Survey Sample More Likely to Be Married and E-6 to E-9

Category:	Sample (%)	Population (%)
Married	59	47
E-1 to E-4	39	46
E-5	27	25
E-6 to E-9	34	29
NMCB Unit, Gulfport, MS	24	24
NMCB Unit, Port Hueneme	32	24
Other units and locations	44	53
Builder	28	28
Construction mechanic	15	17
Equipment operator	14	16
Construction electrician	12	14

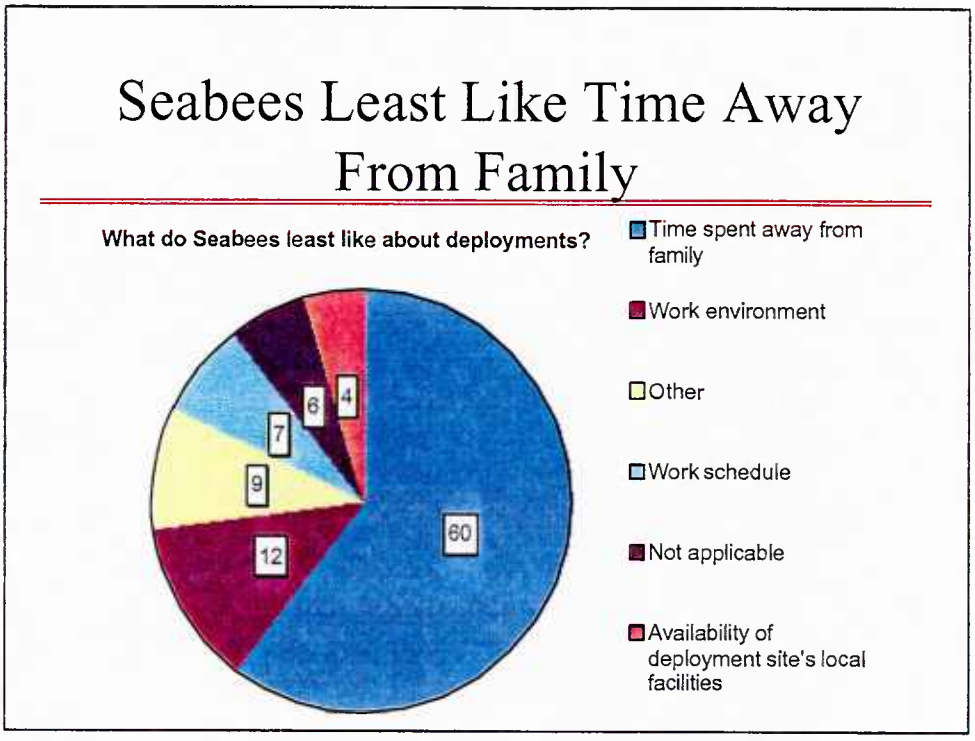
This slide compares the demographics of our sample to those of the entire Seabee population. The survey sample reflects the Seabee population distribution on several dimensions; in particular, the rating distribution for the largest Seabee ratings is very close to the population distribution across ratings. In terms of differences, the survey sample has a higher percentage of married Seabees than does the Seabee population. This correlates with the fact that the survey sample has a higher percentage of E-6 to E-9 Seabees.

A complete listing of survey statistics compared with the population is presented in appendix C.



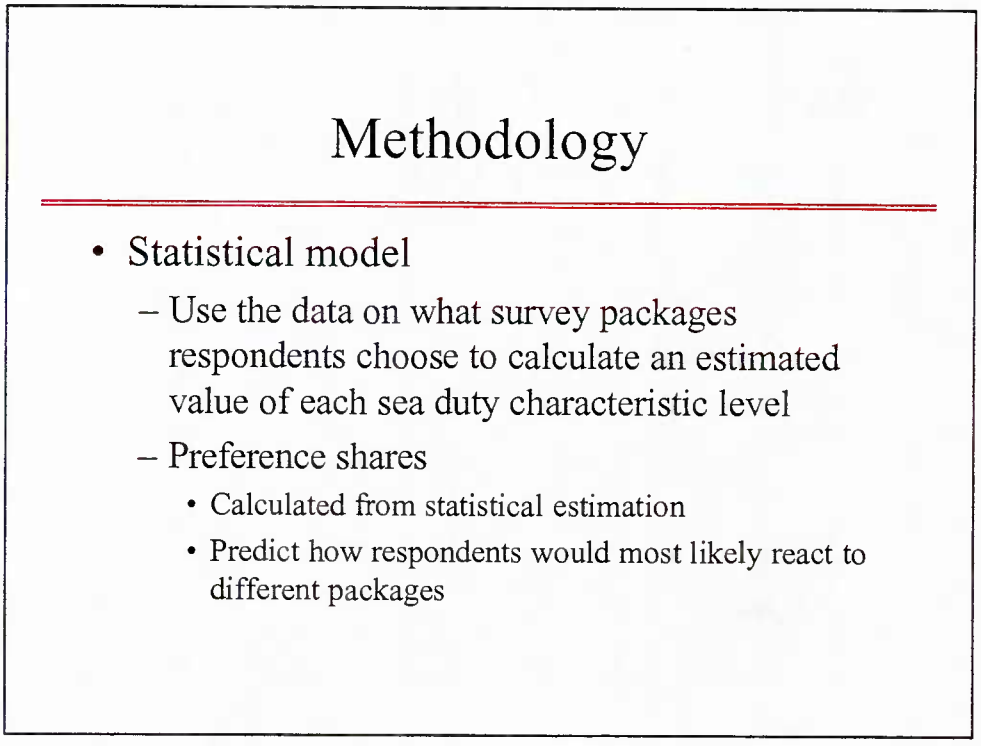
This slide shows respondents' most important considerations in the assignment decision process. Each respondent was asked, "In general, which of the following is most important to you in the assignment process?" and was provided with the above options. Respondents could only select one of the options. This gives an indication of what Seabees consider to be most influential in their decisions about assignments in general, not just sea duty assignments.

Being near family was the most often cited consideration in the assignment decision, followed by the assignment being a career-enhancing move, and having a permanent residence. Being near family, having a permanent residence, and spouse's employment opportunities all relate to geographic location, which is consistent with wanting to stay in the same location for more than one tour. We look at the respondents' preferences for repeat sea tours at the same location later on. Navy career-enhancing move and type of work deal with aspects of sea duty assignments that were not addressed in the survey.



This slides ranks the least liked deployment characteristics. Respondents were asked to choose an option in response to the question, "What do you least like about deployments?" Although the survey list was not exhaustive, it provides information on the negative characteristics of sea duty deployment.

A majority of respondents selected "time spent away from home and/or family" as the least liked characteristic of deployments. This shows that in general the primary drawback of deployments is being away from family, followed by the secondary concern of the deployment's work environment (facilities, tools, etc).



This slide briefly introduces the methodology used in estimating preferences for sea duty characteristics from CBC data. By repeatedly asking Sailors to choose between different assignments, we were able to make inferences about Sailors' preferences. The data tell us (1) which sea duty assignment characteristics Sailors prefer, and (2) how people make tradeoffs between the various levels of the different sea duty assignment characteristics.

The CBC data include information on the four packages respondents saw and which package was chosen. Not all potential packages are seen by all respondents, so we are interested in estimating the impact of the package levels on an estimated probability of a particular package being chosen. To estimate the value of the package levels, we use a conditional logit model. The conditional logit model included all package characteristics and two interactions: money with sea tour length, and homeport with deployment location. From the model, we estimated a perceived value of each package characteristic, which we used to estimate the probability that a hypothetical package would be chosen. This allows for the estimation of the probable preferences between package options not seen by all or any of the respondents. None of the data collected from the survey was linked to the individual respondents, so we are not able to compare our results with the type of assignment decisions respondents later made.

Appendix D provides a more thorough description of the methodology. Appendix E provides the estimates from the conditional logit model.

Example of a CBC Question

	Package 1	Package 2	Package 3	Package 4
Homeport	Gulfport, MS	Port Hueneme, CA	Port Hueneme, CA	None: I would prefer to either leave the Seabees or leave the Navy than serve a sea tour under these terms
Total extra special pay received during the sea tour	$2,000 extra special pay for the sea tour	$5,800 extra special pay for the sea tour	No extra special pay for the sea tour	
Change in expected sea tour length	12-month increase in expected sea tour length	No change in expected sea tour length	6-month increase in expected sea tour length	
Primary deployment location	Okinawa, Japan	Rota, Spain	Guam	
Deployment cycle	7 months deployed, 7 months in homeport	6 months deployed, 10 months in homeport	6 months deployed, 10 months in homeport	

This slide shows the type of CBC question respondents saw. Each survey included 18 CBC questions that asked respondents: "If offered only the following sea duty packages for your next sea duty assignment, which one would you choose?" Each respondent saw different package variations.

Several sea duty assignment characteristics were included to estimate the respondent's perceived cost or benefit of sea duty packages. Homeport was included to provide information about homeport preferences and to give an indication of the usefulness of an assignment incentive pay. Change in expected sea tour length, primary deployment location, and deployment cycle were included to provide information about the perceived arduousness of sea tours and deployments. The monetary incentive is a scale and provides suggestive evidence of what levels of compensation may be appropriate. This slide shows some of the assignment characteristic levels seen by respondents. Appendix B includes a table with all assignment characteristic levels.

Monthly Equivalent of Extra Special Pay Survey Item

Subsample	Equivalent amount per month of sea tour			Equivalent amount per month of deployment (6-10 cycle)		
	$2,000*	$3,200*	$5,800*	$2,000*	$3,200*	$5,800*
E-1 to E-4	$37	$59	$107	$83	$133	$242
E-5	$41	$67	$120	$111	$178	$322
E-6 to E-9	$56	$89	$161	$125	$200	$363

*The survey question special pay amounts

The compensation included on the survey was special pay received for the entire sea tour length. Any sea duty special pay would be received for the entire sea tour length, but it would most likely be received on a monthly basis. This table shows the monthly equivalent by rank category if the special pay were received each month of the sea tour or each month of deployment during the sea tour. The numbers for rank category differ based on average sea tour length. On average, E-1 through E-4 Seabees have a sea tour length of 54 months, E-5 Seabees have a 48-month sea tour length, and E-6 through E-9 Seabees have a 36-month sea tour length.

Because average sea tour length varies by paygrade, so does average months deployed within each sea tour. In calculating the average number of months spent deployed during the sea tour, we assumed that the first month of the sea tour was spent deployed and that the entire tour followed a rotation cycle of 6 months deployed and 10 months in homeport. Under these assumptions, E-1 to E-4 Seabees spend 24 months deployed, E-5 Seabees spend 18 months deployed, and E-6 through E-9 Seabees spend 15 months deployed.

What Is a Decrease in Sea Tour Length Worth?

	Package 1: 6 month decrease in sea tour length Package 2: Would have to have the following amount:
Full sample	$495
Married subsample	$325
Single subsample	$746
E-1 to E-4 subsample	$614
E-5 subsample	$617
E-6 to E-9 subsample	$340

These estimates are the amount of sea tour compensation attached to a normal sea tour length package that would make the "typical" respondent as likely to choose that package as one with a sea tour length 6 months shorter.

Using the methodology discussed on a previous slide and in appendix D, we examine how a decrease in a sea tour length is perceived. The CBC survey packages included the sea tour lengths of no change, a 6- or 12-month increase, and a 6-month decrease. An increase in sea tour length is a disincentive, so Seabees would be willing to give up money or have a decrease in pay in order to avoid either of those options. The survey did not include negative monetary numbers, so the monetary estimates associated with a 6- or 12-month increase are not precisely estimated and, therefore, are not presented.

Instead, we focus on the values of a 6-month decrease in sea tour length. We determine the amount of compensation that would make the "typical" respondent just as likely to choose either of two sea duty assignment packages: one with a sea tour length 6 months shorter and the other with current sea tour length plus some amount of sea tour compensation.

Of note are the estimates by rank category subsample. For E-1 to E-5 Seabees, the typical respondent would be just as likely to choose a sea duty assignment with a 6-month shorter tour as an assignment package worth about $600 for the entire tour. Although this does not translate into much sea tour pay per month ($11/month for E-1 to E-4 and $13/month for E-5), it is larger than for the E-6 to E-9 sample ($9/month). The estimates indicate that, holding all else constant, there is an arduousness aspect to sea tours, primarily deployments.

A 6-month decrease in sea tour length most likely would influence time spent deployed. For the 6-10 rotational cycle, if the first month is spent deployed, a sea tour decrease of 6 months will, on average, reduce deployments of E-1s to E-4s by one cycle (or 6 months). If the first 10 months of the sea tour are spent in homeport, a decrease of 6 months will result in E-5s having, on average, one less deployment (reducing months deployed by 6). For E-6 through E-9 Seabees, the number of months deployed will be reduced by 3 months under the first scenario and 2 months under the second scenario. The different estimates by rank category suggest that sea tour deployments have a significant impact on the perceived arduousness of sea tours.

We can also think of these estimates in the following way: What monthly gain or loss is perceived by a change in sea tour length? For the full sample, we estimate that a change in sea tour length of about half a year is worth as much as $496 to the typical respondent, or a monthly gain of $83 for each of those 6 months. For the E-5 subsample, a 1-month decrease in sea tour length is valued, on average, at $103.

Deployment Location Preference

- The order of preference for primary deployment location is:
  - Rota, Spain
  - Guam
  - Okinawa, Japan
- True for full sample and all subsamples

We now focus on deployments, the main distinguishing feature of sea tours, first by examining preference ranking for deployment locations. We could not include all Seabee deployment locations in the survey and still have precise estimation, so we chose three primary deployment locations: Rota, Guam, and Okinawa. In the survey instructions, primary deployment location was defined as follows: "During this sea tour you will deploy to more than one site, but the majority of your deployments are at or through this location." For all samples analyzed, the preference for deployment location was Rota, followed by Guam, then Okinawa. If asked to choose between three assignment sea duty packages that differed only by deployment location, we estimate that the largest number of Seabees would choose the Rota, Spain, package.

How Attractive Are the Deployment Locations?

Deployment location	Full sample estimates	Rank subsamples estimates			NMCB unit subsample estimates	
		E-1 to E-4	E-5	E-6 to E-9	Port Hueneme, CA	Gulfport, MS
Rota vs. Guam	$461	$624	$321	$370	$550	$651
Rota vs. Okinawa	$932	$893	$930	$1,083	$1,024	$1,282
Guam vs. Okinawa	$483	$283	$617	$723	$501	$648

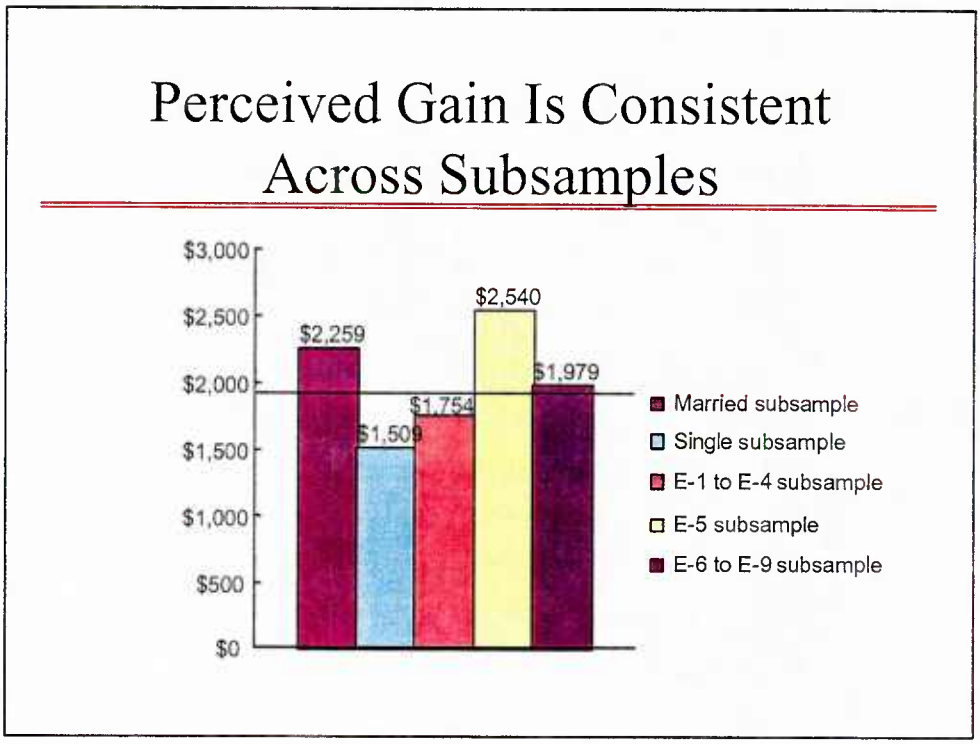
The order of preference for primary deployment location was the same for each subsample, but the strength of preference differed. In this slide, we show for different samples the amount of money that would have to be included in an assignment package with a less preferred deployment location to make the typical respondent as likely to choose that assignment as one with a more preferred location. In the first column of the table, the first deployment location listed is the more preferred. The amount of compensating differential is highest when looking at Rota, Spain, versus Okinawa, Japan, the most and least preferred deployment locations.

For the full sample, we estimate that a $461 sea duty assignment special pay attached to an assignment that deployed through or to Guam would be chosen by as many of the respondents as an assignment, without any sea duty assignment pay, that deployed to or through Rota. The estimates for the Gulfport, MS, subsample are greater than the estimates for the Port Hueneme, CA, subsample. This implies that Seabees at Gulfport NMCBs dislike deploying to or through Okinawa more, which may be a reflection of some sorting to homeport by taste for deployment location and/or a taste for going to familiar deployment locations multiple times (assuming that sea tour Seabee units at Gulfport deploy more often to Atlantic-based locations and that Seabee units at Port Hueneme deploy more often to Pacific-based locations).

What Was Gained by the Recent Deployment Cycle Change?

- Current rotation cycle of 6 months deployed and 10 months at home is preferred to previous 7-7 cycle
- For full sample, it would take **$1,953** per sea duty assignment to make the "typical" respondent just as likely to choose an assignment with a 6-10 cycle as an assignment with a 7-7 cycle

The deployment rotation cycle changed in 2002 from 7-7 to 6-10, that is, 6 months deployed and 10 months in homeport. To a majority of respondents, the 6-10 rotation cycle is more attractive than the 7-7 cycle. Holding all else equal, if allowed to choose between two packages that differed only by deployment cycle, we estimate that twice as many respondents would select the 6-10 package. To make the two packages equally attractive to the "typical" respondent, we estimate that $1,953 per tour, or $42 per month, would have to be attached to the package with a 7-7 rotation cycle. The preference for fewer months spent deployed suggests that sea duty deployments are considered onerous.



This figure shows for different samples the estimated amount of money that would make an equal number of respondents choose a package with a 6-10 rotation cycle as one with a 7-7 rotation cycle with money attached. As a reference point, the horizontal line represents the level of compensation calculated for the entire sample ($1,953).

The change in rotation cycle reduced the amount of time spent away from home. Thus, it is not surprising that, on average, married Seabees valued the change more than single Seabees.

The results for the rank categories are highest for the E-5, followed by the E-6 through E-9 and then the E-1 through E-4 subsample. This is also the order of largest decreases in average number of months spent deployed for these groups. The reason for this difference is that each of these groups has different average sea tour lengths, so any change in the sea tour rotation cycle will affect the number of months that are spent deployed. On average, E-5s spend 48 months in a sea tour; for that length of tour, the rotation cycle change resulted in a 9-month decrease in deployment months, or a 33-percent decrease in total deployed time per sea tour. For E-6s through E-9s who spend the average amount of time on a sea tour, 36 months, the rotation change would have decreased deployments by 6 months. The E-1s to E-4s spend the most time on sea duty, 58 months, but would have benefited the least from the rotation cycle change, a 4-month decrease in time spent deployed during a sea tour.

Compensation for Perceived Sea Tour Duty and Deployment Hardship

		Amount per month
Sea tour pay "fix"		*$75*
Compensating the perceived hardship of a sea tour month	E-1 through E-4	$102
	E-5	$103
	E-6 through E-9	$57
Sea deployment pay "fix"		*$195*
Compensating the perceived hardship of a sea deployment	E-1 through E-4	$439
	E-5	$282
	E-6 through E-9	$330

Unlike other Navy communities, the Seabee community receives no sea pay and little deployment related compensation. The recent expansion in sea pay will increase other communities' pay relative to Seabees, which may have a negative impact on Seabee manning. To address this issue, previous CNA research determined the amount of compensation that was warranted based on recent sea pay increases.[2] The amount of Seabee pay "fix" is equivalent to the increase in recent sea pay, to counteract any negative retention and manning consequences. We present, in italics, the Seabee pay fix amounts as deployment and sea tour pay, along with the estimates we calculated from answers to the CBC survey questions. The estimated compensation amounts are based on survey respondents' perceived hardship of a change in sea tour length and deployment rotation cycle.

To calculate the sea tour compensation, we used the estimate of the perceived value of a 6-month sea tour decrease for the typical respondent divided by 6 months to get an average hardship per month of sea tour. The sea tour pay fix falls between our compensation estimate for E-6 to E-9 and other ranks. Thus, the sea pay fix is a reasonable estimate of what level of compensation is necessary to address the perceived hardship over the length of a sea tour.

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[2] Anita Hattiangadi, Henry Griffis, and David Gregory, *"Can Do No More?" An Assessment of Seabee Compensation,* May 2002 (CNA Research Memorandum D0005212.A1).

To calculate the amount that would compensate for the perceived hardship of having an additional month of deployment, we divided our estimate of what was gained from switching from the 7-7 rotational cycle to the 6-10 rotational cycle by the average decrease in deployment months from the rotation cycle change. This estimate would compensate the typical respondent for having a sea tour assignment with an additional month of deployment. The deployment pay fix is a lower bound based on maintaining the status quo in terms of the compensation differential between Seabee and their other Navy counterparts, whereas this document's estimates reflect compensating for the entire perceived hardship of Seabee deployments.

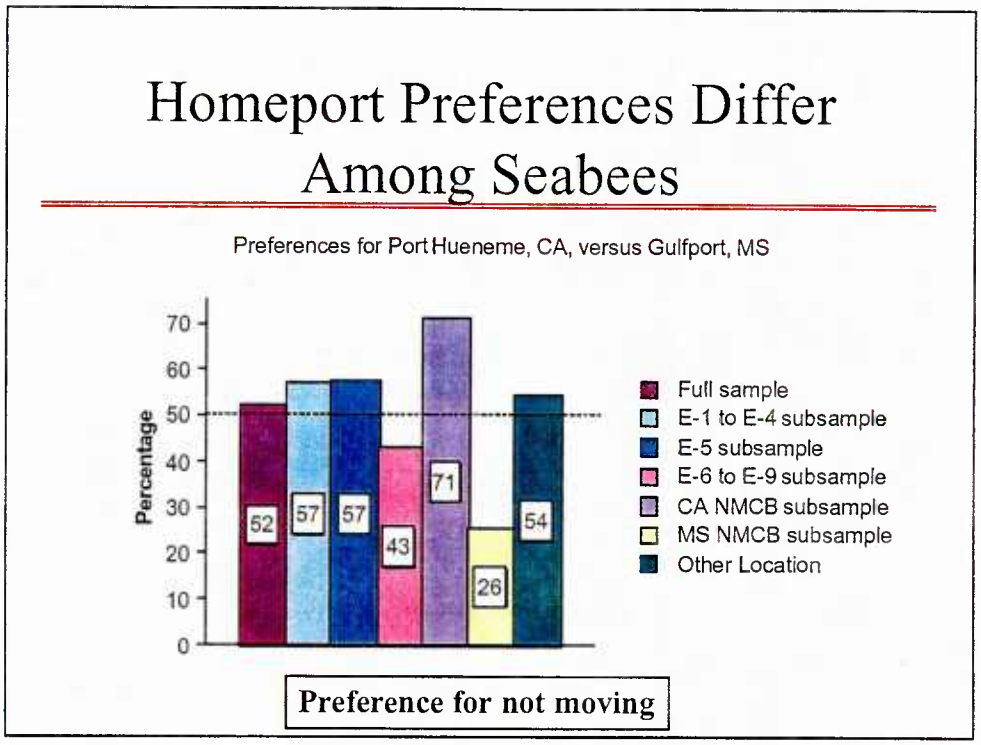
The Seabee $4.3-million pay fix presented in previous CNA research is a justifiable first step at addressing the issue that Seabees are not compensated for an arduous job.

Cost of Compensating Perceived Hardship

		Using rank category estimates	Using full sample estimate
Annual cost of compensating perceived sea tour hardship	E-1 to E-4	$3.8 million	$3.1 million
	E-5	$1.3 million	$1.0 million
	E-6 to E-9	$0.7 million	$1.0 million
	Total	**$5.8 million**	**$5.2 million**
Annual cost of compensating perceived deployment hardship	E-1 to E-4	$7.2 million	$8.0 million
	E-5	$1.3 million	$1.0 million
	E-6 to E-9	$1.7 million	$3.4 million
	Total	**$10.2 million**	**$12.4 million**

Compare with pay "fix" of $4.3 million annually

These rough estimates are based on how much value is placed on reducing a sea tour or deployment by 1 month. In total, the rough estimates are larger than the pay "fix" estimate of $4.3 million. This is not surprising because the monthly pay fix was sized to offset retention and manning trends, whereas our survey estimates are sized to fully compensate for all the perceived negatives of sea duty. Our rough estimates suggest that deployments are one of the most arduous aspects of sea tour, if not the most arduous. Because deployments are arduous, fully compensating for deployments is also more expensive. Although any special pay ought to be targeted at addressing this hardship, there will be limits to how much total compensation can be spent. However, these rough estimates indicate that targeting pay that fully compensates for the perceived hardship to E-5s and above is reasonable. In other words, the pay fix of $195 for each month of deployment, for all Seabees, is a reasonable first step to addressing this issue.



We now turn to the issue of homeport preference. This slide indicates the predicted percentage of Seabees who would choose a Port Hueneme sea tour assignment if the other option was a sea duty assignment with a homeport of Gulfport. The horizontal line indicates the 50-percent level, where an equal number of respondents would choose either package. The estimates are aggregate results for the sample, so to gather information on the preferences of a more precise group we also looked at specific subsamples.

For the full sample, we estimate that 52 percent would choose a sea duty assignment in Port Hueneme. So, if offered two packages that differed only by homeport location, we estimate that an equal number of Seabees would choose either package. In general, Seabees don't seem to perceive a significant hardship from homeporting at either location. However, as we discuss later, Seabees do seem to have a preference for having multiple sea tours at the same location, which implies a preference for homebasing.

To get more of an indication of how homeport preferences vary with personal characteristics, we calculated preferences by rank category and current location for Seabees currently at an NMCB.

We find a strong preference among the E-5 subsample to stay in Port Hueneme, most likely because of the sample composition. Of the E-5 subsample, 29 percent were currently at a Port Hueneme NMCB, whereas 18 percent were at a Gulfport NMCB. Because a larger percentage was in California, it is not surprising that Mississippi was a less attractive homeport location. These Seabees may have already sorted themselves to a location they prefer and/or they have a preference to stay at the same location for multiple tours.

Holding all else constant, we estimate that 57 percent of those E-6 to E-9 Seabees who responded to the survey would pick a Gulfport assignment instead of an assignment at Port Hueneme. This indicates a strong preference among the E-6 to E-9 subsample to stay in Gulfport, MS. In the case of E-6s to E-9s, the preference does not seem to be the result of current location because almost an equal percentage of the E-6 to E-9 subsample was at either NMCB location.

Sailors who are currently at Port Hueneme are interested in continuing there for another tour.[3] For Seabees currently at an NMCB in Gulfport, we estimate that, if offered the chance to select their next sea duty assignment, 74 percent would prefer a return to Gulfport, MS. Our findings show that, in general, NMCB Seabees would prefer their next sea duty assignment to be at the location of their current sea duty assignment homeport. This may be because they are familiar with that unit and the type of deployment and work. It also suggests that Seabees have a preference for staying at their current location, for more than one tour. Our findings also show that neither location is particularly less preferred to the point that a nontargeted assignment location pay is warranted.

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[3]To protect the identity of respondents, the question on current unit location was restricted to Gulfport NMCB, Port Hueneme NMCB, and all other locations.

Homeport Location and Monetary Tradeoffs

- How much money would it take to make the "typical" respondent just as happy at a less preferred location?
  - Port Hueneme is less preferred location
    - E-6 to E-9 subsample: $1,004
    - MS NMCB subsample: $3,694
  - Gulfport is less preferred location
    - Full sample: $295
    - E-1 to E-4 subsample: $718
    - E-5 subsample: $1,029
    - CA NMCB subsample: $1,966

To provide a relative value for homeports, we estimated how much sea duty tour special pay would be needed to make an estimated 50 percent of respondents choose either homeport. These estimates are for the entire sea tour length, so for the E-6 to E-8 subsample, the monthly special pay amount would be $27.

How much a specific homeport is preferred will determine the level of compensating differential. For respondents at Gulfport NMCBs to choose Port Hueneme and Gulfport at the same rate, the assignment would have to have an attached special pay of $3,694 per tour. In contrast, to make Port Heuneme NMCB respondents choose Gulfport and Port Hueneme at the same rate, the estimated special pay is only $1,966. The difference between the two estimates indicates that respondents in MS have a stronger preference to spend multiple sea tours at the same location.

Homeport Preference by Marital Status

- How much would it take the "typical" respondent to be just as happy at Gulfport, MS, a less preferred location?
  - Full single subsample: $93
  - Single at CA NMCB subsample: $1,795
  - Full married subsample: $580
  - **Married at CA NMCB subsample: $2,163**

As mentioned earlier, we found that Sailors at NMCB units overall have a preference for having their next sea duty assignment at their current sea duty location. This suggests a preference to stay at the same location for numerous tours, which previous CNA research has found to be related to marital status.[3] For that reason, we looked at married and single subsamples.

For the full single and married samples, we found that Port Hueneme is the preferred location, more so for the married subsample than the single subsample. The location preference may be reflecting sample composition. For example, 42 percent of single respondents were located at an NMCB at Port Hueneme, compared with 31 percent at Gulfport. For the married sample, 19 percent were currently at a Gulfport NMCB and 25 percent were currently at a Port Hueneme NMCB.

To address this issue of sample composition, we further split the sample into single and married by current location. Though we have information on Seabees at MS and CA NMCBs, we focus on the CA NMCB subsample by marital status.

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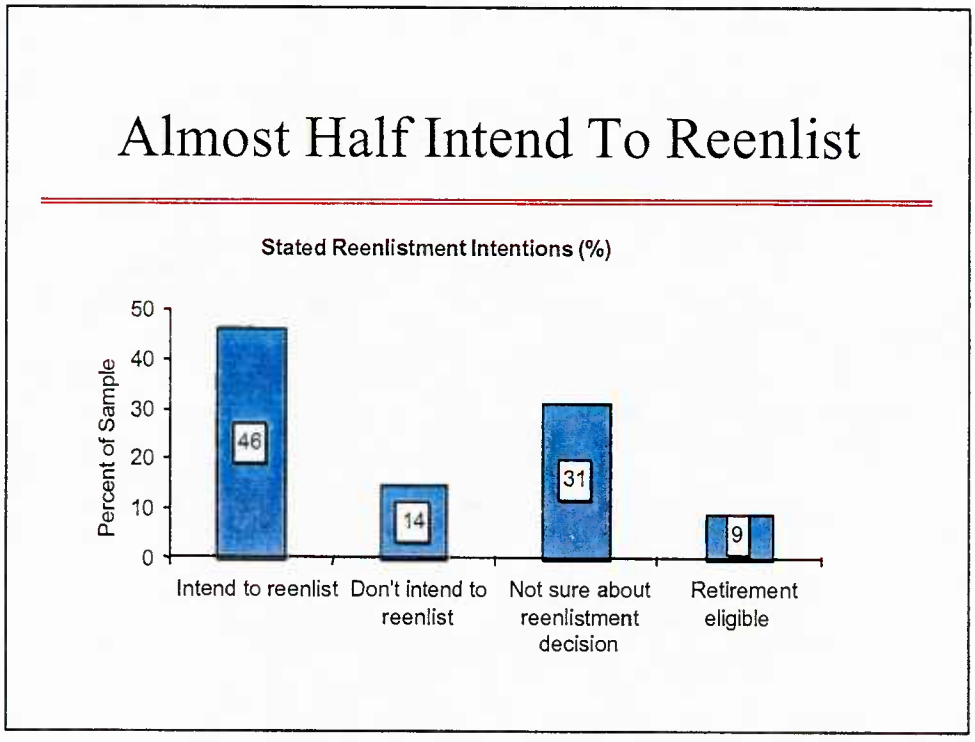
[3]Peggy Golfin, James Gasch, and Henry Griffis, *Homesteading/Homebasing: A Current Look and Some Ideas for the Future*, Jun 1996 (CNA Annotated Briefing 96-54).

Looking at the Port Hueneme subsample, we find that a majority of Seabees prefer to have multiple sea tours at the same location. This preference may result from (1) location sorting that has already occurred, in that Sailors have self-selected to assignments at locations they prefer, which would reveal itself in a preference to go to that location for another sea duty assignment, and/or (2) a preference to settle down at a location, to purchase a home, allow one's spouse to stay at the same job for long periods of time, or keep children in the same school. In aggregate, married Seabee Sailors have more of a preference than single Seabee Sailors to stay at their current sea duty location for their next sea duty location.

The results for the Gulfport sample reflect a pattern similar to the CA NMCB subsample; however, the numbers are not reported because of lack of precision from small sample size.



The last section of this briefing focuses on the effect of different sea duty compensation or characteristics on estimated stated reenlistment intention. In this slide, we report survey respondents' answers to a direct question: "Do you plan to reenlist at the end of your obligation?" All respondents were asked this question, and 552 respondents (or 46 percent) of the sample stated an intention to reenlist, which is 32 percentage points higher than the percentage who stated that they don't intend to reenlist. A small share of the sample, 9 percent, is eligible for retirement and plan to retire.

Almost a third stated that they were unsure about what their next reenlistment decision would be. Although we would expect some respondents to be unsure about their next reenlistment decision, 31 percent of the sample seemed high. Possible reasons for why 375 respondents stated they were unsure include not feeling comfortable listing an intention not to reenlist and the fact that EAOS is a long way off.

How Sea Tour Characteristics Affect Estimated Reenlistment

Scenario	Predicted probability of choosing an assignment option (%)	Change in predicted probability (%)
Base case	60	—
Case 1: $2,000 pay	76	26
Case 2: $3,200 pay	81	36
Case 3: $5,800 pay	88	47
Case 4: 6-month sea tour decrease	64	7
Case 5: 6-month sea tour increase	50	-16
Case 6: 12-month sea tour increase	45	-25
Case 7: 7-7 deployment cycle	44	-26

These estimates compare a base case scenario, shown in appendix F, that represents current sea tour assignment options with alternative scenarios that represent different policy options. Cases 1 through 7 are alternative scenarios that differ from the base case by only the indicated level.

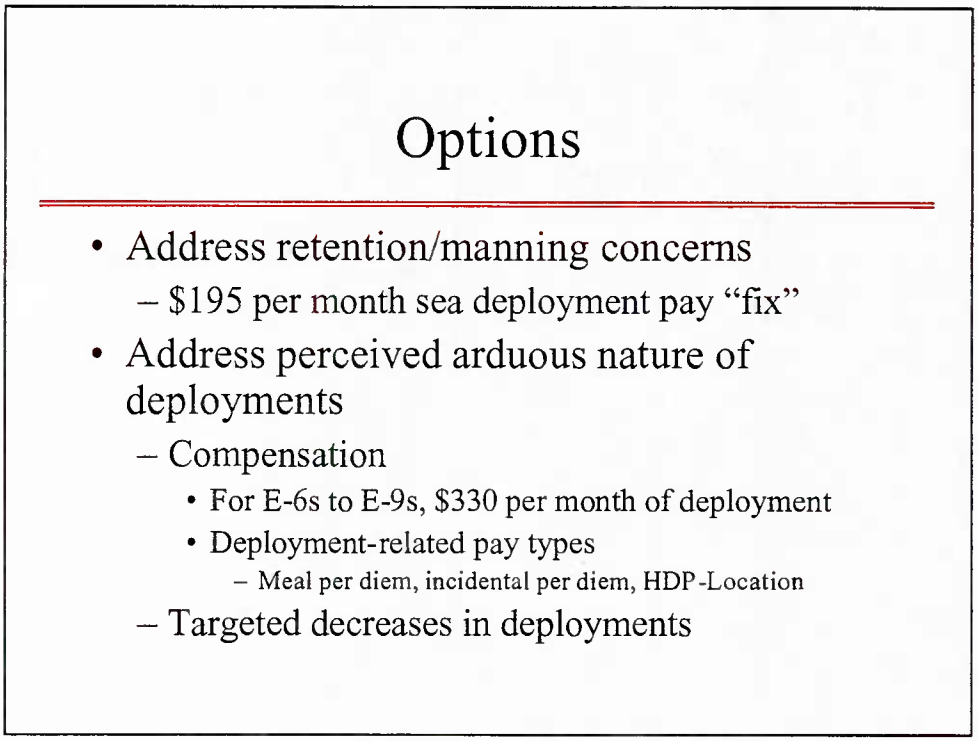
To estimate the impact of these changes in assignment packages on enlistment propensity, we estimate the probability that an assignment option would not be chosen, if the None option were chosen. The alternative scenarios are intended to represent specific policy alternatives NAVFAC may be interested in evaluating. This is an indication of how much the reenlistment decision is influenced by changes in compensation or quality-of-service aspects. We find that the sea tour special pay has the greatest impact on the likelihood of picking an assignment option.

Actual Versus Survey Estimated Reenlistment Rates

Rank category	Actual FY02 reenlistment level	Survey stated reenlistment intentions	Survey estimated reenlistment intentions
E-1 through E-4	64 percent	29 percent	50 percent
E-5	73 percent	58 percent	61 percent
E-6 through E-9	69 percent	56 percent	70 percent

The survey estimated reenlistment intentions from CBC survey data fall between the survey stated reenlistment intentions and the actual reenlistment levels for FY02. The estimates for the E-6 to E-9 rank category are almost the same, off by 1 percentage point.

The stated reenlistment intention may be lower because respondents were offered the option to indicate that they were unsure about what their next reenlistment decision would be and if they planned to retire. For the E-1 through E-4 sample, 44 percent indicated that they were unsure. For the E-5 sample, 30 percent indicated that they were unsure about reenlistment. For the E-6 through E-9 sample, 17 percent indicated that they were unsure about their next reenlistment decision.



To address the perceived arduous nature of sea tour deployments, we estimate a monthly compensation of $439 for E-1s to E-4s, $282 for E-5s, and $330 for E-6s to E-9s. All of these estimates are larger, so more expensive, than the estimate of $195 calculated in previous CNA research. So, $195 is a first step in addressing what is a perceived cost to deploying versus not deploying an additional month.

Alternative noncompensation policies include targeted decreases in the number of months spent in sea duty or number of total deployments. However, these options would have manning implications that also have associated costs.

Options (cont'd)

- Address preference to stay in same location
  - Accommodate Seabees to stay in same area for more than one tour
  - Compensate Seabees for relocating
    - Seabees perceive relocating as at least a $2,000- to $4,000-per-tour "cost"

The preference to have sea tours in the same area for multiple tours implies that there is a cost of relocating to Sailors. This perceived cost is a minimum of $2,000 to $4,000 per tour.

Appendix A

Acknowledgment

This analysis would not have been possible without the cooperation and support received of the following Seabee units:

CBU 401
CBU 402
CBU 403
CBU 405
CBU 406
CBU 410
CBU 411
CBU 412
CBU 413
CBU 414
CBU 415
CBU 416
CBU 417
CBU 418
CBU 420
CBU 421
CBU 422
CBU 423
CBU 427
UCT 1
ACB 1
ACB 2
NMCB 1
NMCB 3
NMCB 4
NMCB 5
NMCB 40
NMCB 74
NMCB 133
NAVCONSTRACEN-MS
NAVCONSTRACEN-CA
NCR 20
NCR 31

Appendix B

Survey Items

Assignment Package Characteristics

Each survey included the following information:

Homeport

Homeport received during the sea tour.

Total Extra Special Pay Received During the Sea Tour

The total amount of special pay received during this sea tour. This would be in addition to all pays currently received. It would be received in equal amounts during the sea duty assignment.

Sea Tour Length

A possible reduction or increase in expected sea tour length. Assume the expected sea tour length is the length of your current sea tour or your next sea tour.

Primary Deployment Location

During this sea tour, you will deploy to more than one site, but the majority of your deployments are at or through this location.

Deployment Cycle

The rotation rate between months deployed and months in homeport.

The survey also included the following information, which is the average sea tour length by paygrade:

Paygrade	Sea Tour Length
E-1	54 months
E-2	54 months
E-3	54 months
E-4	54 months
E-5	48 months
E-6	36 months
E-7	36 months
E-8	36 months
E-9	36 months

Package Characteristics

Homeport	Port Hueneme, CA	Gulfport, MS		
Total extra special pay received during the sea tour	$0	$2,000 extra special pay for the sea tour	$3,200 extra special pay for the sea tour	$5,800 extra special pay for the sea tour
Change in expected sea tour length	12-month increase	6-month increase	No change	6-month decrease
Primary deployment location	Okinawa, Japan	Rota, Spain	Guam	
Deployment cycle	6 months deployed, 10 months in homeport	7 months deployed, 7 months in homeport		

This table lists all CBC question levels. Each respondent saw different package combinations from the above list. The first column of this slide lists the package characteristics that made up the CBC assignment packages, followed by all the levels of that characteristic.

Appendix C

Survey Sample Count and Summary Statistics

Survey Summary Statistics

Category	Survey Sample Frequency	Survey Sample (%)	June 2002 Enlisted Master Records: Seabee Population (%)
18 to 21 years old	181	15.03	21.04
22 to 25 years old	317	26.33	26.06
26 to 30 years old	237	19.68	18.48
31 to 35 years old	205	17.03	15.48
36 to 40 years old	196	16.28	13.3
41 to 45 years old	55	4.57	4.41
46 to 50 years old	13	1.08	1.01
51 to 60 years old	0	0	0.20
Married	713	59.22	46.53
Single	491	40.78	53.47
E-1 to E-4	470	39.04	46.57
E-5	327	27.16	24.77
E-6 to E-9	407	33.80	28.66
Builder	339	28.16	28.07
Construction Electrician	144	11.96	13.57
Construction Mechanic	179	14.87	17.05
Engineering Aide	46	3.82	3.94
Equipment Operator	163	13.54	16.37
Steelworker	117	9.72	9.43
Utilitiesman	106	8.80	10.48
Other	110	9.14	1.09
Currently at NMCB Unit, Gulfport, MS	288	23.92	23.60
Currently at NMCB Unit, Port Hueneme, CA	384	31.89	23.55
NCTC "A" School Student	15	1.25	—
Other Location	517	42.94	52.85

Assignment Considerations

	Percentage
Of the package characteristics you just saw, which were the most important in your decision process?	
Homeport	35.80
Total extra special pay received during the sea tour	33.39
Change in expected sea tour length	10.47
Primary deployment location	6.81
Deployment cycle	13.54
What do you least like about deployments?	
Time spent away from home and/or family	60.38
Work schedule	7.23
Work environment (facilities, tools, etc.)	12.46
Availability of deployment site's local recreational activities, restaurants, etc.	4.49
Other	9.30
Not applicable	6.15
In general which of the following is the most important to you in the assignment process?	
Spouse's employment opportunities	11.05
Being near other family members (siblings, parents, etc.)	17.69
Permanent residence/immediate family close to job	15.12
Navy career-enhancing move	16.86
Type of work	9.97
Cost of living	9.72
Climate and/or exotic locale	5.73
Quality and quantity of local educational facilities	4.07
None of the above	9.80

Appendix D

Survey Methodology

Survey Methodology

CBC analysis builds on two fundamental assumptions. The first is that products, or assignments, are defined by a whole set of characteristics rather than just one characteristic. The second is that people implicitly evaluate the total worth of the product by combining the amounts of utility value provided by each characteristic individually.

We assume that respondents will choose one package over another if the amount of utility or perceived utility from that package is greater than that from all other packages. Utility is the unobservable value or benefit perceived by the respondent. For each package, the value to the respondent will depend on the assignment characteristic levels of the package.

If presented with three packages, i, j, and k, a Sailor will choose the assignment package that has the most preferred combination of package levels. So package i would be chosen if the utility from package i was greater than the utility from package j or k:

$$(U(p_i) > U(p_j) and U(p_i) > U(p_k)).$$

With the CBC data, we know which packages were offered and which of the three packages were chosen. But not all potential packages are seen by all respondents, so we are interested in estimating the impact of the package levels on an estimated probability of a particular package being chosen. To estimate the value of the package levels, we use a conditional logit model.

Conditional Logit

The first step in predicting the market performance of a given product is to estimate the utility values of the individual product attributes. In this study, we estimate the characteristics' utilities from the survey data using a conditional logit model.

The conditional logit model is a discrete choice model that estimates the probability of choosing one alternative, in this case a package, from a set of alternatives, conditional on certain factors. The behavior of interest, or the dependent variable, is characterized by a discrete variable. In this case, the dependent variable is whether the assignment was picked by the respondent. The conditional logit model is different from other discrete choice models because, rather than estimating the effects of respondents' characteristics on the choices individuals make, it estimates the effects of characteristics of the choices themselves. In this case, we examine the impact of the different homeport, deployment locations, and incentive levels on the probability that a package is chosen.

Respondents consider choosing alternative x_i from a well-defined set of package alternatives where each package is defined by K attributes. Alternative x_i includes all assignment characteristics included in that package. According to the conditional logit model, the probability that alternative x_i will be chosen is:

$$prob(x_i) = \frac{\exp(\beta' x_i)}{\sum_i \exp(\beta' x_i).}$$

In this notation, x_i and â are vectors with K elements that correspond to the K attributes of the product. The â vector measures the impact of each attribute of x on the probability that x_i will be chosen.

To estimate the model, each response was considered an observation and weighted the same.

Estimated Utility of Products

The second step is to calculate the individual characteristic utilities to come up with a measure of the total worth of a product. Given the structure of the logit model, people are assumed to simply add the individual characteristic's utilities to determine the total utility of a product. Using these utilities, we calculated the tradeoff between package characteristics to get an estimated relative probability of preference between the attributes.

We assume that people evaluate the overall attractiveness of a choice by summing the utilities associated with each of the attributes of the choice. For a given package, the amount of benefit from the package equals the benefit received from the sum of the parts. In this case, the utility from a specific package is based on the utility derived from the individual package items. Under this assumption, the overall utility of choice x_i is a linear function of the attributes of x_i, calculated by the conditional logit model:

$$U_i = \sum_k B_k x_{ik}.$$

Share-of-Preference Simulation

The conditional logit model estimates the probability that a given alternative x will be chosen conditional on the attributes of x_i, and serves as the basis for the share of preference model used in this study.

Using this model, simulations are done in the following way. First, a set of hypothetical products is defined using different combinations of the attribute levels. Then, the total utilities of all the products in the set are calculated using the utility values that are estimated by the conditional logit regression. These values are then used to generate shares of preference or predicted probabilities of choice for each product. The preference share model is a logit transformation of the calculated utilities per package level. For example, if we are determining the preference share between Product A and Product B, the product's preference share would be calculated as:

$$P(A) = \frac{\exp(U_A)}{\exp(U_A) + \exp(U_B)}.$$

This assumption is based on the fact that the main model is not distinguishing between individual respondents. The model is assuming homogeneity among respondents. If the probability of choosing a package is estimated as 50 percent, this does not mean that 50 percent of the population would necessarily pick that package, but that an estimated 50 percent of survey respondents would most likely choose that package. The model estimates a preference share among the packages provided. Because the model is aggregated and isn't taking into consideration all aspects of an assignment package, the shares cannot be interpreted as market shares. However, we are interpreting the estimates as preference shares that indicate respondents' relative preference for packages. If we are interested in the "typical" respondent, we would be interested in those packages with 50-percent preference shares. This allows us to calculate the incentive levels that make these packages essentially equivalent for the typical respondent.

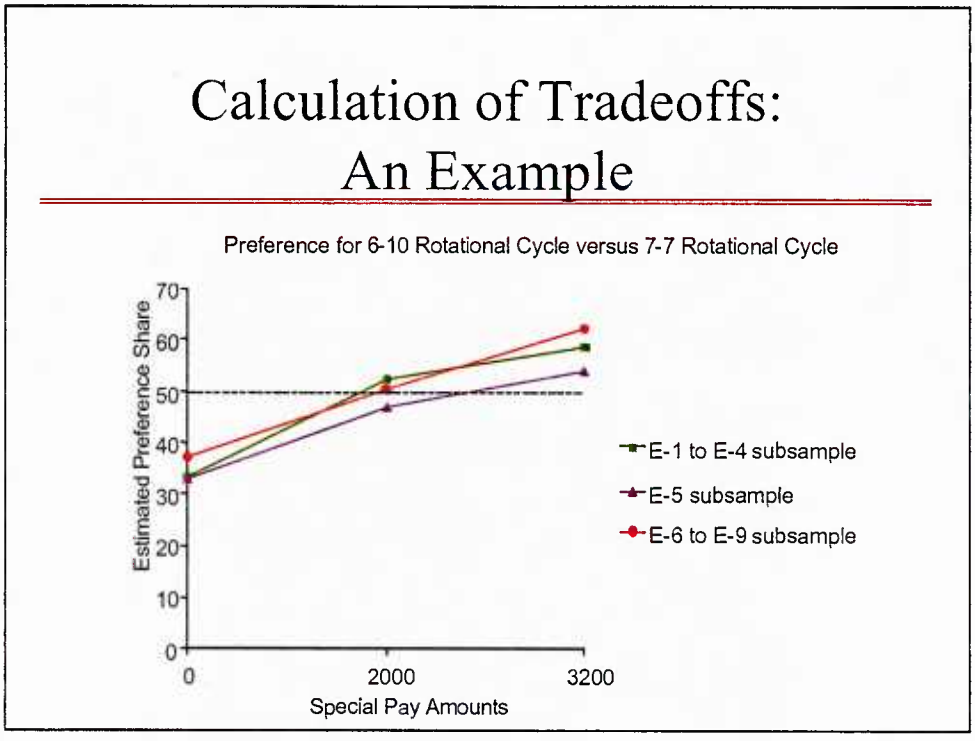
Example of Preference Share Calculation: Main Effects Model

Assignment package #1		Assignment package #2	
Characteristic level	Logit-estimated utility	Characteristic level	Logit-estimated utility
Gulfport, MS	-0.0299	Port Hueneme, CA	0.0299
7-7 Rotation	-0.3196	6-10 Rotation	0.3196
$2,000	-0.115	$3,200	0.235
Total package value-Ui	-0.4645	Total package value-Ui	0.5845
Exp (Ui)	0.628	Exp (Ui)	1.79
Predicted probabilities of choice	**26%**	Predicted probabilities of choice	**74%**

This is an example of the share-of-preference model to show how the logit estimates are used to calculate the predicted probabilities of choice. The first four rows describe two potential assignment packages. The logit estimates for each of the levels is indicated. To determine the total utility from each package, the logit estimates are summed. The next step is to take the exponential of the total product values for both products in the simulation scenario. For package #2, the exponential sum of the utilities yields a predicted preference share of 74 percent.

The estimates in this table are from the main effects logit estimates, using all tasks from all completed surveys. This example is for clarification purposes only. Throughout this annotated briefing, we use a variation of the main effects model that requires a slightly more complicated calculation of the shares of preference. The interaction effects model used includes, along with all package levels, interactions between special pay and sea tour length, and homeport and deployment location.

Calculation of Tradeoffs: An Example



This graph illustrates how we calculated the nonmonetary tradeoffs with compensation. It shows the estimated percentage of respondents who would choose the 7-7 rotation package with different compensation attached, if the alternative was a package without any compensation and a 6-10 rotation cycle. The dashed line indicates that level at which just as many respondents would choose either package from a linear interpolation. Because the 6-10 rotational cycle is preferred more by the E-5 subsample, the amount of money attached to the 7-7 package is higher for those respondents than for the other subsamples.

Appendix E

Logit Estimates

Two Logit Models

- Main effects model
  - Includes all five package characteristics with no interactions between characteristics
- Interaction model
  - In addition to main effects:
    - Interacted homeport location and deployment
    - Interacted sea tour length and money received during the sea tour
  - Used for all estimates

Logit Estimates: Full Sample Main Effects Model

Attribute level	Effect (std. error)
Gulfport, MS	-0.03 (0.009)
Port Huememe, CA	0.03 (0.009)
No extra special pay	-0.835 (0.020)
$2,000 extra special pay	-0.115 (0.017)
$3,200 extra special pay	0.235 (0.016)
$5,800 extra special pay	0.715 (0.015)
6-month decrease in expected sea tour length	0.321 (0.016)
No change in expected sea tour length	0.225 (0.016)
6-month increase in expected sea tour length	-0.071 (0.017)
12-month increase in expected sea tour length	-0.475 (0.018)
Rota, Spain	0.170 (0.012)
Okinawa, Japan	-0.162 (0.013)
7 months deployed, 7 months in homeport	-0.320 (0.010)
6 months deployed, 10 months in homeport	0.320 (0.009)
NONE	-0.147 (0.019)

Logit Estimates: Full Sample Main and Interaction Effects Model

Estimates used for Annotated Briefing

Attribute Level	Effect (std. error)
Gulfport, MS	-0.030 (0.009)
Port Huememe, CA	0.030 (0.009)
No extra special pay	-0.836 (0.021)
$2,000 extra special pay	-0.114 (0.017)
$3,200 extra special pay	0.235 (0.016)
$5,800 extra special pay	0.715 (0.015)
6-month decrease in expected sea tour length	0.328 (0.016)
No change in expected sea tour length	0.222 (0.017)
6-month increase in expected sea tour length	-0.086 (0.018)
12-month increase in expected sea tour length	-0.464 (0.019)
Rota, Spain	0.169 (0.012)
Okinawa, Japan	-0.161 (0.013)
Guam	-0.008 (0.013)
7 months deployed, 7 months in homeport	-0.320 (0.009)
6 months deployed, 10 months in homeport	0.320 (0.009)
Gulfport, MS, by Rota, Spain	-0.018 (0.014)
Gulfport, MS, by Guam	0.010 (0.015)
Gulfport, MS, by Okinawa	0.008 (0.015)
Port Hueneme, CA, by Rota	0.018 (0.014)
Port Hueneme, CA, by Okinawa	-0.008 (0.015)
Port Hueneme, CA, by Guam	-0.010 (0.015)
No extra pay by 6-mo decrease in expected sea tour	0.059 (0.034)
No extra pay by no change in sea tour	-0.014 (0.036)
No extra pay by 6-mo increase in expected sea tour	-0.101 (0.039)
No extra pay by 12-mo increase in expected sea tour	0.057 (0.042)

Logit Estimates: Full Sample Main and Interaction Effects Model (con't)

Estimates used for Annotated Briefing

Attribute Level	Effect (std. error)
$2,000 pay by 6-mo decrease in expected sea tour	-0.008 (0.030)
$2,000 pay by no change in sea tour	-0.001 (0.031)
$2,000 pay by 6-mo increase in expected sea tour	0.014 (0.032)
$2,000 pay by 12-mo increase in expected sea tour	-0.004 (0.035)
$3,200 pay by 6-mo decrease in expected sea tour	-0.022 (0.029)
$3,200 pay by no change in sea tour	-0.008 (0.029)
$3,200 pay by 6-mo increase in expected sea tour	0.061 (0.030)
$3,200 pay by 12-mo increase in expected sea tour	-0.031 (0.033)
$5,800 pay by 6-mo decrease in expected sea tour	-0.028 (0.028)
$5,800 pay by no change in sea tour	0.023 (0.028)
$5,800 pay by 6-mo increase in expected sea tour	0.027 (0.029)
$5,800 pay by 12-mo increase in expected sea tour	-0.022 (0.031)
None	-0.147 (0.019)

Appendix F

Estimate of Reenlistment Probability

Base-Case Scenarios

Base-Case Simulation Scenarios

Base Case	Homeport	Extra Special Pay	Change in Expected Sea Tour Length	Primary Deployment Location	Deployment Cycle
Package 1	Gulfport, MS	No extra special pay	No change	Okinawa, Japan	6-10 cycle
Package 2	Port Hueneme, CA	No extra special pay	No change	Guam	6-10 cycle
Package 3	Gulfport, MS	No extra special pay	No change	Rota, Spain	6-10 cycle
None Option					

The base case includes three assignment packages and a "none" option because the share of respondents predicted to choose "none" will be correct only if the number of hypothetical sea duty packages is the same as the number of packages respondents saw in the survey.

The base-case scenario reflects current conditions; therefore, the base-case package varies only in terms of homeport and deployment location characteristics that currently vary by assignment. The policy changes of special pay, sea tour length, and deployment cycle are the same in each package and are set to current levels.

Appendix G

Internal Consistency and Potential Bias

Internal Consistency: Example 1

Of the 18 CBC questions respondents saw, 2 were "fixed," or the same for all respondents. We calculated this annotated briefing's results using data from the 16 non-fixed tasks. However, having the fixed tasks allows us to evaluate the internal consistency of our model. The following two tables show the package options seen by all respondents, the actual share of respondents who selected each package and predicted shares based on calculations using the 16 non-fixed tasks. For both examples, the actual and predicted shares are close; however, the rank order of the packages differs between the actual and predicted shares. If we ignore the None option, Package 4, the actual and predicted share rank ordering is the same.

Package 1	Package 2	Package 3	Package 4
Gulfport, MS	Port Hueneme, CA	Gulfport, MS	None, I would prefer to either leave the Seabees or leave the Navy than serve a sea tour under these terms.
No extra special pay for the sea tour	$5,800 extra special pay for the sea tour	$3,200 extra special pay for the sea tour	
No change in expected sea tour length	12-month increase in expected sea tour length	6-month increase in expected sea tour length	
Rota, Spain	Okinawa, Japan	Guam	
6 months deployed, 10 months in homeport	7 months deployed, 7 months in homeport	6 months deployed, 10 months in homeport	
Actual Shares			
15.61%	**26.91%**	**37.54%**	**19.93%**
Predicted Shares			
19.11%	**20.51%**	**38.07%**	**22.31%**

Internal Consistency: Example 2

Package 1	Package 2	Package 3	Package 4
Port Hueneme, CA	Gulfport, MS	Port Hueneme, CA	None, I would prefer to either leave the Seabees or leave the Navy than serve a sea tour under these terms.
$5,800 extra special pay for the sea tour	$2,000 extra special pay for the sea tour	$3,200 extra special pay for the sea tour	
12-month increase in expected sea tour length	6-month decrease in expected sea tour length	6-month increase in expected sea tour length	
Guam	Rota, Spain	Okinawa, Japan	
7 months deployed, 7 months in homeport	6 months deployed, 10 months in homeport	7 months deployed, 7 months in homeport	
Actual Shares			
21.18%	**51.08%**	**8.22%**	**19.52%**
Predicted Shares			
19.21%	**44.50%**	**16.17%**	**20.13%**

Survey Bias

A survey has selection bias if individuals, or groups of individuals, within the population frame have different probabilities of being a survey respondent. Selection bias has the potential of biasing the survey results. To the degree that Sailors' responses to the survey are correlated with who has chosen to participate in the survey, the survey results will be influenced by the selection of participants.

The Seabee survey has selection bias due to differences in the probability of participation. Participation in the survey may not have been consistent or random. All Seabee units were asked to participate, but not all units complied. This survey is in part estimating preferences for location, so the location of participating units will affect the results. In addition, some units had higher participation levels than others. To the degree that those units determined their level of participation and/or influenced who was made available to participate, the probability of participation varied across units and across Sailors. For example, some of the units asked to participate in the survey were also asked to provide a set number of volunteers. These units may have asked specific Sailors to take the survey. Our estimates should be considered within the framework of this fielding mechanism. If differences in the probability of participation are correlated with Sailors' responses, the survey results will reflect this bias.

In addition, our sample characteristics differ from the Seabee population, indicating that our estimates may not be generalized to the nonparticipating Seabee community. For example, estimates from the full sample overstate the preferences of married people, senior enlisted, and Seabees at NMCBs in Port Hueneme, CA. However, the subsample analysis does provide more precise estimates for different subpopulations.

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Seabee Assignment Tradeoffs

Diana S. Lien • Anita U. Hattiangadi

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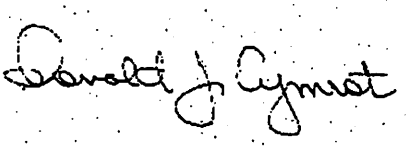

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14. ABSTRACT: The Commander of Naval Facilities Engineering Command (NAVFAC) asked CNA to determine what type of compensation would target any existing or impending shortfalls in Seabee retention and manning. Currently, the Seabee community receives no sea pay and little deployment-related pay. This annotated briefing presents analysis of data from the Seabee Quality-of-Service Compensation Survey, which collected data on enlisted Seabees' preferences for aspects of sea duty assignments. Our results suggest that sea duty deployments are the most arduous characteristic of a sea tour, and that most of the perceived benefit from a decrease in sea tour length or a shorter deployment rotation cycle is from corresponding decreases in deployed time. To address the perceived hardship of sea tour deployments, we estimate monthly compensations that are larger, or more expensive, than estimates calculated in a companion paper: "Can Do" No More? An Assessment of Seabee Compensation, May 2002 (CNA Research Memorandum D0005212.A2). This suggests that a monthly pay of about $200 during a sea tour is a first step in addressing Seabee dissatisfaction and manning and retention shortfalls.

15. SUBJECT TERMS: Seabees, compensation, survey, choice-based conjoint, deployment, sea pay

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